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ST. MICHAEL SLAYING THE DRAGON, AFTER RAPHAEL.

"Truth must triumph in the end, and the highest form of life must conquer."—*See p.* 16.

THE BOOK OF NATURE

AND

THE BOOK OF MAN.

Wrynecks. Creeper. Nuthatches. Wrens and nest. Wryneck.

Illustrated with Photographs and numerous Woodcuts.

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THE BOOK OF NATURE

AND

THE BOOK OF MAN,

IN WHICH MAN IS ACCEPTED AS THE TYPE OF CREATION—THE MICROCOSM,—THE GREAT PIVOT ON WHICH ALL LOWER FORMS OF LIFE TURN.

BY

H.M.S.H.

THE PRINCE OF MANTUA AND MONTFERRAT,

AUTHOR OF "THE FOOD, USE AND BEAUTY OF BIRDS," ETC.

WITH A PREFACE BY THE LATE LORD BROUGHAM.

Illustrated with Photographs and numerous Woodcuts.

LONDON:

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PREFACE

BY THE LATE

HENRY LORD BROUGHAM AND VAUX.

IT has been my great pleasure to read this work, which I think will not want any commendation from me to render it a favourite.

I think the leading idea a very reasonable one. Man is undoubtedly the "MICROCOSM." The immense mass of facts collected in this book will I think render this plain to most persons. I have read the chapters on Botany, Zoology, Geography and Geology with great interest. Those who are not prepared to go with the author in all things, cannot fail to be impressed with his eloquent treatment of the subject. I am at a loss to remember at present, any book on Natural history more powerfully and graphically written than "The Book of Nature and the Book of Man."

He is entitled to the credit of great originality, as the systematizer and reducer to a science, of an idea, old as that of the Greek sages; but which has hitherto been treated only in a desultory manner by poets and metaphysicians of the German school. I see he makes some remarks (page 206) on the Lord Chancellors: I hope he does not intend to be personal.

The book unfolds a course of thought which if I were a younger man, I should like to pursue carefully. Alexander von Humboldt would have been much interested in this work, as the style of argument reminds me of that which occupied his attention* in the early dawn of the science of this century.

The Author has strode the gulf between physics and meta-

* "While the difference of sexes in all living beings beneficently binds them together in prolific union, the crude matters of inorganic nature are impelled by like instincts. Even in the darkness of chaos, matter was accumulated or separated according as affinity or antagonism, attracted or repelled its various parts. The celestial fire follows the metals, the magnet, the iron; amber when rubbed attaches light bodies; earth blends with earth, salt separates from the waters of the sea and joins its like, while the acid moisture of the *stypteria* (στυπτηρία ὑγρά) and the fleecy salt Trichitis, love the clay of Melos. Everything in inanimate nature, hastens to associate itself with its like. No earthly element (and who

physics, mind and matter, instinct and reason, God and Man; for his scheme of reconciling the Mosaic narrative with modern Geology, possesses advantages over those of his predecessors. He justly asks, presuming the Mosaic account of Noah's flood to be true, what the animals preserved by him in the Ark fed on when they came out of it. For it is idle to suppose that Noah himself fed these animals, during the many generations required for them to be mutually supporting.* His theory of the relation of Man to lower forms of life I like better than Lamarck's, and his theory of the Compound Unity of Man's mind I think will be of great use to the metaphysician. It is wholly new to me, as is his classification of the three kingdoms of Nature as "Moral, Organic and Inorganic."

Notwithstanding the intricate nature of the subject the style is simple and readily intelligible.—It ought to be highly popular. It is not unscientific because it is eloquent, or foolish because it moves our feelings. But in the words of my old friend Lord Jeffrey, "Though the sails are all purple and the prow of beaten gold, yet they waft on the voyage none the less, and more surely than if made of baser materials."

There is but one question I would ask the author, is the spiritualism of this work foreign to our materialistic, manufacturing age?—No; for amidst the varieties of mind which divers circumstances produce, are found those who cultivate man's highest faculties;—to these the author addresses himself. But even in the most cloudless skies of scepticism I see a rain-cloud,—if it be "no bigger than a man's hand;" it is "Modern Spiritualism."

will dare to class light as such?) can therefore be found in a pure and virgin state. Everything as soon as formed hastens to enter into new combinations, and nought save the disjoining art of man, can present in a separate state ingredients which ye would vainly seek in the interior of the earth, or in the moving oceans of air and water. In dead inorganic matter absolute repose prevails, as long as the bonds of affinity remain unsevered, and as long as no third substance intrudes to blend itself with the others; but even after this disturbance, unfruitful repose soon again succeeds."—"Vital Force," in Humboldt's *Views of Nature*, p. 383.

* See p. 423.

AUTHOR'S PREFACE.

"*MAN was made in the image of God,*" of an omnipresent omnipotent Being, and as such the type, the embryo of what is universal, at least as regards this world. This proves our proposition Man—the Microcosm. The impersonation—the representative man Christ, alone fulfils all the requisites of the Microcosm. But the most insignificant man indelibly stamped with his Creator's image, lives throughout all time, the epitome of the world he inhabits. What are the ties, the links that bind man to earth, that shadow forth his characteristics? In the Inorganic world we see his qualities portrayed with a precision and a simplicity, suitable in elements; in the various classes of organisms we see the leading characteristics of man, shadowed forth; and in the representative species representative men. One fact must be borne in mind, analogy often ends where resemblance begins: and where an actual resemblance is found between men and the higher animals we are forced in many cases to admit that the influence of man is here more directly seen: they reflect his image and refract it back to him.

Some writers have thought of Man as "the Microcosm," either by a direct attempt to view him in this light, or through incidental allusions. The subjects presented in the following pages, are with reference to Man and Nature, rather than with regard to Man and Books.

An attempt has been made to show how the Geographical features of a country and its Vegetables and Animals, harmonize with its human inhabitants; after which the Analogy between the great classes of organisms and the structure and habits of Man will be drawn. In the latter part of the work the analogy will be shown between the Chemical composition of substances and man's Constitution, and the analogy with the Chemical elements and those in human society, and between Geologic and human history.

Professor Huxley, in his Presidential address before the Geological Society for 1869, says, "I conceive Geology to be the history of the earth in precisely the same sense as biology is the history of living beings ; and I trust you will not think I am overpowered by the influence of a dominant pursuit, if I say that I trace a close analogy between these two histories."

Mr. Luke Pike, in his paper "On the claims of woman to political power" (Jour. Anthro. Soc., Ap. 1869), acknowledges the truth of the analogy between Chemistry and mind. "Chemistry"—says he—"illustrates the subject (of mind) better than any other science. Not only may the same elements mingled in different quantities, produce substances of different properties; but the same elements, even in the same proportions, may, under different circumstances, yield dissimilar products."

But the views of both these writers were expressed by me before the Anthropological Society on April 16, 1867. And before the Bristol Natural History Society, October 11, 1866. And very fully in a lecture before the Philosophical Institution of Bristol, January 14, 1867.*

In many cases in this work analogies are drawn; in many types; and in some few instances, actual resemblances are pointed out; which diverse character of illustration may be described as cords of greater or less rigidity which form the tie between Man and his *Earth*.

A chapter will be given on the analogy between Moral and physical Optics.

This work was written many years since, and the author acknowledges his obligation to the late Right Honourable Lord Brougham for the highly flattering prefatory critique on the manuscript of the work.

It was the intention of the author to have given a large number of extracts and references in illustration of the various subjects in this work, but they have been withheld (only for the present) for want of space. The following authors have written in a most interesting manner on the resemblance between man and animals: Aristotle, Camper, Vesalius, Porta, Haller, Buffon, Spurzheim, Da Vinci, Aldrovandi, Lavater, Redfield, and Fowler.

* Reported fully in the *Daily Post* (Bristol) for Jan. 15, 1867.

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NATURE AND MAN.

INTRODUCTION.

MAN THE TYPE OF CREATION—PROGRESSIVE CREATION—CLASSES AND AGES COMPARED—THE PHYSIOGNOMICAL METHOD OF STUDYING THE SCIENCES—THE PHILOSOPHY OF HEAD-FORMS—CREATION OF INDIVIDUALS AS OF TYPES—THE BATTLE OF LIFE—THE TRIUMPH OF TRUTH.

TWO great methods of scientific analysis have been propounded by two great men—Aristotle and Bacon—whose names are to science what those of Giotto and his predecessors are to art. Aristotle's method was argumentative; Bacon's, experimental. Aristotle's mode of reasoning, although often logically perfect from premises, was not based of necessity on actual fact; but Bacon stands forth, throughout all time, the grand exponent of experimental and inductive science, strongly urging the necessity of forming conclusions on this basis only. And he has succeeded in convincing the scientific world of the justness of this in theory, however strong the tendency of mankind may be to forget the lessons of experience, and to return to the philosophy of assumption.

It is but little that one man can do: representative facts and principles are therefore all that one mind can grasp in nature. Hence, as man surveys the different departments of nature, he inquires for types of them. These types are representative, and afford illustration for every other department of knowledge, whether usually supposed to be connected therewith or not. Still, all are mentally investigated by the same faculties, which give them a common stand-point. We hope to show, in the course of this work, the truth of this great principle, that the philosophy of mind is the centre or key of the philosophy of matter.

The portion of natural phenomena the mind of man can grasp is but small. "'Tis but a part we see, and not a whole;" and as it is only a grasp of a whole that can enable us fully to enter into and apply the Baconian system of philosophy, we are

thrown upon what we see, or upon the angle of vision at an ever-increasing radius. We judge by what we see, by the outside of things only, therefore our method of investigation is physiognomical, and not always, strictly speaking, "Baconian." Use experiment wherever possible, but man must still judge, as he has continued to judge in past times, by the outside of things, which, rightly considered, affords an index to what is unseen.

Man has always been a "physiognomist"—that is to say, an interpreter of signs. Some branches of knowledge are studied almost entirely physiognomically—as geology, founded on the crust of the earth, and yet pointing down to the invisible interior. The classification of man on a philological basis is mainly physiognomical, as its elements are arranged in accordance with signs possessing a resemblance, themselves pointing to processes of mind of similar origin.

The character of man and animals, developed in their actions and habits, can be further read in the outline of their forms. This last process is what is commonly understood by "physiognomy." Man has always acknowledged indication of character by form, but, like every other feeling common to him, it requires reduction to order and rule. The first step necessary in the "physiognomical" study of a subject is a knowledge of the character and properties of the elements of the subject, or, if this is not possible, of subjects allied thereto. Personal physiognomical examinations are many times more valuable than those at second hand, answering to reflected light—for there is great difficulty in describing physiognomical signs in words. If forms are the index of so much beyond the mere superficies, we are led to consider what special signs stand for special things, to ascend from the sign to its signification, and again descend backwards to the sign.

In considering human physiognomy, our course of reasoning first leads us to the consideration of what is common to man, which is exemplified in his outline as a being. His proportion of qualities as an individual is to be traced in his varying outline. The outline of every part of his body is highly significant. Foot, hand, trunk, head, and every part of it; skin and hair,—all, by their variations, indicate the varied characters of men.

As we have said, form in nature is significant of much more than, at first sight, we are willing to admit. We shall instance, as an example of this, the principal head-forms which are associated with special types of character amongst mankind. The student may read at a glance the rough outlines of the characters of those he meets with by the form of their heads.

The writer has found it very convenient to call the principal varieties of head-forms the Round, Long, and Narrow Oval (shaped like a flattened egg), Wedge-shaped, Square, Wide, Long and Short Prognathous, and Pyramidal. Some of these forms are characteristic of races, others of individuals ; they all accompany marked mental peculiarities, most of which have been verified by observations on the inhabitants of England and France.

The present population of the British Isles thus displays a great variety of head-forms, which accounts for their wide diversity in character. Our remarks on the varieties of character which accompany head-forms are more general than special, for the survey is too short and inclusive to admit of much detail or nice accuracy, and the extreme types cannot be always found at a moment's notice.

The Mongolic devastators of India and Persia had round heads, somewhat modified by the pyramidal. We proved this by measurement of skulls from the tombs of the Indian kings of the Mogul dynasty, and the comparison of them with coins and drawings of sculptured heads ; the Mongols of the present day have this type of head. The Moguls conquered, but they did not impart their language ; they crushed rather than developed the resources of nations.

The Round head is accompanied by a tendency to extend and migrate, and with less attachment to home and offspring than either the oval or narrow types. Men with round heads accomplish much to a certain extent, and easily organize, but show far less capacity for individual improvement than those with oval heads : they cannot settle, they must roll. "A rolling stone never gathers any moss," or leaves a permanent impression on the ground it traverses. In like manner, men or races with this configuration may be great as conquerors, but do not influence society, like those with sharper and more angular heads. Nations with round heads are driven before those with hammer- or wedge-shaped heads, who find, however, difficulty in dividing or detaining them ; for rotundity here, as well as in physics, is accompanied by a strong principle of cohesion. The hammer strikes the ball, which flies, but may rebound and strike its assailant. The old conflicts between Europeans and Mongols, and the modern between Russians and Turks, have often been of this character. The Russian and Teutonic heads are much longer than the Turkish. Round-headed people are difficult to manage, for they are not influenced by those economic instincts which induce the semi-savage to become a useful servant to civilization.

A few Englishmen and Scotchmen have this round type of head ; they have much energy of character, great obstinacy and

bigotry, and are deficient in practical wisdom. This form of head is common in Spain, and perhaps points to a Mongolic affinity in the aboriginal population of that country; but it must be allowed that this also approaches the Moorish head-form.

The Greek form, or Oblong skull (a subdivision of the square), does not rise on the crown like the round head. Greeks are deficient in that stability and consistency which characterize the round-headed nations; but the superior length of the Greek head, especially between the ear and the frontal sinus, gives it vastly greater intellectual power. The Square is the commercial, manufacturing, and contracting head. The Greeks show many of these characteristics.

The Round oval is the highest type of head, being distinguished for beauty and accompanied by great moral, intellectual, and physical powers. It is well shown in the portraits and busts of Shakspeare, Melancthon, Milton, Oberlin, and of many a sage, both in ancient and modern times. In this type the intellectual and moral faculties preponderate, but the selfish and domestic propensities are not relatively deficient. It is the Celtic-Scandinavian type, but it is found amongst the truly great of all nations.

There are two important modifications of the oval. The first has been termed the Long Flat Oval, and the second the Short Flat Oval head-forms. Men with oval heads which are flat at the sides, either long or short, are commonly more fond of literature and science than of the mechanical arts; they are not generally fit to be at the head of a commercial business, although their intellectuality and relatively weak selfish propensities render them little liable to be overcome by temptation to fraud in places of trust. They may, notwithstanding, from the tenacity of their memories and their orderly habits, make excellent clerks, and are willing, in many cases, to work for much lower salaries than those far inferior to themselves in intellectual power, but who possess broad, that is, selfish, heads.

The portraits of the late Sir Walter Scott and Mr. Craik, the eminent scholar of Bristol, well illustrate this form of head, as do their characters the psychology that accompanies it. This form of head is associated with strong domestic affections and great stability of character, unlike the short-flat oval, which indicates considerable intellectuality of a superficial kind, but little depth of feeling or concentration of power.

The Wedge-shaped head is divisible into the Long-wedge-shaped and the Short-wedge-shaped.

The Long-wedge is very common amongst persons of Gaelic descent. Its greatest width is about an inch before and an

inch above the mastoid process. It has great length between the frontal sinus and the ear, sometimes as much as five and a half inches axis. It has a general flatness on the temples and above the cheek-bones, which are often high. The qualities which accompany it are perseverance, singleness of mind, and acuteness; but with little moderation, sagacity, commercial wisdom, or mechanical ingenuity. Such persons, like the wedge in mechanics, may be ready agents for demolishing what has been united for ages; but they have little power of re-uniting what they have divided. The wedge in mechanics can do nothing unless it receives an external impetus, and the wedge-headed peoples are more powerful and prominent when they are inspired by a mallet-headed nation. The Celts of Ireland, generally wedge-headed, received increased activity in contact with the mallet-headed Normans.

Individuals with the Short-wedge-shaped head resemble the long-wedged in their deficiency in practical wisdom and commercial acumen, and are equally active as opponents; but, being liable to alter their course, they cannot be relied on as partisans. The better specimens of individuals with the Long-wedge-shaped head have often great capacity for analysis, but are relatively deficient in the power of logical demonstration. Persons with the Short-wedge-shaped head have not the same ability for becoming historically acquainted with a subject as their longer-headed brethren, who are often highly gifted in this respect.

The Square head common in Great Britain is often of a large size; it is nearly of the same width all along the sides, and is the accompaniment of great prudence, enterprise, and working power. Individuals possessing this form of head, which is at the same time depressed on the crown, are apt to have a low moral standard, and are not so likely as those with high heads to attain an elevated position. Wealth may be obtained by a man with a broad but low head; but selfishness and a tendency to fraud are often seen in such an one. Most persons who make money fast, who are successful contractors, or who originate profitable manufacturing businesses, have square heads.

A head wide over the ears, low on the top, narrow and low on each side of the forehead and in the sinciputal region, is most commonly found in depraved characters, criminals, and malefactors. Individuals having it, often possess great muscular strength, but require the government of others or they soon wear out; force is the only logic they understand or practise.

The Pyramidal head described by Dr. Prichard, rises in the form of a cone or pyramid from the ears to the crown: it may

be said to be most characteristic of the Mongolic races. In the Laps and Esquimaux it is found in its purest forms. The pyramidal type is accompanied by a narrow bigoted mind, having little capacity for science, but possesses great aptitude for handicrafts. In the Chinese it is modified by the square, and in that nation we see bigotry, obstinacy, industry, and commercial acumen combined.

The Long and Short Prognathous forms, characteristic of the heads of the Negroes of Africa and the Oriental isles, are mainly confined to them; but individuals of European descent, having long or short heads, occasionally show some approximation to this type. This is partly occasioned by the small size of the chin, which does not give room for the teeth; they thus project in an unsightly manner. This was most probably in the first instance produced by ill-assorted marriages, which resulted in the teeth characteristic of one parent being communicated to offspring, but without sufficient space for their location. Of this we could name several cases which have fallen under our observation during our researches in family history. Prognathism appears to be usually the accompaniment of but a small power of self-government. Amongst the Blacks, it is characteristic of a race (Negroes) who have little self-control, and amongst Whites of a small share of that resolute reticence which accomplishes great things. The length of head from the ear to the occiput indicates the strength of the domestic propensities. The Negroes of the Congo River, and other tribes, have this region largely developed. Their domestic affections are strong, unlike those of the Oriental Negroes or Negrittos: they possess the short form of the prognathous skull. A habit of showing teeth, in the animal kingdom, is a very general accompaniment of ferocity, as exemplified by crickets, the Felinidæ, bull-dogs, gorillas, and Negroes.

Slight variations in the head-forms described are accompanied by slightly different qualities, but still the deductions, though somewhat wide, are true on broad grounds.

If man is a type of the universe, and if the science of his mind is a type of all the other sciences, the physiognomical principle must be applicable to the study of science in general; for science does not consist of divisions entirely distinct, but of many branches proceeding out of one tree—man's mind. Chemistry hangs on zoology, botany, mineralogy, and optics as much as they do on chemistry; and even mathematics, which it has been the fashion to isolate from other sciences, contains the principles of many. Isolation, impossible in fact, is injurious if attempted in theory; hence the disadvan-

tages of a mainly mathematical education, which is not a soundly scientific one, as the principles of mathematics are dependent in their application on facts scattered throughout a great many branches of science. Music is dependent on number, time, and mechanics, as well as on sound, itself a mechanical process. Geometrical measurement is equally dependent on variations of temperature. As the science of mind is the centre of sciences, its study becomes the most important of studies, but its position as such is little acknowledged. The principles that regulate every branch of study are taught diligently as necessary to that study. It should be the same with the study of mind.

It is still further sought by some not usually superficial, to isolate general science from theology, as if one class of facts could contradict another, and the revelations of the Deity oppose the discoveries He permits man to make. A slight colouring for this erroneous course of argument, is afforded by the use made by the Deity of national minds or modes of thought, prevalent in given ages. It is surely somewhat difficult to translate ideas prevalent at the earliest stages of society into modern language, so as to correspond with all modern trains of thought: but these difficulties do not detract from the value of a truth of a religious or scientific character, but merely call for our careful and conscientious consideration, which, when given, "a flood of light" is thrown on the past and present, although viewed as it were through different lenses or combinations, the ancient and the modern.

The tendency of individual minds is to give undue importance to their special aptitudes—that is to say, the sort of argument which they individually most appreciate—so that distortion or exaggeration of favourite processes, and consequent depreciation of others, is the result. Few individuals possess evenly-balanced minds, capable of giving their due weight to all different classes of argument. Some are mainly led by the intellectual faculties, others by the moral; others, again, by the domestic, and some by the selfish propensities. All these diverse qualities assist and are equally necessary to the investigation of truth, but the too greatly predominating influence of the intellectual, or even of the moral or other classes of faculties, leads us away from truth. The most perfect man is he in whom all the faculties are nearly balanced, and of sufficiently great power and inclination in a particular direction to incline others as he is drawn himself. Such minds should be accepted as leaders, if any are.

"Oppositions of science, falsely so called," are generally experienced by minds either ill-balanced or of an inferior

order. Balance and harmony, more excite our admiration and command our respect, than the highest qualities which form part of an incongruity. This is as true in human character as in works of art. But great proportions must be displayed to command much influence.

In a work which accepts man as the type of creation, and points out many illustrations of the doctrine that he is its great centre, it is certain that many different classes, species, and divisions of the great kingdoms of nature may be found to illustrate the same part of man's nature, or the same division of man's race, or the same class, out of the many classes, into which each race or nation is divided. And so it must be, if every class in nature is to find its centre in man.

Minute shades of difference in typical illustration could doubtless be found, but in a subject so wide as this, merely an attempt can be made to gather together some of the bricks, mortar, and scaffolding necessary to begin the foundation; a complete edifice fills the universe, and is the dwelling of the universal man.

> "Mark his majestic fabric: he is a temple
> Sacred by birth, and built by hands Divine;
> His soul's the deity that lodges there;
> Nor is the pile unworthy of the god."—DRYDEN.

And surely he is a type of the God of the universe.

Some persons may, perhaps, suppose that, in works which endeavour to unfold new or little-known methods in philosophy, the resources of rhetoric are not required, and would advocate a bare statement of facts. But what do we see in nature? All is living here: the trees and animals flourish and pass away, but their elements are immortal; the candle of life may be smothered, but its extinguisher cannot cover nature. Why, then, such an attempt? Why such an inversion of God's order? He did not leave the skeletons bare or the leaves faded, but gave to all a natural garment, glowing or dusky with the daylight or the twilight. Some men (of science?) are satisfied if they can but draw the outlines of the skeletons; but this aspect of nature, repulsive to the common man, is not the less so to the "true naturalist," who, while he expects to see the skeleton as a foundation, shrinks from a parade of baldness and bare bones; and thus many a student of nature avoids the naturalist's library as he would a charnel-house. Then let us hoard the glittering dust which the naturalist has discarded—the spoils of the sunbeams. His prodigality but enables us the more easily to make our fortunes. Yes, "hold up the mirror to nature," and see her reflected there in all the linea-

ments of life. No cold gray outline is there; the frame of a living being, but wanting all the glowing tints that seem to breathe.

Nature is the herald of man's actions, the Earl-marshal of his dignities and his deeds. From very early stages in society animals, plants, and minerals, symbolizing his qualities, have been adopted as his arms. This work is but an heraldic dictionary, not of a class, an age, a nation, but of man.

Two systems of classification have prevailed: the artificial and the natural. The first may be called the *inorganic* classification of organisms, which are thus degraded from their lawful position. Next followed the NATURAL SYSTEMS, which admitted their habits and instincts as one element of their classification. But even these last-mentioned systems mainly adhered to dead anatomy as the basis of arrangement. Is there not room for a classification which principally considers mind in man, and instinct, habits, and properties amongst the lower forms in nature?—for a moral system rather than an anatomical system?—for one that regards anatomy chiefly as a tabernacle of flesh and bones? We are told in the Scripture that "the sabbath was made for man, and not man for the sabbath," which is in accordance with the principle that instinct, mind, and morals should have the first consideration in the formation of systems.

The typical significance of the three kingdoms in nature is great. If we see in the mineral kingdom man's bodily constitution, and in the vegetable his animal life, so in the animal do we see the life of his spirit typified. And as we advance and examine every step made in the animal kingdom towards a higher life, we see an illustration of man's progress. His physical progress is powerfully and strongly shadowed forth, but his moral progress is so still more.

Plants, we have said, are a type of the animal life of man: their growth is similar; they derive their subsistence from earth, air, fire, and water. Fire is represented by the temperature required for growth: the air supplies a portion of the nitrogen and oxygen so essential; while the carbon and salts are derived from the earth, and the hydrogen from the water. Similar laws govern the sustenance of living animals; and, to extend the analogy further, they sustain the mental life of man. Corporeally he requires the aid of all these four agencies, anciently called elements. The sustenance of his mind may be contrasted with that of his body. Thus man is equally dependent on the moral, as on the aerial or gaseous; on what is intellectual, as on the fluid; on the emotional, as on what is glowing, ardent, or fiery (caloric); and on what is domestic, as on the earthy.

This is but another view of the four temperaments as analyzed by ancient writers.

When we compare the ages of man's history with the different classes of animals, we see that the same analogy in great detail pervades them both. Thus in the lowest Infusoria we see a type of the world in the days of Adam after his fall; while the Polyp class is an illustration of the generation from Adam to Noah, gradually progressing. A great step was made by the builders of Babel, who, like the Echinodermata, first began to be covered with a shell or house. The period of the Entozoa was a progressive stage, but smaller and insignificant, and well illustrates the divided minute nationalities into which men were separated; while the Rotatoria, a connecting link with far higher classes, typify the approach to civilized life on which nations entered as they commenced a period of profitable activity. Nations had now begun to whirl on the wheels of separate existence towards that great goal, the development of man. The Ringed-worms are typical of the degraded life of these early nations; but some rose high in their class, so as to become representatives of the more elevated of mankind in a dark age. The insect order, in which most of the creatures are very small, yet very ingenious, reminds us of the age of small tribes but great inventions; while the Crustacea, inhabiting the water, suggest the life of the earliest mariners. The Mollusca are comparatively helpless, and have few influential members capable of accomplishing great deeds. They typify weak, flabby nations.

The first establishment of great monarchies, like those of Egypt, Assyria, and Chedorlaomer king of Elam, are typified by the commencement of Vertebrata, or a class having a backbone. The government of the Israelites in Canaan, and of the early monarchies of Greece and Rome, may be illustrated by the birds; while the reptiles are in all these ages of vertebrata the type of what is degraded and corrupted. Lastly, come the quadruped Mammals, which, in the four symbols of Daniel, are made to exemplify the four monarchies; while the reign of man is illustrated by the commencement of the kingdom of Christ —the only period of the true rule of man: for, when under the influence of his passions, he is not his own master. We shall enter more fully into this illustrative detail in the body of the work.

It is a much higher attainment in a naturalist to discover the balance and mutual dependence of the various divisions in nature than to catalogue or even to describe new species, perhaps on grounds mainly arbitrary, as time and place—to

raise a monument of artificial ear-splitting nomenclature—a house of card-labels, to crumble in the next age. But he who discovers the vital compass, gains a knowledge of those poles round which orbs of life revolve. Man himself is a sun; the vegetable cell but his remotest satellite.

In systems of classification, the true system of nature is sometimes but little considered; although they are called "natural," they are almost purely *artificial* systems, written and contrived by ingenious men, who saw the necessity of some sort of arrangement, in accordance with the principle, that, in order to learn things distinctly, we must carefully individualize, or take up one by one. We follow out this principle, and find that we accumulate a mass of facts which obviously differ, and resolve themselves into different classes. This is the natural effort at classification, and more or less presents itself to every human mind which uses its faculties in arranging the materials of thought it has acquired, in observing the phenomena of the world. The Moral system of classification proceeds on the same principles as our Physiological systems, that is to say, to classify by resemblances and differences.

We accept as sound the principle of physiological classification, as a method of discovering the affinities of genera and species. On account of our deficient knowledge, such a method of division is at present very imperfectly carried out. An effort will be made to show that many links which are missing in our physiological systems can be filled up by typical illustrations derived from the moral world, intended to prove the connexion between the earthly and the spiritual, the material and the mental. The chain of analogy that surrounds nature we believe to be unbroken, but the short-sightedness of man, the dust that has accumulated for ages, the vapours arising in ill-conditioned minds, and the fogs which long hang over "the unexplored," have hidden this immortal fact. The links which to our sight appear broken, as we survey the chain, are surely many. But we must not look for the whole chain of nature to be within our grasp at present. Many links, now hidden, are discovered as having existed in past ages, and many may be developed in ages yet to come. This chain extends from the beginning to the end of Creation; it is sometimes drawn loosely, and at other times it forms a rigid line.

The Spirit of the Creator presides at the communication of life to every individual of a species, and over every combination of elements, or over the very forces produced or producing every cognizant or incognizant event: this is the Doctrine of Peculiar Providence.

Begin with the simplest combinations of elements, and the lowest forms of vegetable and animal life, and rise to man ; the same Creator of the elements presides at their combinations, and the same Creator of specific organisms adds to their number as individuals. Species are but the agents through which life is communicated ; the presiding cause and the source of life is near, but distant. The same is true with regard to chemical combinations, which derive their affinities from the same source. This great fact of the perpetual creation of life and combinations, explains the incomprehensibility by man of the essence of life—which is God.

There is a great focus of creation, as well as a great focus in creation ; the central habitation of the GREAT PRESIDING SPIRIT, round which stars revolve, and worlds as numerous and comparatively insignificant as motes in the sunbeams, which also owe their visibility to a great focus of light.

Types of man's character are illustrated in all departments of nature, from the geometric cell-like plants, which float in fluids, all angles and corners, requiring a microscope to bring out their traits of character, to the apes which most resemble man in form. These last imitate his gestures and habits, but, like many persons who "ape" those above them, never attain to their perfect performance. The accompaniments of decomposition in animal and vegetable infusions, INFUSORIA, though necessary and useful in a *low* position, are quite unfit for a *high*. They often require to be removed, and should not be stirred again with "the mother-liquor" from which they sprung, on which they would act injuriously. They typify "the scum" of the population, that rise to the surface in countries "ventilated" by the press, which, if removed for the use of other lands, may effect great good, but, if allowed to remain where they are, tend to the disintegration of the parent state. The Hydra, all-devouring, bearing a star, is placed next to the Infusoria in some systems of classification ; they have little solidity but enormous grasping power. They appear to point to a new rule of arithmetic, for they are multiplied as they are divided.

The Coral Polyps accomplish much, and show what great works the smallest creatures can produce when they co-operate in vast numbers. Is little man to sink his individuality to execute what is great as a community? The Pyramids of Egypt ask us this question. The leech was formerly acknowledged to have its counterpart in one of the learned professions. What Elizabethan writer does not mention "*a leech*"? It was thought to be a most miserable end for Herod to be eaten of worms. Are not leeches worms (annulose animals),

which are never satisfied till they can hold no more? Their application to the living recalls the lines of Byron:—

"It is as if the dead should feel
The icy worm around them steal,
And shudder as the insects creep,
To revel o'er their rotting sleep,
Without the power to scare away
The cold consumers of their clay."

It is absolutely certain that the soon ripe in nature soon decay, and that those late in bearing fruit last the longest. This analogy pervades the moral world as well as the organic, and still lower down the inorganic. Crystals slow in formation retain their form longer than rapid crystallizations. Infusoria, slowest in development, build up our mountains, their skeletons forming the grandest monuments of extinct organisms. Insects, the most powerful as individuals, like the Mantis and the larger Coleoptera, often require years to attain their full development.

The bees, the ants, the wasps, the most intelligent of insects, require much tending in their infant days, but yet their works prove what they can do in their maturity. The reprobate aphides, the lice of plants, live but a day, and multiply as soon as born—the type of those whose youth is stained by violations of natural laws. And mollusca, long in attaining even moderate size, longer in breeding, live many years. Every plant that survives centuries blooms but seldom; its flowers and seeds are small, and modest shields protect the fructifying germ.

The highest members of the various classes of organisms, like the most elevated among ourselves, show the greatest regard for offspring. The seeds of the highest plants have much protecting covering. Among the reptiles, the python, grandest of its order, hatches its eggs; and the crocodile, the largest recent lizard, is said, unlike the lizard tribe in general, to break the shell covering its young.

The sharks, the grandest of the fishes, protect their eggs in cases, and twine them among the seaweed, to which they cling as to a foster-mother's skirts. The whales, the great mammals of the deep, the giants of life, long protect their young, unlike the vast number of the fishes, who never approach them in intelligence. These mostly cast their spawn, the seed of their young, in the waters, and leave them to work out their own destiny, or watch to devour them.

And so the birds, who love their young most, like the condors, tend them with untiring care; see them soar up to pierce the "vaulted sky" that snow-peaked Chimborazo pillars. Thus the young warblers of the grove unite their voices with their

parents; their simple offerings to heaven, rising on morning mists, repaid by evening dews, from that portal, as it welcomes in their vesper sacrifice. Such are the birds whose young must live in nests formed by the industry of their parents. They are mostly naked when hatched, for the beautiful feathers of the parent-birds are not even represented by much down, such as covers at birth the running and the swimming birds, whose habits are more earthly.

Then come the quadrupeds in whom prevails the same analogy to man. The guinea pigs, and others still lower in

A GUINEA PIG AND FAMILY.

the scale, do not tend their young with the same care as the elephants and monkeys, which long cherish their offspring with more care than some human beings. Years elapse before they separate from the family haunt, and perhaps before they leave they see a troop of younger offspring of the same parents. All this teaches us that the highest members of every class in nature display the strongest clinging affinities. The noblest trees are the most deeply rooted in the parent soil. The precious stones and the bright metals cling to their matrix with tenacious grasp. Forces must "rend the bowels of the earth" to tear them from that mother's side that gave them

birth. And as we rise to man, through all the devious links, from class to class, and choose the noblest, each shows the strongest family instincts, binding young to old and old to young. And so all nature shows without reserve that the crown of every class is given to those who protect their offspring most.

He who acquires knowledge of the different kingdoms of science gains bloodless victories over them. He is a conqueror, as great in his way as Cæsar or Alexander, and may possess an empire as vast as that of William III., and by right as stringent as that of conquest. The United Kingdom is a type of man's constitution. The main body is Saxon, the soul is Celtic, while much of the spirit is Irish.

We divide Nature into Three Empires—the Inorganic, the Organic, and the Moral. He who first breached the artificial walls which encompassed these three great domains did much if at the end of his life he put his foot on the threshold of each. But the young man may now do this in the days of his youth. He may indeed breach the walls of these great fortresses, and apply the scaling ladders on which others have climbed before, every step having been perhaps the work of a long life now passed away. He ascends and takes possession of vast treasures, and finds how to his mind the artificial walls have crumbled; and as long as he lives he sees them crumbling around him, and assists in the work of demolition. In proportion as he does this is his power consolidated, and his true domain extended. He attends to the "order of nature," and sees how this Vast "*inseparable Unity*" has been *wisely divided*, that its parts may be within the grasp of the smallest and most insignificant artificers, who fly in at the breaches made by those typified by the first who scaled Badajos.

The original mind frequently rejects the beaten tracks of science. It sees before it the summit of knowledge and of fame, which the common mind, viewing the rocky crags that guard its approach, pronounces "inaccessible." The peak of the Matterhorn was long regarded in this light, but six adventurers, scorning "impossibilities," attained the top. A hero's course is run when he has won the battle. Four fell, and two were crowned victors. An early grave thus often awaits the gallant and the enterprising; yet in our climate let us hope the sod will be always green over their ashes, until the Inorganic, the Organic, and the Moral kingdoms rise in resurrection. Then will the fruits of all these conquests be realized, and then will the triple crown of the three kingdoms be bestowed: that of the glorious flame of life, the type of the spirit; of the "bay

ever-green," of the "olive ever fresh;" types of organic life, ever living, and these united by a diadem of everlasting gold, the Inorganic Crown.

But the conqueror may return in triumph from the war, and receive from a grateful country the reward of his labours. Napier the Fifth, burning to deliver Britannia's children from the nest of the Abyssinian vulture, climbed to the heights of Magdala. "He read their history in a nation's eyes," and, among the many wreaths showered upon the hero, a simple-mottoed laurel outlasts them all:

TRUE TO HIS NAME, HIS COUNTRY, AND HIS FAME.

The struggle for a virtuous existence, the triumph of higher over lower forms of life, the triumph of truth over error, of honour over craft, is well illustrated in the story of St. Michael and the Dragon, so often represented by painters of the Italian schools. We have chosen the world-renowned rendering of Raphael as our frontispiece, as giving better perhaps than a modern conception this typical contest; for we see typified in the beautiful and majestic figure of St. Michael the noblest, the divinest aspirations of man in the ascendant, and in the brutalized figure at his feet the impersonation of human villany; although once clothed in the majesty of a transcendant demon, and characterized by an everlasting opposition to the laws of God and of nature, yet now incapable of injuring any but the base!

Truth must triumph in the end, and the highest form of life must conquer.

THE BEELZEBUB MONKEY.

CHAPTER I.

HARMONY OF GEOGRAPHY AND ETHNOLOGY.

CENTRES OF CREATION—HARMONY BETWEEN THE QUALITIES OF MEN AND THE COUNTRIES THEY INHABIT: AS IN STEPPES, MOUNTAINS, FLOW OF RIVERS, DESERTS, TEMPERATURE—THREE GREAT RACES: MONGOLIANS, POLYNESIANS, AUSTRALIANS.

GEOGRAPHY and Ethnology harmonize; that is to say, the races chosen to inhabit particular regions of the earth, or who have been induced to settle there, and find a *true home*, possess not only qualities adapted to their climatic, zoological, and botanical surroundings, but are constituted in harmony therewith, so that the race is more or less the key to the locality. This appears most strongly marked in our consideration of the lower divisions of the human family, but more or less pervades all. Those races that are more cosmopolitan, in proportion as they are so, represent the world, or a narrow confined section of it when their qualities are of less universal application.

We do not mean to say that we can at every period of their history, and in every small nation, trace what is in harmony with the land they have occupied, or do occupy, but we think that the specialities of great races are in harmony with their true "Centres," by which we understand the countries especially allotted to different stems from the same root in the genealogical tree of man. The difficulties attending the complete course of our analogy between race and country are past, present, and future, by considering which we can alone discover the true "ethnic centres." Were the different regions of the earth apportioned to the different varieties of the human species? Were the various countries prepared for each previously to the settlement of the particular race there? Was the land at first prepared for man, and then man for the land? Had adaptability the second place to proclivity amongst ethnic forces? In a subject like this, general correspondence and harmony must more be looked for than those of minute details.

The Mountains, the Rivers, by their elevation, course, and direction, illustrate the character, history and migration of

races; as do Deserts, Steppes, Llanos, and other physical features, national or racial character and habits.

The inhabitants of mountainous regions are usually considered to be distinguished by loftiness of spirit and love of freedom. Pure mountain air may have somewhat to do with cherishing this feeling, and scenery of a grand character, abounding in rugged precipices and deep defiles, may have somewhat to do with kindling into flame an enthusiasm which already exists. But it is an independent spirit which prompts a nation; it is a self-reliant spirit which leads it to these lofty regions, where loftiness may commune with "loftiness," and a towering spirit with "a towering height." The inhabitants of mountains may sometimes envy those of the valleys, where the sun shines so long, and in the days of prosperity descend to eat the fruit of the citron, the olive, or the vine; but adversity they feel to be more in harmony with the desolate crag.

> "Away, ye gay landscapes, ye gardens of roses,
> In you let the minions of luxury rove;
> Restore me the rock, where the snow-flake reposes,
> Though still they are sacred to freedom and love."

The inhabitants of Steppes are commonly wild, roving, and independent, and usually democratic rather than aristocratic, unlike mountaineers, whose tendency is to *look up to chiefs*, as to a mountain peak. The inhabitants of steppes acknowledge great chiefs, who are few in number compared with those whom mountaineers obey. This is the case with the inhabitants of the steppes of Asia, as with those of the pampas of South America, or the Llanos of Mexico and Peru; while low plains are generally inhabited by those who are more inclined to a democracy.

In flat countries lying at a low level, the inhabitants are mostly dull and heavy. They may be industrious, as in Holland, where the stimulus of the wants of an increasing population first led to the subjugation of the sea—a conflict which they have successfully maintained for centuries. They gaze on its "mountain billows," which are the only mountains they commonly behold, and which are ready, with an avalanche of foam, to take advantage of any defect in their "much-vaunted bulwarks," glory over any flaw in their outworks, and engulf in the seething German Ocean centuries of labour. Such conflict with the elements is a noble struggle for a nation, and the best antidote against "a dead level" in its society.

The Mountainous Systems of Europe are pregnant with interest, if we view them as illustrative, by their direction and elevation, of the course and power attained by nations. The most lofty and grand of the mountainous systems of Europe is the Alpine: it extends from Genoa to Vienna, from

the Pic des Ecrins to the Rhœtian Alps and the Tyrol. The Vorarlberg chain, extending through the Tyrol, Swabia, and Bavaria; the Carnac and Julian Alps; the Jura mountains, the Apennines, the Eastern Alps of Dalmatia and Croatia, and the Danubian principalities, Albania and Montenegro; the Alpine chain in Greece and the Morea; the Carpathian mountains of Hungary and North Germany,—all belong to "the Alpine system." This so-called "alpine system," or series of systems, which have been thus classified by Bruguière (see A. K. Johnston's Atlas, plate 3), we think represents great empires and rulers raised as much above small states, or the populace, as these high peaks are elevated above low hills.

The highest mountains are in Savoy, which formerly belonged to Italy, to the land of the Cæsars, but now to France. Napoleon, in crossing the Alps from France to Italy, did but approach Cæsar's throne. The Alps, by their height, represent Italian power. I shall endeavour to trace how far the mountainous chains in each country represent its dynasties and rulers.

The Gallo-Francian mountains, of which the highest is the Puy des Sancy, 6,220 feet high, is a truly French mountain, and illustrates by its altitude the power that monarchy attained in mediæval times. The various high peaks in Germany, the Tyrol, Hungary and Bohemia, as they tower among their fellows, typify "the mantle of Cæsar," which for a time fell upon some fortunate prince of central Europe.

The chain of the Apennines splits Italy into two unequal parts, and is one of the great hindrances to its unification. Monte Corno, the highest mountain within the late Papal States, typifies the Pope's position. He is the principal obstacle to progress in Italy. The Apennines have been called the "backbone of Italy;" and surely they have been "a bone of contention," or line of separation, between north and south Italy.

Etna is the highest peak in the late kingdom of the two Sicilies. As a great volcano in a volcanic island, it may represent a population inclined to eruption; as Vesuvius in the neighbourhood of Naples does the disposition of the *lazzaroni*. A very large portion of southern Italy, and the whole of Sicily, is volcanic. The volcanic nature of this soil typifies chronic discontent, as an active volcano does a revolutionary centre, and an *eruption* an insurrection. Insurrections sometimes occasion incendiarism, and generally a great deal of dust, mud, and dirt are cast out and scattered with but little regard to persons or property. Revolutions proceed *from beneath*, and so do volcanoes; while enlightenment and moral progress, that descend from above, are typified by the light given by the heavenly bodies.

The Hesperian System of mountains includes the Pyrenees

and the mountains of Spain and Portugal; it is a large system, the highest part of which is the Cerro de Mulahaçen, in the province of Granada, which towers to the height of 11,663 feet; a true representative of the Spanish monarchy, and of the lofty elevation it attained shortly after the conquest of Granada.

The mountains in Sardinia and Corsica have been formed into a distinct system. The population of these islands has much Punic blood; but the hero of Corsica—Napoleon—was Italian rather than Corsican, and his views towered higher than any mountain in the little island of Corsica.

The Sarmatian System, or that of the mountains of Poland, is not an elevated chain, not rising above 1,100 feet; a type of the kings of Poland, whose power never attained a height equal to that of the western kingdoms of Europe. These Polish mountains are low, compared with those of the Ural, which separate Asia from Europe; and, if they represent the Russian Czar, clearly approach what belongs to Asia—a semi-Asiatic government.

The mountains of Scandinavia have been considered to form, with Lapland, a system which is denominated the "Scandinavian," the highest point being 8,500 feet. This elevation perhaps typifies the great Scandinavian princes, Gustavus Adolphus and Charles XII. of Sweden.

The Rivers of Europe and Asia flow in different directions towards oceans and seas, which may be taken to signify to a great extent the direction followed by human emigrants from the different countries. The largest portion of the rivers in Great Britain, Germany, and France, flow towards the Atlantic or the German Ocean, connected therewith. In harmony with this, the flow of population from these countries is mostly across the Atlantic.

The Rivers of France and Spain partly pour into the Mediterranean and partly into the Atlantic, and the "flow of population" is partly east and south, and partly west. The rivers of Greece and Italy all flow into the Mediterranean, and the flux of population is not mainly transatlantic. Still less is it of those countries whose rivers enter into the Black Sea, whose population do not to any great extent voyage further than the Mediterranean; at least, not to settle.

The populations which live on the banks of those rivers which flow into the Caspian Sea, the Sea of Aral, and the Lake Baikal, which have no communication with the sea, are still more exclusive, reaching Europe on the ocean rarely, compared with the inhabitants of other continents. Vast rivers, such as the Lena, Yenesei, and Obi, pour into the Arctic Ocean, an ocean difficult of navigation. The population has little communication with

the sea, and does not much attempt navigation ; the inhabitants follow their rivers to the ocean, but do not go much farther.

Most of the rivers in Sweden flow into the Gulf of Bothnia, the Baltic, or the Atlantic Ocean, and very few into the Arctic Sea. The "flow of population" is towards Russia, Prussia, Germany, or Britain, rather than towards Spitzbergen, although a few rivers, running from Lapland towards that island, typify the summer visitors from Lapland or Archangel.

The rivers of India run in different directions—the Indus flows into the sea between India and Arabia, that portion of the Indian Ocean which receives the waters of the Persian Gulf. The population who follow the course of the Indus have more commerce with Persia and Arabia than the population who follow the Cauvery, the Godavery, and the Kisthna, into the Bay of Bengal. The mouths of these rivers are farther south, and the populations who follow their course settle in the Mauritius or other islands of the far south, or even in the Western hemisphere. The Ganges empties itself into the sea at the top of the Bay of Bengal, which situation points pretty nearly south, but its various mouths may take in many points of the compass, significant of the emigration of the Bengal coolies to so many lands. The truth of this remark is easily proved by taking a good map of Hindostan, and drawing straight lines on the sea in the direction of the different mouths ; this will be found to include many of the thirty-two points of the compass.

The rivers of China all point east, or south-east, or north-east. Chinese emigration follows in these directions—that is to say, to the islands of the China sea, of the Pacific, to Australia, and California and parts of South America, rather than towards the western portion of Asia, Africa, or Europe.

The commerce and trade of the Euphrates valley, except that overland, is with the eastern countries of Persia, India, and Oman principally, in accordance with the course of the river.

Nearly all the great rivers of America flow towards the east, which is significant of the direction their commerce takes, and which their population will take, should their land ever be saturated with that of the Old World ; or when Palestine becomes the political, as it already is the geographical, centre of the Old World. These great continents of America being fertile and peculiarly rich in vegetable life, and possessing few great deserts, like those of Africa or Asia, or the island of Australia, have large rivers, "vast bodies of water" which, flowing from the west, meet the waters which proceed from the east, from Africa and from Europe.

The sea is the medium of communication between the countries ; the productions of one flow down its rivers, and are

exchanged for those of the other. The larger size of American rivers points to active vegetation, and to the export on a large scale of the productions of the Vegetable Kingdom. The portions of America which yield the most valuable minerals are more deficient in inland navigation than those which yield timber and raw vegetable products. The abundance of water, although the one means of producing this fertility, yet has a further significance. THE METALS AND MINERALS ARE MEANT TO BE CONVEYED ON ROADS OF THEIR OWN MATERIAL.

From the rivers we turn to their source of supply, the rains. Rain is most unequally distributed over the earth's surface. In some parts no rain falls; in others an excess, to the casual observer. Rain may be taken as typical of all blessings descending from above, which are distributed in different measure. From the tropic of Cancer to the tropic of Capricorn, and somewhat beyond and below the first-named, in Asia and Africa, periodical rains fall, there being a rainy and a dry season somewhat distinctly marked. A tropical zone of "constant precipitation" extends from the 6th to the 9th degree of north latitude, which is, however, interrupted by the monsoons in the Indian Ocean. These periodical rains typify blessings and calamities which follow each other in somewhat regular sequence; while the regions subject to an irregular fall of rain receive less blessing at one time, but are not so frequently visited by heavy calamities: this is especially the case with Great Britain, which does not receive such great gifts in the way of abundant crops as some other countries, but whose crops are less liable to fail than any, principally because our rainfall is more regular as regards its annual amount.

Sunshine may be taken as the emblem of enlightening influence, while rain is that of resources come down from above, which the sun's light and heat enable the earth to use.

The earth is divisible into zones and districts more or less favoured. A rainless tract of land extends almost from the West Coast of Africa to beyond Irkutsk and lake Baikal. This region is desert except in the immediate vicinity of large rivers. It is somewhat broken in one or two instances by mountain chains, which STAND, LIKE THE PROPHETS OF OLD, WITH SNOWY HEADS TO INTERCEDE WITH THE ALMIGHTY FOR THE DESERT LAND.

These barren tracts consist greatly of plains or low hills. The rainless districts are types of countries under a curse. They are of pretty equal extent in Asia and Africa; but the greatest desert in the world is admitted to be the Sahara, the type of African backwardness, as regards civilization. It is

accompanied in some cases by great spiritual darkness and a desert of neglected duty. The Sahara skirts Algeria, Barbary, and Libya, countries which, from their belt of fertile coast-land, may be said to have enjoyed great advantages, as their populations, the Berbers, Moors, and Carthaginians, did. They turned their backs on many a conquered country, "and left it a desert:" they live with a desert at their back.

The land of Egypt is blessed with a great river, which carries to its delta alluvial mud, the foundation of the fertility of Egypt. Thus the overflow of the Nile has supplied the deficiency of the rain from heaven: such is a type of the civilization of Egypt, of an earthly character, compared with that of Palestine, which was so much more elevated morally. The country enjoyed much more of the "rain of Heaven." A great portion of Babylonia and Persia is desert of this character: they enjoyed little spiritual enlightenment. The desert places in Persia, barren and desolate, are indicative of gross darkness; such accompanies the worship of Yezidis, and of the tribes who wander through Chinese Turkistan and Mongolia.

A great part of southern and central India has either no rain at all, as in Scinde, particularly at Kurrachee, or a small amount, such as 25 inches yearly, as at Beejapore. This alone without irrigation cannot induce fertility in a tropical climate. The bulk of India suffers from too little rain, and it is a country which above most others calls for irrigation. This deficiency of rain in some parts, and abundance of it in others, indicates various degrees of blessing, showered upon the different Nationalities in India.

The regions of most of the Republics of South America have the least rain on that continent, such as La Plata, Peru, part of Chili, a great part of Mexico, Guatemala and Venezuela, in which latter place the annual rainfall is 7.52 inches. This appears to be significant of little favour from heaven, these Republics being left to "their own wicked devices" in most cases. In former times, when they were European colonies, things were not very much better.

The Cape of Good Hope has not progressed in the same proportion as other British colonies, probably on account of the large amount of desert in the interior, and the but moderate rainfall. The tribes who inhabit southern Africa show analogy with their climate and soil. Thus the Bechuanas produce less, and are less valuable as servants, than Congo or Eboe Negroes; but live in a more moist and fertile country than do the Bosjesmen, who inhabit one of the driest tracts, and are about the least promising of the savage races of southern Africa. The Caffre population is more intelligent, but perhaps not equal to that of Madagascar, which enjoys more rain, as a whole, than the Cape.

The land of the Negro races on the West Coast of Africa, which includes the country of the Joloffs and other tribes of Negroid descent, extends from the 18th° of north to below the 15th° of south latitude. This region is rainy, and stretches far into the interior, if not quite across the continent. This land is clearly intended as a theatre, for great deeds, not perhaps in arts and manufactures, but in the production of raw produce. But nothing can be achieved without great help from without. The deserts of Sahara must be bridged over ere much can be done for the civilization of Africa.

Much more rain falls in general on high mountains than on plains. It may be said to fall on the mountains for the benefit of the valleys, down the sides of which it flows by a torrent or a stream. The torrent or the stream represents knowledge descending from a pure and lofty source, to fertilize and refresh the world below. The streams which irrigate the valleys and the plains represent highly-gifted tribes, who assist inferior nations so much in the development of their resources.

The Temperature of different regions of the world is almost as varied as the rainfall, and has less to do with latitude than is commonly supposed, particularly in the northern hemisphere. The isothermal lines more follow those of latitude in the southern hemisphere, in consequence of the small amount of land. It is likewise much colder on the same insular grounds in proportion to latitude. Heat of atmosphere clearly typifies, as has been often remarked, degree of passion and emotional power in nations and individuals. The Arabs of the centre of Arabia, and the inhabitants of a considerable portion of Abyssinia, are commonly considered as amongst the most "fiery tempered" people on the globe. They are the reverse in this respect of the Teutonic tribes, who form so large a part of the inhabitants of the British Isles. The Arabs of Central Arabia, although living in the isothermal of July, 90° Fahr., with the inhabitants of Nubia, are more fiery than they. The Arabs belong to a purer division of the SEMITIC-EUROPEAN race than do the Nubians, who are largely mixed with the oven-dried, swarthy Hamites. It is possible for nations to be rendered less fiery by long residence in a hot climate.

"One fire burns out another's burning."

A moderate amount of baking renders food more pungent, but too long contact with excessive heat serves to destroy flavour, and reduce the whole to an inert mass. These divers effects of heat are also observed on nations.

An isothermal of 86° Fahr. in the month of July passes

Calcutta, Delhi, and Bagdad, through a great part of the Desert of Sahara, and on the confines of Egypt, and another line of 81° Fahr. passes through Borneo, Sumatra, Bokhara, Algeria, Morocco, Madras, Bombay, and a great part of Negroland. These two last lines include a great portion of the tropics. They indicate a great degree of heat, and typify "a hot-blooded population," such as that of Bokhara, Bagdad, Syria, Algeria, and Morocco, of the country of the Joloffs, of Bombay, of Madras, and India generally. These populations have all less self-control than those of Europe taken collectively, and are more inclined to fanaticism, and to be led by their feelings rather than by their intellect.

The West Indies, from the Antilles to the extreme north of South America, to the vicinity of New Orleans, and a great part of the southern states of North America, Yucatan, and Panama, possess a population excitable and more led by passion than that of Europe, but less perhaps than that of some of the hotter regions of the earth. An isothermal of 72° Fahr. in July may be drawn from California to New York, the Canary Islands, Madrid, the south of France, and the north of Italy. Here a population is found somewhat "warm-blooded," and "sudden and quick in quarrel," which becomes less conspicuous within the lines of equal July temperature as we advance north, until we reach the isothermal of 59° Fahr., which is that of the British Isles, Canada, Scandinavia, and Archangel.

The Irish form one of the few exceptions to what we have just stated, which must not, however, be understood to mean that the climate is the cause of this, but that the heat of the climate generally typifies as it accompanies the "heat of blood." The warmth and excitability of the Irish are probably occasioned by the vigorous "stirring up" they have received, which, amongst men as amongst liquids, increases heat. As in chemistry the mixture of two or more substances occasions heat during the process, so amongst human races the greatest amount of excitement follows the union of tribes, whose infusion acts like the addition of fermenting agents. The Irish, if descended from Milesius, would be of Oriental origin, and Asia Minor, from which they were believed to have come, has a particularly fiery climate in summer.

The further north we go, allowing for other influencing elements, the cooler it becomes, and the cooler is the population within certain limits until the frigid zone is reached, where the population is remarkably cold with regard to human feelings and sympathies; but the passions are not always so much under the control of the moral faculties as in more

temperate regions, where it would appear volcanoes are more common than in the north temperate zone, especially of Europe. The greatest power of feeling is occasionally concealed under a cool exterior. Hecla, one of the largest volcanoes in the world, is surrounded by a frozen crust.

Blumenbach, studying man physically and zoologically, divided him into five races, which he termed the Caucasian, Ethiopian, Mongolian, American, and Malay, or Polynesian. Yet these two last but one have clearly almost as much affinity with the Caucasian, Ethiopian, and Mongolian, or crosses between them, as have Gallas or Abyssinians with Scandinavians or Englishmen; or, again, as contrasted with Piedmontese, who are yet all classed as "Caucasians."

The term "Caucasian" is extremely unsatisfactory, and should be for ever dissociated with the range of the Caucasus, when applied to the great "CAUCASIAN RACE." The inhabitants of the Caucasus are clearly a branch of the *Turkish race*, an intermediate type between the SEMITIC-EUROPEAN and the Mongolian.

We use this expression, "Semitic-European," to designate the Hebrew, Syrian, Arab, and other Abrahamic tribes, and all other descendants of Shem and the Georgian race, together with the inhabitants of Europe generally, with the exception of the Finnic and Laplandish races.

Blumenbach's classification is especially unsatisfactory with regard to his American race, for the Araucans of South America differ as much from the Aztecs, or the "six nations" of North America, as do the Kalmucks from the Malays, and the different tribes of Negroes, termed Ethiopian, from one another. The Kalmucks, Esquimaux, and Chinese also greatly differ.

Whether we accept the theory of races, intermediate in character and physical appearance, between two widely-separated races, as a *hybrid* between them, or consider their qualities as inherited from ancestors equally marked, still physical resemblance, as a whole, points to filiation more or less remote. Such appears to connect these American and Polynesian divisions with the Ethiopian, Mongolian, and Caucasian; but mainly, perhaps, with the Mongolian. This division into THREE GRAND RACES appears in harmony with the nature of man. Difficulties attend every view of the subject, but this appears to present the fewest.

The form of skull is very generally taken by ethnologists as an index of race or the character of races; and advisedly, for certain forms of skulls always accompany given bodily shapes. If we divide mankind into three great races, we recognize in the

typical skulls characteristics as follows: In the Caucasian a well-proportioned oval skull, cheek-bones or zygoma of moderate height, and the chin well developed. The Negro form of skull is termed "prognathous," on account of the prominence of the jaws, which causes the whole muzzle to project. The head is long and narrow, and mainly developed at the base of the brain, and sometimes approaches the shape of a wedge. The Mongolian form of skull has been termed by Prichard the "pyramidal:" it is remarkable for the width of the zygoma or cheek-bones, which are frequently wider than any other part of the skull. It is often square or broad, but not apparently very large, yet of great cubic capacity, greater than that of many a skull which would look larger to the external eye. The hair is black, very coarse, and straight; the body is squat and of short stature, but long in proportion to the legs.

We shall now review the Mongolic division at greater length. It is the division of mankind most inclined to deceit, intrigue, and insincerity, but has much mechanical talent, so far as the "cunning" use of tools is concerned. The Chinese, the typical Mongoles, Kalmucks, Samoeids, Tunguses, Laps, Koreans, and Kamschatkadals represent the purer divisions of this race; while the Siamese, Burmese, Turks, Fins, and Magyars represent *mixed races*, or at least "intermediate types" between the Mongolic and Semitic-European. These may be called mainly of the Mongolic race, and the first-named list especially are greatly of the Mongolic type; but the Malays form an allied type, which, although created with special peculiarities, yet doubtless sprung from the same source as the true Mongoles.

The Malay race, with its subdivisions, possesses the high cheek-bones of the Mongolic. The head rises to a great height on the crown, but is not high at the centre, and somewhat low in the sinciput region. The teeth project like those of the Negro; the face is broad, somewhat flat, and certainly not angular. The frontal sinus is large and prominent. The men have very little beard. They average five feet two inches, and the women four feet eleven inches in height. The skin varies from sooty olive to bright brown or yellow. This absence of beard and presence of high cheek-bones proves them to be mainly "Mongolic" in their affinities; while the prominence of the lower jaw points to a connexion with the Ethiopian race. The Malay has some of the understanding and inventive talent appertaining to the Semitic-European race, without its steadiness and sense of justice and of the rights of humanity. The Malay character is a cruel, vindictive, and savage one. He cruelly tortures himself for the sake of distorting his person by

the tattooing process, and other devices are practised by him by which the human frame is marred. He files his teeth and enlarges the lobes of his ears. He is guilty of cannibalism, and preserves the heads of his foes as trophies. He is devoted to the sea, and is, for a savage, a skilful navigator. His subdivision, the Polynesian, possesses the most ingenious fishing tackle in the world. The Malay proas are among the fastest sailers and the most smooth-going craft afloat: another argument for the great mechanical skill possessed by the race.

The three great human races may be characterized thus: the Semitic-European, or the moral, intellectual, and theological race; the Ethiopian, sensual, servile, uninventive, but strongly domestic; and the Mongolic, mechanical, deceitful, hard-working, avaricious, but with weak domestic propensities, and the least to be relied on of the three.

The aboriginal inhabitants of the continents of America possess skulls which more approach those of the Mongolian race than they do the Semitic-European or Ethiopian. Their physical aspect shows analogy to the different Mongolic races of Asia.

The Thibetian race inhabit Thibet, Ladakh, Bootan, and little Thibet. The religion is variously Buddhist, Brahmin, and Mohammedan. The language is monosyllabic. These regions are all more or less elevated, Thibet in particular. It is under the dominion of China. Its elevated situation in the neighbourhood of a great mountain chain, the tops of which are crowned by perpetual snow, gives to it a rigorous climate, notwithstanding its situation from the 27th° to the 32nd° of north latitude, which is inclusive of all those before-named countries possessing a Thibetian population. The inhabitants of high lands are more commonly enthusiastic in their religion than those of low lands. The theology of the latter is more generally of a material and less complicated character; allowance of course will have to be made for difference of race and other circumstances. Thibet is a land of priests and temples, devoted to the Buddhist worship, to the adherents of which it is a sacred land; a land calculated, from its geographical situation and elevation, to look down, as it were, on China and India on both sides of the Ganges. The inhabitants are pastoral in what is temporal as well as in what is religious, and very suitably have a fine race of dogs renowned throughout the East for their size and strength. The grunting ox or yak is one of their chief animals; it is allied both to the sheep and the ox, and may be a type of a nation whose religion occupies a place between Brahminism and Mohammedanism. The musk-deer is one of the principal objects of pursuit in that country. Its odorous

pouch is collected with the utmost care, and its perfume is the most pungent of the odours of the East. Like Buddhism, it scents the whole East, and most strongly too, stronger than the sandal-wood typifying Brahminism, or the spicy fragrance of Mohammedan incense. Buddhism is more extensively practised than any other religion on the globe, and Thibet is its centre.

The Chinese race is a more nervous division of the Mongolic race than those which inhabit countries farther north. They have less physical force, but are more civilized, and have more intellectual activity than either Tartars or Kalmucks. They have made considerable progress in arts and letters, but their mechanical use of them, their not being able to comprehend the principles on which they are founded, leads to the belief that they were in early ages influenced by Semitic-European nations, possessing higher qualities, who were unable to teach them more than the "mechanical performance" of science and art, which must have been brought to their present comparatively high state of perfection by progressive steps, which would involve *progressive minds*. Such the Chinese do not possess.

"China proper" is a vast country, elevated in the north with large fertile tracts of table land; in the central regions watered by the Hoang-ho and Yang-tze-kiang. High mountains and lakes abound. The climate of China is hotter and colder than Europe is in the same parallels. This extreme of heat and cold may typify a cruel and at the same time a cowardly people. There are no active volcanoes in China, significant of a mild and tractable population, amongst whom revolutions are rare, and generally proceed from the decay or rottenness of the government, which allows decomposing matter to accumulate until a hotbed eventually produces spontaneous combustion.

China is a land of gardens and flowers. Here the most gorgeous shrubs grow to the size of the forest trees of Europe, and gardening has been pursued for centuries in accordance with a systematic design. The colouring of their houses and manufactured articles is pure and bright, like flowers, like birds, like insects, and not like the subdued hues of a landscape, such as the *ateliers* of Europe emulate. Chinese colouring is inspired by the natural objects in China and by the Chinese sky. The people have pretty accurate notions of colour, and some skill in combination, but their perspective is influenced by their wrong ideas of the comparative relation or importance of objects to each other. This view, in the first instance, led their teachers to imitate in a distorted manner the proportion of objects. These grotesque models were probably introduced in an age which would be considered "rude," when viewed in relation to modern civilized life.

The Mongolic mind, apt to dwell on what is monstrous and fantastic in nature, or in ideas of nature, is exemplified in the arts of China, which give "a bird's-eye view" of its inner life. Elegance of design is less understood by them than elaboration. Their sublimest arts are porcelain and *papier mâché*, or disproportionate carvings in wood, jade, or ivory, tesselated enamels on copper, or a fantastical roof or trellis-work; but of simple grandeur or pure taste in form they have not the least idea or appreciation. Their tastes are artificial rather than natural, and grotesque rather than artistic. They exhaust ingenuity in carving ivory balls within each other, and yet want the power of making a watch which can perform accurate time. Notwithstanding their love of what is exhaustive of useless ingenuity, the Chinese are generally a shrewd and economical people, who carry the management of resources to a point far beyond that of any other nation, ancient or modern. This is particularly true of the poorer classes, who may be the most practically wise, while the rich spend their means lavishly in the encouragement of the arts and manufactures for which China is so famous in the western world. A Chinaman is the shrewdest bargainer in the world, so far as shortsighted shrewdness goes, and the most indefatigable collector of rags, bones, and bottles, or feculent matter, which latter is with him an affair of dire necessity, as the sole means of supporting an exhausted soil. The cultivation of each plot of ground, even on the high mountain ranges, is practised in accordance with a strict sumptuary law. Such a law, however, argues uncommon thrift and industry in the race, urged forward perhaps by necessity. The soil of China yields to this resolute pressure abundant crops, but scarcely sufficient for the somewhat over-populated country. The Chinese, unlike the scrupulous Brahmins or Mohammedans (we of course except those of these persuasions residing in China), are almost as omnivorous as their own swine, to whom they show some approximation in expression of countenance. They appear to have availed themselves of the permission given to Noah, "Every moving thing that liveth shall be meat for you; even as the green herb have I given you all things" (Gen. ix. 3). These omnivorous tastes are accountable for the disappearance of most animals in China, mammals as well as serpents. The balance in nature is destroyed, which may perhaps have somewhat to do with the extreme unhealthiness of the climate of China; for the different classes of animals not merely serve to keep one another in check, but to render the air more pure.

The climate of many parts of China, among the most unhealthy in the world, is greatly caused, doubtless, by the heat

of the sun, which occasions the rapid decomposition of organic substances, which in the dry season cannot so readily enter into new combinations (that is to say, form part of the bodies of animals or higher vegetables); and thus the air is poisoned by the presence of recently-decomposed elements from dead animals and plants. This is not so much the case in the less highly-furnished southern hemisphere. Most Europeans who remain long in China return home with broken constitutions. Many of the Europeans lose their nice sense of honour by a long residence in China, the unhealthy moral atmosphere affecting a great many persons more or less.

The Chinese live much in the past, and magnify greatly their ancient history, traditions, customs, and ancestors. The Chinese object to the use of milk, and have little of the "milk of human kindness." They are a lively, gay people, who have little regard for human life. This would be in harmony with an unhealthy region.

The races who inhabit India beyond the Ganges, resemble the Chinese in some respects; they are intermediate between them and the Semitic-Europeans, at least in physical appearance. They are more good-natured than the Chinese, but have much of their avaricious and cunning character. The country is less densely peopled, and the population is less civilized, and has not been able to extirpate the larger animals so nearly as the Chinese, who have eaten up almost all the animal life of their land; and have turned all their flesh into human flesh. This they now support on a vegetarian diet; hence they may be said to vegetate.

The Indo-Chinese races are sensual and gluttonous; their arts and sciences are behind those of either India or China. They still have the tiger, the elephant, and the rhinoceros in great abundance: in this the country resembles Hindostan. The Anamese, Siamese, Kambojians, "the Mon," and the Burmese, possess monosyllabic languages or dialects, and the Buddhist religion.

The soil of Burmah is highly fertile, and much rain falls. It is one of the most unhealthy countries in the world for Europeans, but is rich in minerals as well as in animals and plants. It is an unprofitable province to the British; a grave to her soldiers, and equally a grave to her rupees. These great advantages and disadvantages connected with the country, are somewhat typical of the nation; they possess many excellent and useful qualities, but are withal somewhat treacherous, in common with the whole Mongolic race.

The Samoieds wander on the shores of the Arctic ocean, from the river Petchora to the Yenesei, and further south on the Altai

mountains. They are a barbarous people, given to demon worship,—"Shamanism." They occupy themselves with fishing, hunting, and soothsaying.

The Ostiaks are a fishing tribe, and are also of the Shaman religion, which is the most general faith among the northern inhabitants of Siberia. They are stunted in growth, like the vegetation of their land, by the intense cold. The Laps of Europe, and a portion of the Ostiaks, profess Christianity; but it is Christianity in a very rudimentary, carnal, and material state. Although sincere in their belief, their narrow moral capacity does not admit of their entering into its sublimer truths, or even into the less spiritual faiths of Islam and Buddha.

The Fins of Russia are a refined division of the Mongolian race, and have been considerably mixed with the Scandinavians in Sweden. The physical form of many of the Swedes evidences this. The Fins are mostly under Russian influence: they have much energy, extraordinary obstinacy, and imperturbable gravity. The country is flat and marshy, the soil is fertile, but the summers are too short to ripen southern fruits, or even wheat. Barley and rye, however, flourish, as well as the potato. This food typifies the imperfect manner in which they receive Christianity, and their inferior tone of morality as contrasted with the Scandinavians. The Fins live much on fish, and are dirty in habits and strong-smelling in person. They are a race which approaches in many of its characteristics both the Semitic-European and Mongolian; and their geographical position is intermediate between the Teutons on the one hand, and the Laps and the Samoieds on the other.

Nations who live on fish are more degraded than those who live on the flesh of wild animals; while those who live on wild animals are less elevated than those who live on the flesh of domestic animals and cereals. SAVAGE OR WILD FOOD, IS FIT FOR SAVAGES.

The Magyars, who at present inhabit Hungary, have been assigned an origin similar to that of the Ostiaks of arctic Russia. They clearly do not represent that race at present, being so different in appearance. The Ostiaks are a feeble race (according to Pallas) of little capacity, while even the Magyar section of the natives of Hungary possess great latent power under a cool exterior. About the mass of the Hungarian population there is considerable mental lethargy, and a disinclination to initiate improvements, which has neutralized to a great extent the extraordinary advantages of geographical position, fertility of soil, and mineral wealth, which might have enabled them to dictate to, and rule over, central Europe. The natural wealth of Hungary has not been in the hands of a population capable

of turning it to the fullest account. The Hungarians are, nevertheless, a fine people, and have been I think most unfairly classed with the Mongolic race, with whom in moral character and physical appearance, they have little in common. They are not an obstinate race who improve slowly like the Fins and the Laps, but are a superior race capable of great and rapid improvement. The Magyar, like his country, possesses great powers of culture, and is capable of astonishing the world by his mental, as his land can by its vegetable and mineral productions. Like his rich soil, he only requires "to be stirred up" to produce transcendant fruit. His land might feed a third of Europe, as well as make it drunk with the strongest wines, in return for manufactured goods from western Europe. The soil is not *hungry*, the population is not *hungry*, EXCEPT FOR CONSTITUTIONAL GOVERNMENT.

The Turks of Europe were originally a Mongolic race of nomad habits; residing in Mongolia, from the Altai mountains to the great wall of China. The Kirghis are believed to be a division of the Turks; they are mainly Mongolic, but approach the Semitic-Europeans in being bearded, which is more strongly marked in the Osmanli Turks who have intermarried somewhat with the inhabitants of the Caucasus, and show great approximation in facial angle at least, to the European type. The skull still maintains the Mongolic shortness, but the race has increased in height. The European Turks possess but a moderate share of intellect, and even that has been very little developed. They have less mechanical skill than other European nations, or power of understanding first principles. Their obstinacy and self-conceit greatly hinder their advancement in knowledge and the arts. They have strict notions of honour, to which they adhere more frequently than do most nations of the East. For commerce and arts they have less aptitude than either Arabs, Chinese or Greeks.

Pride, courage, the influence of geographical position and the balance of power, have alone given them a place, and maintained it, among European nations so superior to themselves intellectually as Greeks or Albanians are, yet inferior morally, although they profess belief in a religion more favourable than Mohammedanism for the development of morals.

Much of the soil in Turkey is extremely fertile; the surface is subject to undulations, and mountain chains traverse it; but not of great height. They may typify the present elevation of the Turkish empire, which the snows of Ararat by their superior height represent "in bygone days." Ararat stretches as far above the mountains of western Asia, as the Turkish empire formerly did above its present height. The Turks have,

properly speaking, no place in Europe; their "ethnic centre" is in Mongolia; they do not therefore harmonize with the geographical peculiarities of their present habitat. The wild boars of the land and its wine they may not touch. The country is more agricultural than manufacturing, in common with most countries which do not produce coal. Our last remark applies to European Turkey.

The Mongols who have been accepted as a type of the Mongolic race; as one of the most marked tribes of the family, are not probably the purest of all. The physical characteristics of this race are a broad, flat face, particularly at the nostrils and cheek-bones, with a forehead narrow on the sinciput, so that the visage is almost triangular, from the cheek-bones to the chin, and of the shape of a lozenge when the whole full face is viewed together. Their legs are feeble and crooked inwards; being formed seemingly to fit the saddle. Their hair is black and coarse.

The Polynesians and inhabitants of the Indian archipelago appear to consist at least of two races. Some ethnologists, as Mr. Prichard, in his "Physical History of Man," think of three races, namely first, the Alfora race, consisting of the inhabitants of New Guinea and the Philippines; secondly the Pelagian or Papuan Negroes; and thirdly the Malays. The Alforians are most likely a branch of the Malay family: their hair is sometimes curly, and approaches that of the Papuan Negro.

The natives of New Holland are deficient in the mechanical skill possessed by Malay races generally; they have not the strong domestic affections so general amongst the Negro tribes. They are feeble as a race, and are fast dying out. They appear almost incapable of even an approach to civilized habits, and have as few of the qualities common to man, that elevate him above the brute, as any race on earth. No portion of the world so large as Australia is inhabited by so depraved a race; not one of this size contains so much desert land in proportion to its extent. It contains the most debased fauna of any country in the world, and is destitute of large carnivora and birds of prey.

New Zealand possesses a very extraordinary fauna; it is almost destitute of indigenous quadrupeds and reptiles, only a few birds remain. The Moa, the grandest of its class has passed away, the type of the former vigour and strength of the Maories. The Apteryx passing away represents their present state, it will soon be extinct; like them its haunts to be occupied by the rooting pig of Europe. The discovery of the precious treasures of the earth by European settlers is significant and emblematic of the future of these islands, and of the high

rank they will take in the history of the Southern Hemisphere.

Papua, or New Guinea, receives its last name from a supposed resemblance to Guinea in Africa. It is likewise inhabited by a woolly haired race, and is a rich tropical country, the metropolis of the birds of paradise. It abounds in the marsupial race of quadrupeds. The inhabitants are mostly a degraded race of cannibals: if Australia is in many respects analogous to Southern Africa, New Guinea is analogous to Equatorial Africa. The inhabitants are varied. The so-called Alfora race, the Pelagian or Papuan Negroes, and a race intermediate between these two, inhabit this little known island, which is one of the largest in the world. It is by some supposed to be the "Ethnic centre" of the Pelagian Negro.

CHAPTER II.

HARMONY OF GEOGRAPHY AND ETHNOLOGY—*Continued.*

RACES OF THE OLD AND NEW WORLD CONTRASTED—AMERICAN AND AFRICAN RACES CONSIDERED IN DETAIL—ETHNOLOGY OF BLUMENBACH—THAT OF EUROPE—THE BRITISH ISLES, AND THEIR FAUNA, FLORA, AND MINERALS—FAUNA AND FLORA OF EUROPE—MESOPOTAMIA—CAUCASUS—INDIA.

THE human races inhabiting America present a great analogy with those of the Old continent. In the arctic regions of both hemispheres, there are races which greatly answer to each other. In the old we have the Laps; and their analogues, the Esquimaux in America, nations of similar habits, morals and contour. The Fins, a xanthous race, are found in the East, and the natives of the Aleutian islands; Chenooks and other light-skinned tribes in the West. Skulls have even been found in Germany of supposed Fins resembling those of the Chenooks.

The Mongols, Tartars, Tunguses and other wandering tribes present some analogy to such nomad tribes of North America as the "Six Nations," but are a finer race: in fact the races of the Eastern are generally greatly superior to those of the Western hemisphere. The Mexicans remind us of the Japanese in their high state of culture; while the natives of Yucatan, further south, answer to the Chinese. In the natives of the more tropical Peru, we find some analogy to those of India. The cannibal Caribs remind us of the Malay race; both are devoted to the sea and are skilful in the management of the canoe. The docile natives of Hayti and the West India islands, showed much of the slavish and submissive dispositions of the Negro. We in vain look for any analogy between the aborigines of America and the higher branches of the Semitic-European race. This correspondence between the races of the Eastern and Western Hemispheres, is mostly with the Mongolic division, and is a great argument for the common origin of these races, but in the above superficial view of the subject, we would call attention to an *analogy*, not a common derivation.

We have said that the animals and plants of America, are less vigorous than those of the Eastern Hemisphere, in harmony

with the comparative inferiority of its human population. The Western Hemisphere is more the land of vegetables than animals. That is to say the relative proportion of large animals to large plants is much in favour of the plants: the exact converse of what prevails in the Eastern Hemisphere, and especially in Africa. America is more a land of timber trees than the Eastern Hemisphere, which produces more choice fruit trees, but fewer trees abounding in rich foliage.

Let us contrast the animals, as we have already done the Human races inhabiting the two hemispheres. The four-handed animals placed next in some systems of zoological classification to man, are smaller and less powerful in the New, than in the Old world. The lions of Asia and Africa, are giants compared with the puma of South America; as the tigers of Bengal are to the jaguar. As the great bats of Madagascar and India are to those of America; although the bats of America are in more ill repute for their thirst for blood than those of the East. The camel is greater than the lama of the west; the elephant than the tapir; the African buffalo than the buffaloes of North America; and the Marsupialia of Australia are larger than those of America.

The crocodiles of Africa are larger than the alligators of South America. The poisonous serpents of the Old world are more venomous than those of the New. The birds of the Old world exceed in size or ferocity those of the New. The *Rhea Americana* is small compared to the ostrich, as the turkey is to the larger bustard. The *lammergëyer* of the East is superior in courage, although inferior in size to the condor of the West. The pigeons of America are smaller than those of the East, but the Macaws of America, far surpass in size the Eastern members of the parrot family. This last is one of the comparatively few exceptions. America is however more a land of birds than the East, as it is of insects. But yet *large* insects are as well represented in the East as in the West; the most energetic families of insects especially; namely the beetles and the Orthoptera, which class includes the locusts and "the walking-leaves;" they are larger in Africa, and do more mischief than in the Western half of the World. The *Chama gigas*, or giant clam of the Eastern seas, is larger than any shell of the West. The *Rafflesia* whose flower measures two feet wide, exceeds the dimensions of that of any American plant, as the Jaca fruit does those of any American fruit, if we except the pumpkin, which attained its monstrous size, first in the gardens of "Brother Jonathan," who himself belongs to a race of the Old World.

The inhabitants of America possess qualities which even more harmonize with the geographical features of the country

than do those of the Eastern hemisphere, which is generally milder, cooler, but less intensely cold than is the Eastern in similar parallels; but is at the same time wetter. It enjoys a great variety of climate, arctic, temperate and tropical. The fauna and the flora, are less vigorous on the whole than in the Eastern hemisphere.

Arctic America is most probably bounded by the frozen ocean; but the limits of Greenland, one of its more northern divisions have not been ascertained. The interior which has been little explored, is believed to be one vast field of perennial ice. Snow is there found in every month of the year but July. Vegetation is scanty; the birch, the alder and the willow, with a few green vegetables, potatoes and corn, are the principal products. Igneous rocks abound. This inhospitable country is inhabited by a very few Esquimaux, of short stature, corpulent bodies, and small intellects. This mental poverty is illustrated by the poverty of the soil. The Greenlanders produce little, as does their country. They live on fish like seals, whose products form one of the principal exports of Greenland. The few Danish inhabitants may be almost reckoned as strangers there, and clearly belong to another "Ethnic Centre." The country of the Esquimaux extends along the shores of arctic America. The few trees and shrubs of Greenland that line the southernmost coast, which in summer appear "green spots in a desert" of ice, may be types of the few examples of the Scandinavian race living there, and especially of the missionaries. Arctic America possesses many trees, but the vegetables mostly belong to the Cryptogamia, excepting a few saxifrages and other flowering herbs. As the vegetation becomes more arboreal, as we recede from the North pole, the population becomes more intelligent, until the temperate regions are reached, when the vegetation assumes an evergreen character, at the latitude of 40° north of the Equator. This is the region where the tribes are most energetic, and is nearly parallel with the portions of Asia, whose population presents some analogy with that of America, living nearly in the same latitude.

America does not possess any aboriginal race, fitted like the Semitic-European to subdue a sterile soil, to extract bread from stones: or a race like the Mongolian family in the East, who appreciate property sufficiently to work steadily for it. The semi-arctic regions of North America, over which the Beaver, Copper, Strongbow and Athapaskan roam, is scarcely a country much adapted to the growth of cereal grains, if not quite beyond their polar limit. These tribes of Indians are little inclined to cultivate the ground, and were perhaps therefore allotted a country incapable of producing the superior grains.

As we descend further south to the latitude of the great lakes, we attain a country generally well watered, and possessing a soil frequently fertile. The winter throughout this region is arctic, while the summer is tropical. The climate is more healthy than that 10° farther south, and is equally favourable for the maintenance of energy in red and white men.

Mexico is generally admitted to be one of the most fertile divisions of the North American continent. Few countries indeed possess equal natural resources, mineral, zoological and botanical; but the climate is particularly unhealthy for Europeans. This unhealthiness corresponds with the morals of the population. An unhealthy tone of morals generally accompanies an unhealthy climate.

Mexico is more than ordinarily volcanic. Volcanic regions of the Earth, unless where very thinly peopled, are more subject to political revolutions than other countries. This is especially the case in Europe and America. Volcanic eruptions, hurricanes or earthquakes are less frequent in the neighbourhood of orderly, moral and civilized Protestant populations, than in the neighbourhood of Pagan nations as Japan and the islands of the Indian archipelago; or in debased Catholic countries, such as Portugal, Southern Italy, the republics of South America, or the immoral populations of our own tropical colonies.

Mexico has not been visited by quite so many physical calamities, such as earthquakes, as some other regions, the inhabitants of which are equally immoral. It has been dealt with in a different way; for the populations have been for a long time allowed to cut one another's throats. Mexico contains much elevated land, the plateau of Anahuac being 1,500 or 1,600 miles long. Numerous high mountains, among the highest on the northern continent of America are found there. Mexico itself is an elevated city, one of the most so in the world, being 7,471 feet above the level of the sea. This lofty height is emblematic of the wealth and power in civilization, to which the Mexicans had attained previously to their conquest by Cortez in 1521; and of the intellectual superiority of the Mexicans, as contrasted with the other tribes of North America. They cultivated the ground diligently, and practised mining, metallurgy and the setting of stones, and had attained to great skill in goldsmith's work. Their public buildings might be compared with those of Egypt, with the inhabitants of which they had some analogy; and possibly might be descended with them from a Hamite source. Their character reminds us of that of the Tyrians or Carthaginians, which was cruel and vindictive, notwithstanding an elaborate style of living. They had made much progress in science, were acquainted with the solar year,

and had a system of hieroglyphics to represent ideas like those of Egypt.

With some cleverness and intelligence, the Mexican race have a low standard of morality, and are not much credit to the Christianity they now profess. Their national character and condition is well illustrated in the animals of the country. The puma may represent the Mexicans before the Spanish conquest; and the jaguar after it. The grisly bear may represent the European settler in California. The tapir may represent the aboriginal working population, less effective than that of the tropical regions of the old world. The birds so largely used in feather-work, for which the country was so celebrated; by their gorgeousness of plumage, and exquisiteness of texture, typify the grace, the polish and natural elegance of the population.

The Peruvians were a very superior people at the time of the arrival of the Spaniards. They are a mild intellectual race skilled in science and arts, who recorded time by the aid of knotted cords:—most races do not mark time even with this measure of accuracy.

Their language was marked by many inflections; it was polished and elegant, and suited to the poetry and oratory they so much cultivated. Their religion was an elevated form of paganism, reminding us of the more spiritual systems of the East. They abstained from human sacrifices, unlike the Mexicans. They inhabited mainly an elevated, healthy region. The coast of Peru is the reverse. There is much sterile land in Peru, as well as much that is fertile; which may illustrate the good qualities and defects of the race. The country possesses great natural resources, which like those of the people are not developed to the utmost. The principal exports of Peru are gold, silver, quicksilver and cinchona; and more lately nitrate of soda and guano. Its rich copper ores are among the most valuable on the globe.

Mexico is the most prolific in natural resources of any part of North America, but has a population debased when contrasted with that of European countries, though still greatly superior intellectually to the other aboriginal races of North America. The Peruvian race occupies a similar place in South America to the Aztec in North America. No country of South America of equal extent is richer, but the empire of Brazil, by its greater extent, has attained to a higher position.

Peru is the manure heap of the World, from which less favoured nations fertilize their soil. Wiser nations consume their own fecula, and as much as they can get of the produce of other countries.

The Incas of Peru imagined themselves descended from the

sun, in which they remind us of the Rajpoots of Hindostan. They did not consider the sun the Creator, but the greatest of the works of "Pachacama," the Invisible Spirit whom they worshipped. This may be compared with the Worship of Zend.

The Quichuas or Peruvians, are short in stature and square shouldered, with broad chests. The men average only 5 feet 3 inches high according to D'Orbigny. This great size of chest is certainly adapted to a population inhabiting plateaux of from 7,500, to 15,000 feet above the level of the sea; for in these elevated regions the lungs are highly charged with blood, and consequently distended, and necessarily require a large capacity for their expansion.

The Araucans and Pesherais of Chili, and Terra del Fuego, are a warlike, indomitable race. D'Orbigny says they possess large wide heads, high cheek-bones, thick lips and short flattened noses; but the eyes are horizontal. Their complexions and hair, remind us greatly of the Mongolic divisions; particularly of the Malay subdivision, or the Kalmuck. The Patagonians are the tallest aboriginal race on the American continent, and are one of the very tallest races on the globe; even though we allow that their height has been much exaggerated by the earlier voyagers; yet they surely vastly exceed in stature, other tribes of South America. They have their analogues in the taller Polynesians, who inhabit temperate regions such as New Zealand. Temperate climates are more generally inhabited by tall races, than either arctic or torrid latitudes.

The Patagonians are described as sullen, fierce and unamiable; as greatly deficient in moral dignity; and are usually considered little capable of improvement. They have extraordinary powers of imitation, and show considerable talent for picking up languages. This facility in copying if applied to a superior race, might afford a hope for the ultimate amelioration of their condition; for at present they are one of the least promising of races as regards usefulness.

Some of our most cruel and worst characters approach the Patagonian type. They have a low forehead, black, lank hair, high cheek-bones, tall fleshy bodies, impassive, unfeeling, unintelligent mouths and eyes. This is the bilious lymphatic temperament, about equally mixed with a fair share of the sanguineous, but with very little of the nervous. The life the Patagonians lead is favourable to the maintenance of this debased type. Their food which consists greatly of mushrooms, fish and mice, is also of a debased character. The higher forms of vegetation are but feebly represented in Patagonia.

The Pampas of Buenos Ayres, are inhabited by a division of the Patagonian race, who are even more barbarous and cruel

than the natives of the coast, which is contrary to the evidence of Azara, who considered them as superior to the tribes inhabiting the sea shore.

The Caribians are a widely distributed family of races, extending through a great part of South America and the West India islands.

The Caraibs are an important division of this race, they resemble the Mongolian, especially that division of it that inhabits the Malay Archipelago, in their lawless, rapacious and cruel propensities, and tendency to crush and subdue weaker races. The Guarani and Tupi, who inhabit a large part of Brazil, are mild compared with the Caraibs, and are unlike them highly susceptible of the influence of civilization.

A very large portion of Brazil is densely wooded. It is "the paradise of plants," for here forests attain their greatest extent in the world. The borders of the Amazons and the neighbourhood of Pará, are especially rich in insect life; particularly butterflies. This region affords the greatest number of species in the world. The population lead "a butterfly life;" they work but little. The butterflies of Europe are few in comparison, and so is its idle, effeminate population. If these insects represent the aborigines, the humming-birds represent the mixed Indian and European population, or "Mamelucos." Casual observers doubt whether humming-birds, are birds or insects. By their minute size and graceful movements they almost persuade us that they are "winged gems," or the precious treasures of Brazilian mines sprung into life, ready to die to decorate the attire of the nymphs of that fairy land; and dispute with brilliants, with rubies and with aqua marines, the title of the brightest decorators of their costumes.

The coast line of Africa is the least indented of any of the continents of either the Old or New World. In harmony with this, its populations are less maritime than many races, although it must be admitted that the Negroes make better sailors than do most other uncivilized races; owing to their docility, strength, and power of adapting themselves to circumstances.

Africa is the land of great deserts, which stretch almost across it, cutting off the North from the centre and equatorial regions. This has been the chief bar to Moslem conquest and perhaps elevation through it, of the Negro "in the scale of being." This desert lying between different regions of Africa, may be typical of the want of sympathy and community among its races, which has prevented them from uniting to form great states.

Africa has few rivers of great length: the Nile is by far the largest, in fact, the only one which can rank among the great

THE PRIMEVAL FOREST OF BRAZIL.

streams of the world. The direction the outlet of rivers takes, is mainly that followed by their commerce and emigration. That of the Nile is principally North towards Europe. That of the small rivers in Algeria and Morocco is mainly towards France, Spain, Portugal, and Britain ; while that of the Niger, Senegal, Gambia and Congo is towards America, the direction the population took in its forced emigration.

Africa has few islands compared to America, Asia, or Europe, in harmony with which its populations have little extensive commerce by sea. Madagascar is its largest island and those of Socotra, Seychelles and Zanguebar are important on the East coast. The aboriginal commerce of Africa was mainly in the direction of, or in connexion with these islands. After the discovery or re-discovery by Vasco de Gama of the Cape of Good Hope, the western islands in the Atlantic, began to engross a great portion of the African commerce of Europe, being as it were half way between Africa and Europe. On the discovery of America, they were found to be suitable ports of call for ships bound to the West Indies, and the success of black labourers in the Canaries, was an inducement to their introduction into the American isles.

The mountainous systems in the interior of Africa have been little explored. If Asia has a chain of mountains denominated the " Mountains of the Sun ;" Africa as a less promising country has a chain more or less mythical denominated the " Mountains of the Moon." Is this region inhabited by Man ? We have all heard of "the man in the moon ;" his evidence we fear has often been admitted on a question like this, by superficial geographers and ethnologists.

A great part of the central regions of Africa is probably mountainous and well watered, but it is not generally a land of great lakes or rivers. Many lakes or rivers like those of Australia, become nearly or totally dry at some seasons of the year, and the largest, Lake Tchad, has no communication with the sea ; significant of the isolation of the "green spots" in central Africa, calculated to enlist the sympathies of civilized humanity.

The region of the great lakes of Eastern Africa, such as lake Marawi and Victoria Nyassa in the neighbourhood of the now believed source of the Nile, is a well watered country ; civilized compared with the less fertile South. Except in the neighbourhood of the greater rivers or the Mediterranean sea coast, Africa is very dry.

The North of Africa is particularly subject to the hot winds of the Sahara, they exert a blighting influence on vegetation, and are pernicious to man and beast, they render yellow in a

few hours, tender and succulent grass, or the delicate acacia. The hot winds have often been compared with the incursions of marauding tribes, such as the Kabyles, who leave their desert homes like a cloud of dust, and delight to reduce "to a desert" the most civilized villages of the coast. Like the Sirocco these marauding incursions are not of constant occurrence. Intervals of peace and tranquillity are allowed, during which the blade rises anew, and the buds expand into a luxuriant growth of leaves, and another numerous generation fills the gaps in the Human population. But for this, the Storm of Man or the "Elements," would wreak its cursing blasts upon a callous soil.

The great desert whose sand absorbs heat often to the extent of 130° Fahr., radiates it so rapidly during the night that water exposed to the wind in the clear moonlight may freeze. The inhabitants are both cold and hot blooded. Hot as the bird:—cool as the reptile. Prone to shed blood to the utmost in battle;—that is to say "in the hottest blood," as well as to massacre relentlessly in "the coldest."

The lion is distributed over most parts of Africa. The Barbary or North African lion, is said to be the most formidable, and the horse of North Africa is superior to that of other regions;—the "barbs" in particular: their masters are the most spirited of African people. The ostrich of North Africa is likewise larger than that of the South.

Egypt owes its fertility, for which it has been renowned from ancient times, to the Nile which has brought down much rich mud from more favoured countries; it has overlaid with alluvium the desert sand. This fertility in Egypt is *not of Egypt*, it is the spoil of other lands. The civilization of Egypt was probably due to the influence of races superior to the present Copts. The ancient grandeur of the kingdom, till lately contrasted wonderfully with its littleness; and it is only recently when Western blood and influence, like a Mediterranean breeze, began to revive the parched Egyptian coast, that it has sprung anew into life. This is a strong argument for the inertness of Egypt, except under the Influence of external pressure.

The Delta of the Nile, is so called from its resemblance in shape to the fourth letter of the Greek alphabet, which is triangular. May the form of this letter have suggested that of the pyramid? or may the form of the pyramid have suggested that of the letter? The figure of the pyramid is but the multiplication of triangles, and when viewed in front appears as one. Egypt has deserts on each side of it. In ancient times as in modern, its civilization was superior to that of the countries immediately adjoining.

The neighbourhood of metallic ores, or the possession of coal, greatly stimulates the industry of a nation, and when not found, neglect of metallic arts generally occurs. Egypt in ancient times was blessed with much civilization. The skill the ancient Egyptians attained in the use of metals was probably the result of teaching from abroad. The metals not being obtained in Egypt would not have found their way there, unless their uses were known; and their uses could only be known through long familiarity with them, which would involve successive experiments near the spot where they were found. WE HAVE HERE A CLUE TO THE SOURCE OF EGYPTIAN CIVILIZATION. The abundance of siliceous sand and salts of soda, obtainable in the natron lakes of this country, facilitated the manufacture of glass, which was perhaps earlier in use in Egypt than elsewhere.

Upper Egypt is not subject to rain, but in the Delta rain frequently falls from November till March; yet only on a few days. The water of the Nile is the most wholesome for drinking purposes, of that of any tropical river; this is attributable to the small amount of organic matter it encounters in its course.

Nations who dwell in regions at once hot and dry, are mostly divisible into two classes; the thin, wiry, muscular, active in mind and body; and the flabby in mind if not in person. Natives of temperate climates who live long in the tropics, are generally of either of these classes. The Arabs and Kabyles belong to the "wiry" division, and the Egyptians to the "flabby" and soft fleshed. The Negroes are somewhat between the two.

The great Berber race of North Africa, resemble in many points of character the Arabs of Arabia. The same love of freedom, the same lawless spirit, the same minute subdivisions of tribes, the same contempt for the luxuries of life, which is in harmony with nations living in deserts. There few comforts are to be procured, either on the spot or from a distance, owing to the great difficulty attending the transport of foreign luxuries over long desert tracts.

The Berbers of the Atlas chain vary considerably in habits. It is generally said that the Kabyles are incurably wild, and incapable of settling as quiet, orderly citizens. It is probable that they will not be reclaimed to any great extent, and brought within "the sheep-fold" of civilized life, until either the moral or physical desert, or both, "shall rejoice and blossom as the rose." Will Artesian wells—typical of French influence, with Christianity be a great means of accomplishing this?

The sea coast of Northern Africa, was early occupied by races, largely infused with the blood of the natives of the Arabian peninsula. The country they occupied was in some regions very fertile, but required culture. An extremely barren soil is

typical of a nation barren in the courtesies or the elegancies of life—the graces of civilization.

The richest portions of tropical Asia and America remind us of great resources and talents, either little used or abused; for the natives of these regions develop the resources of their country but little, compared with the races who generally inhabit the temperate regions of Europe. But a fertile soil, and some disposition to cultivate it, as is the case with North Africa and its inhabitants, aptly illustrate the status to which they might and did attain amongst nations, who cultivated letters, science and the arts. This was high when viewed from a mediæval stand point. It was wafted across the Mediterranean sea, like a scorching wind or "an army of locusts," which settled and increased in the neighbouring country of Spain, and threatened until checked by Charles Martel at Tours *Anno Domini* 732, to involve Western Europe in one Moslem yoke, in religion, politics and art.

Senegambia is a country of Western Africa between that vast region over which the Arabs and Negroid tribes wander, and true Negroland or Guinea. It is very rich in natural products, vegetable, animal and mineral. The inhabitants of it are various. Sierra Leone, the principal British settlement, being an *entrepôt* for tribes of almost all regions of West Africa.

The Senegambians are commonly considered three races: the Mandingoes, the Joloffs and the Fulahs. The Mandingoes are usually considered the most superior of the black races of Western Africa. Their features are straight, but their hair is woolly. They undertake long journeys by land, for commercial purposes. They are successful traders and diligent cultivators of the soil, but are too independent to make such submissive servants generally as the less superior tribes. They clearly cannot be classed with the Negroes of Congo or Eboe, who differ from them so much in physical appearance.

These Congo or Eboe tribes in features more nearly approximate the ape, than do the Senegambian blacks. They are more "ape like" in character, and have but a small proportion of those qualities which pertain to the higher races of humanity, but are lively, chattering, and inclined to mimicry; inconstant and easily led and duped. They are immensely observant about trifles, in contradistinction to the Senegambians, who are grave, quiet, persevering, somewhat melancholy and not easily controlled.

The Joloffs and Fulahs somewhat resemble the Mandingoes. Their states are larger than those of the tribes farther South. They pursue war in a more systematic manner, and less like wild beasts. The Fulahs in particular have had a prophet

with the audacity to imitate Mohammed in his foundation of a New sect, which like its great prototype carried on war successfully for the prosecution of its doctrines. How different are these traits of character from those of the tribes of Guinea generally, who however are not all reducible to the ideal Negro type. Tribes approaching in physiognomy the Mandingoes and natives of Soudan, are found at several points; these differ greatly in character, some being mild, docile, and affectionate, and careless about property; others are savage, cruel, bloodthirsty and avaricious, but more independent, constant and brave.

Guinea is the country of the largest land animals on the globe. Here does human nature vying with brute life, attain its maximum of savageness, and cruelty for its own sake. There is Dahomey with its periodical massacres or "customs," and slavery, unsoftened by Christianity and civilization. There the gorilla, the chimpanzee, and the koolo-kamba reign in the forest. There are the elephant, rhinoceros, hippopotamus, the ostrich and numerous birds of gigantic size, as well as colossal insects and land shells, capable of containing a pint of liquid. The Dracæna or dragon-tree and the gigantic euphorbias, illustrate the monstrous growth of vices in this part of Africa, as all this brute force does the vicious and savage strength of the human population. The lion, the largest of the Carnivora, is here, and in common with the bulk of these great brutes, has not been subdued by the natives. The extirpation of these creatures in Europe, is significant of the comparative subjugation of his worst and most savage passions by the civilized man; which now rage in Africa in unrestrained atrocity.

The Bushmen or Hottentot race is usually considered an abnormal one; their low stature and low foreheads suggesting a dwarfish division of humanity. Their complexions are yellow or inclining to clay brown. Their heads are remarkably flat on the top, if not concave in the centre. The forehead is prominent and narrow. The expression of the countenance is very unpleasant. They are a fierce warlike race, with considerable intelligence of a depraved character. Their cheek-bones are high, and remind us of the Mongolic division, whose roving habits they pursue. They clearly present a great analogy to the nomad Tartars, as well as some resemblance in physical and moral characteristics. Their language, which few Europeans can stoop to acquire, resembles the sounds uttered by animals, such as the pig, the duck, the goose, or the snake, all of which are uttered through the nose. Their senses are remarkably acute. They make war on man and beast with poisoned arrows, and are extremely irascible and violent.

Their food is frequently as depraved as their bodily habits. They eat locusts, snakes, beetles and terrestrial mollusca, or any animal indifferently.

The name *Kafir*, now applied to many tribes of southern Africa, was first given to these people by the Mohammedan voyagers, who thus designated *infidels*. The Kafirs of South Africa, are much more energetic and intellectual than the Negroes of Guinea are generally, and possess more elevated foreheads. They practise circumcision. They more nearly approach the Semitic-European race in physical appearance, than do the Negroes, particularly in the form of skull in the upper portions. Their moral character is superior to that of the Bushmen, or that of most savage tribes of Africa. They are Monotheists apparently, with superstitions added, such as the supposed presence among them of the souls of the departed:—they offer sacrifices to *Uhlunga* or a Supreme Being.

The nations that live beyond the tenth degree from the equator in Africa, are more commonly superior to those living within these limits. There are exceptions doubtless, as is the case with the Bushmen, who however belong to a division of the Human race whose "centre" is probably not in Africa. The Galla race so distinguished for energy is another exception. The Kafirs are apparently allied to them in character and in origin. The Gallas are a wild and ferocious race, who are the terror of the Abyssinians, and render the approach to that country from the Ajan coast so difficult. The Gallas are evidently a race intermediate, between the Arabs and the Ethiopians. The natives of Abyssinia are another but similar race. Abyssinia has been for ages converted to Christianity. The language greatly resembles Hebrew, and many of the customs and habits are said to be like those of ancient Israel. The Abyssinians are described as a melanic though handsome people. They inhabit high lands, and are superior to most of the races of the plains of Africa.

The Caucasian division of Blumenbach includes the so-called Indo-European and Syro-Arabian races, which are separated from each other by authors on the ground of difference of language. This race which we term SEMITIC-EUROPEAN can exist in every climate, unlike the Mongolian and Ethiopian types; but as a whole is better suited for a temperate climate. Its capacity for universal existence is however extremely significant; and the variety of qualities possessed by this race harmonize with varied regions. The Indo-European is a lingual rather than physiological division, throwing light on

history and migration, rather than upon the paternity of races, as language taken by itself commonly does.

The kindred Celtic, Teutonic, and Slavonic nationalities have long inhabited Europe, and have, especially the Teutons within the last few generations, emigrated to a great extent to extra European, but generally temperate regions of the Earth. The countries inhabited by these nations, are mostly temperate, and so are the passions of the people, especially as contrasted with those of Mongolian and Ethiopian races.

The Ethnology of Europe is not so varied as is commonly supposed. The Laponic race is the most Northern in its habitat. It is migratory like its congener the Mongolian, which together with most of the Northern and Central Asiatic tribes, clearly belong to one division of the human family. The Laps migrate much, and they have a wide extent of territory given to them in proportion to their population. They have high cheek-bones and wide shoulders, in common more or less with the whole Tartar and Mongolic family. The country is wild, rough and inhospitable, but adapted to a population who live almost entirely on the products of the animal kingdom. The animals of this country are coarse and ravenous in their habits, namely the leming and the glutton with an occasional polar bear. The latter may be regarded as a type of the Russian power, which rules in a great part of Lapland. The Laps are distinguished for activity, industry, obstinacy and shrewdness, but they do not produce great works. Similar remarks apply to the Esquimaux, who are however inferior in intellectual capacity to the Laps.

Scandinavia is a name old as the days of Pliny. It included modern Norway, Sweden, Denmark, Lapland, and Finland. But the Scandinavia of the theorists of the present day, includes only the three first named. It is a varied region. Norway is extremely mountainous, and much indented by the sea; it abounds in rivers and lakes. Very few rivers comparatively empty themselves into the northern ocean directly; the course of the rivers in Norway and Sweden being towards the more inland seas, as the Skager Rack and Kattegat; the Baltic and the gulf of Bothnia. The migrations of the Northmen have been mainly South West, namely to France, Britain and other countries in that direction; while those of Sweden have been more due South and East, to Germany and Russia. Norway is the land of mountains, islands, bays and lakes. The mountainous character of the country, typifies the independent disposition of the people; while the indented coast line, and

abundance of water, illustrate a maritime and aquatic population.

The Swedes are also a very maritime people. An eighth part of Sweden consists of lakes. Sweden and Norway are not manufacturing countries; the difficulty of communication between isolated districts, and the scattered situation of the population, have prevented the cooperation necessary to manufactures on a large scale. England and France do not suffer similar disadvantages. The Swedes and the Norwegians are

A NORWEGIAN FJORD.

great as individuals if not as communities. The more isolated men are, the more their individual resources are developed, and the less they are inclined to adopt the "manufacturing principle,"—the subdivision of labour—which is so favourable to the accomplishment of great deeds by a nation. Sweden and Norway owe their present position in Europe,—that of a power of the third class, to the unwillingness of their sons to sink their individuality, to become great as a community.

Germany is an extensive region, and possesses a considerable variety of animals and a varied soil. The population is mainly Teutonic, but a considerable portion is of mingled Teutonic and Slavonic descent. All the comforts, and most of the luxuries of life, are produced in this great country. The wild animals have not been so extensively subdued as in Britain.

Germany has no ocean coast line, and it is not much indented even by that inland sea the Baltic; hence its population is less inclined to marine excursions and foreign commerce, than those of Holland or England. Relations beyond sea are an outlet for the energies of a nation; they frequently prevent "intestine brawls;" by diverting the attention of prospective combatants.

Amongst carnivorous quadrupeds Germany has the bear and the lynx, which we do not possess.

The Germans have for ages been famous for their mining operations. They have dug deep into the earth, and extracted from its "bowels" rich ores, which after having been refined by the chymists, pass through the bowels of men into the earth again. They occupy important offices in society; they are useful or ornamental until they rust into dust. The Germans have a habit of "digging as deeply" into subjects as they do into the ground. The first step in any excavation is to cast up "dirt," which is the usual preliminary also to a moral investigation.

France is less gifted in minerals than Germany. She enjoys a more equable climate, but not so equable as the British Isles. In Germany the climate varies greatly; this may typify the varied character of the Germanic confederation, which "blows hot or cold," according to the season. France produces some of the finest fruits, flowers and agricultural produce known, which will become every year more perfect, as agriculture is more scientifically practised. France is not beset by great mountain chains like Spain. The rivers are mostly navigable throughout the greater length of their course. The greater rivers empty themselves into the Atlantic or the Channel, while only the Rhone amongst the larger rivers pours into the Mediterranean. The marine commerce of France is mostly in the direction of these great rivers, at least her export is. The country is little cut up by natural barriers to centralization. The French people in harmony with their natural advantages, cultivate the elegancies of life, as well as what is solid; to an extent greater than do most nations of Europe. They have not the strength and solidity of the more purely Teutonic nations, but are not so wanting in these as has been alleged. Their chief defect appears to be the not carrying of pursuits to a sufficient extent.

Spain is inhabited by a variety of races, who have been kept separate, greatly by the irregular course of the rivers, which admit of so little uninterrupted navigation. The mountains greatly split up the country. It was long divided against itself, and still provincial Cortes retain in the North their ancient privileges, having a chain of mountains as it were to guard them from the Grand Cortes at Madrid. Spain has great mineral resources and possesses much fertile soil, but at the same time much waste land, which may together, represent the moral state of the kingdom.

Russia in Europe consists of great plains interspersed with no mountains worthy of the name. This is significant of a want of elevation in the population; they may be energetic and industrious, but show a want of appreciation for poetry or loftiness of idea and thought.

The Dutch notwithstanding their great energy, are inelegant in their tastes, and in common with most nations who live on flat ground, have but little sympathy with poetry and romance.

The number of nationalities included under the Russian sceptre, is far greater than that under any other power, except Great Britain. A large portion of Russia in Europe is swamp, incapable of cultivation; and an even greater portion consists of Steppes, over which herds of cattle rove.

Italy being the most peninsular country of Europe, and having Spain on the West, and Greece and Dalmatia on the East, with Germany, Switzerland and France on the North; is cut off certainly by the Alps, but is still accessible. Italy is amongst the most central countries in the North-Eastern quarter of the globe; and Rome is nearly in the centre of Italy: hence WHEN EMPIRE STALKED WEST, IT AT ITS FOURTH STRIDE, SETTLED AT ROME.

Italy is intended to be a maritime country; but its population, except in the more Gothic provinces, such as Genoa and Venice, can hardly be said to be at home on the sea. There is much fertile land in Italy, but pestilential marshes abound. The climate may be said to be fine, but the lease of human life is in general much shorter, than in England or France.

Italy is a poor country, though rich in natural resources. The population cultivate art and science, more than they do morals or commerce; in harmony with which the vine, citron, olive, and other fruits, are more generally relied on than root or cereal crops: Sicily on the contrary is a great grain country. The pestilential swamps of Italy which have been so little drained, typify moral sores, which although they pervade many parts of Italy are most flagrant in the neighbourhood of Rome, situated near the Pontine, they should be called *Pontifical*

marshes. Much of the immorality of the population of Italy, is doubtless to be traced to Punic blood, which reminds us of the *Sirocco* or the *Libeccio;* unhealthy winds from Africa; for like Hannibal they bring desolation to Italy.

The British Isles are small in size compared with other European countries, and yet their position in the world of our day, is of the first importance. In geographical position they approach the main centre of present civilization. This location has much to do with the importance of the country, but a race trained in such a neighbourhood, would always possess advantages, over other races or divisions of the same race, farther removed from a great focus of civilization. The Teutonic division which includes the Saxon, Angle, Scandinavian and other minor tribes, is the race possessing most self-control, or balance of heat and cold. They inhabit the more temperate regions of the earth; and the more moderate members of these races, inhabit likewise the MOST TEMPERATE OF THE COUNTRIES OF EUROPE,—the British Isles. The less temperate in passions of the Teutons, are apt to go abroad and live in less temperate countries such as North America. And here their immoderateness would appear to have been increased by various combining agencies; doubtless partly climatic, as is the case with the European settlers in South Africa and Australia.

The strata of the British Isles are very varied, perhaps more so than almost any other region of the earth of equal extent. This too is in harmony with the varied qualities of the gifted races inhabiting these Islands. It is this combination—physical and racial, which forms the foundation of the renown of Great Britain. The present fauna and flora of Great Britain are on a moderate scale. There is no animal here that we cannot easily master with scarcely an effort. The dominion of Man is nowhere greater over the brute creation. It is true other countries possess animals of a larger size, which are slaughtered by inferior races; for man is always more or less superior to the brute; but in no country is his dominion so great or his position as master more apparent. A powerful brute population, we take to typify the more brutal and savage passions of Man. Its cruel ferocity typifies his, as its mildness and gentleness does. In a Millennium of righteousness and peace, the venom of the serpent, and the cruelty of the lion, are to be turned to harmless gentleness.

We have however in Britain a vigorous fauna, as contrasted with that of some other countries. To begin with our quadrupeds: we have at present no indigenous pachyderms, our pigs being of domestic breeds. The wild boar once among us, typified

a pariah population like the races now extinct, of which we have however indistinct traces. The pigs of foreign introduction, by their sensuality and grossness, eminently illustrate the degraded portion of our population, which however "yield the palm" to Africa, which possesses many large pachyderms and a population coarse, thick-skinned, and swinish in habits.

The Carnivora in Great Britain are at present small and insignificant, compared with those of other lands. The wolf has long been extirpated, but as might have been expected first disappeared in England, then in Scotland and lastly in Ireland. The fox, were it not preserved, would long since too have disappeared. It is a type of the "wire pullers," who are so much protected by society, contrary to its own interests; but with the view of preserving the balance of power.

The badger one of the most important of the British Carnivora, is a quiet nocturnal beast, but if much "badgered" becomes obstinate, and fights to the last, in which it becomes a type of a large class of Britons, who like to be let alone, but when ill used, can fight.

The otter, a type of the Scandinavian fishers of our population, is sparingly distributed. The weasel and martin family are but feebly represented in Britain, compared with some other regions. They thirst desperately for blood under all circumstances. Our cutthroat population is fortunately *small*, but still not *extinct*.

The Insectivora are better represented than other classes of mammals in Britain; we have hedgehogs shrews and moles, to the number of six or eight, which pick up our insects. These remind us of detective police, or those who assist in the protection of our revenue against fraud. Still they are small compared with those of other countries. When they are of great size, they resemble and typify excessive exactions on the part of government officials, who, like the large Insectivora of foreign lands, devour not merely insects, but higher animals. Insects may be taken for the moment to typify poachers, and those persons who are enemies to our supplies of provisions, while the larger animals, typify the producers of food. Those who keep them in check are like the officers of revenue, who in our country merely protect its interests, but in some lands, actually prey upon the best interests of the community.

The bats are the most numerous of our Carnivora but the least to be dreaded. Their small size is significant, and is emblematic of the less treacherous and more frank and open character of our population, than that of most other countries. Still we have our bats, which typify those who walk abroad during the shades of night, to seek their prey.

We are entirely destitute of Marsupialia or pouched animals, —the lowest of the Mammalia, which is highly significant and typical of the absence in our country, as in Europe, of the lowest races of man ; those who habitually commit what is unnatural, like the marsupials who bring forth their young prematurely as it were, if contrasted with the placental mammals.

The sole indigenous ruminants, are two species of deer. Several other species of this and other genera formerly existed ; some perhaps the companions in their wanderings of an early race of man akin to Mongols ; and whose disappearance before the march of more docile races or breeds of man and domestic animals is coincident ; and whose graves alike lie beneath the strata of authentic history.

The extant individuals of the genus Bos or bull, represent a rough strong race like the Fins, not now found in England or most parts of Western Europe, of whom traces exist, like those of the *Bos taurus*, or Lithuanian bison, and like it still point to Russia as the outpost of Mongolian influence. It is reflected from the West, yet has an organization truly Mongolic.

A great part of the inhabitants of Russia clearly belong to the "Centre" of the Mongolic division of the human family. But the present breed of bulls in Europe and in England especially, typifies the Teutonic race ; the finest example of which is "John Bull." These are tractable, having none of the wild ferocity of the untameable, semi-savage tribes of Asia ; but are like the agricultural bull or domestic cattle in so many respects.

The deer kind now existing in Britain in somewhat diminished numbers, may represent Celts, or at least that family of nations as contrasted with the Teutons ; and like them give way before the bull and his analogue. Our domestic animals are in themselves typical in an eminent degree. In a future chapter, sheep will be taken in accordance with the Scriptural idea, as representative of those eminent for piety. We have certainly the best breeds of sheep in the world as well as the most valuable missionaries : while horses, of which our breeds, also of the best, may represent the efficiency of our forces, civil and military. The beaver is gone along with the earliest human inhabitants of the marsh, and only one species of squirrel enlivens our woodland landscape.

We are less eaten up by Rodents than the inhabitants of some other countries. We have five mice and rats, and one dormouse. The domestic mouse, may represent the Welsh, the black rat the Saxons, and the Norway rat the Normans, who followed one another from the East at different periods, in a manner analogous to the coming of these different nations.

The voles or field mice to the number of four, are great pests, they are smaller than the rats. They are types of a foreign or vagrant population, who live at our expense, appearing to the casual observer to give but little in return. The hare and rabbit are by far the largest of British rodents, but are the most timid. Their skins and flesh are much esteemed. Owners of valuable property are frequently said by politicians to be a timid class, whether they reside in boroughs or in the country. Those who reside in the country are perhaps the most timid, or at least have been supposed to be the most afraid of the dangerous classes; but those who live in boroughs increase more rapidly, and are supposed to be greater enemies to crops than the more aristocratic hare and his type.

The various species of seals found on our coast represent its human fishers of Danish, Norwegian, or Welsh extraction, and by their various habits, typify those of these British tribes.

The birds of Great Britain are very numerous, and include most of the aquatic species of Europe, as might be expected, as part of the fauna of an Island; and is in harmony with a human population the most maritime in Europe. The birds of prey are well represented; the leading families being admissible as residents or visitors, either regular or accidental. The vultures have been once or twice killed here, but have no *home* in Great Britain. Their residence is properly speaking in those countries the prey of despotism; they being a type of despotic, Imperial rule, which has only occasionally visited Britain. British birds generally, are more distinguished for grace, nobleness of aspect, beauty of song and harmonious colouring, than for excessive brilliancy of plumage. They harmonize with our landscapes, which are varied, rather than extremely brilliant in sky, or in the tints of the blossoms of the earth. The rich luxuriance of the tropics, either in plant, bird or insect life, is wanting here; except in a few cases, or on a small scale, but yet there is much to admire, much to awaken interest, and encourage study and reward culture. Although the fruit may not grow to so large a size spontaneously, yet flavour may compensate much, and a great size be within reach of attainment, when an "Ossa" of culture is heaped on a "Pelion" of flavour. Then, and then only, things great and good will attain their zenith.

The various genera of British birds are typical of the inhabitants of the British Isles. The eagles represent royalty as the falcons do princes, while the large owls represent the gigantic "limbs of the law," and the crow kind attired in black the various learned professions; emblems which will be considered generically in our essay on birds. The song birds of England are

celebrated, but those of Germany even more so. The Germans prize singers amongst birds and men, more even than we do. We are more fond of song birds than the French; thus they are less destroyed by us. The small land birds of England are less numerous in proportion than the water birds; although perhaps not so much so, if we consider our area, as contrasted with that of Europe. This is especially true with regard to the larks, the finches, the buntings and thrushes, of which Europe possesses twice as many species as Great Britain; but the whole of Europe does not possess twice as many ducks, gulls or waders, which are all water birds, and point typically to our position at sea, as regards fleets, mercantile and naval. These buntings, larks and smaller land birds more emphatically represent the *bourgeois* and lower classes, who in the aggregate are of course far more numerous in Europe than in Britain.

The puffin and its congeners represent races who have passed, or are passing away. The extinct great auk typifies the early Mongolic population, while the razor bill and guillemot, do the outlying remains of Finnic tribes, who in remote corners of our islands still cling to primitive habits and usages.

British fishes are very numerous, nearly all those of the Northern seas of Europe are found here. If the sea birds represent the vessels, the fish which feed the birds, represent the crews, which would carry the illustration of a maritime nation still farther. Many types, connecting British fishes with the races inhabiting the British Isles, will be pointed out in the chapter more exclusively devoted to the finny tribe.

The reptiles of Great Britain are small and insignificant, compared with those of other countries. If reptiles are types of degraded men, we are fortunate in affording so few examples of both in our land. Tropical Africa and Asia abound most in reptiles, in harmony with which the human population has sunk lower than in most countries.

The insects of Great Britain are pretty numerous, but on a less gigantic scale than those of some other lands, and are less brilliant in tint; but in delicacy and harmonious colouring, are not to be surpassed. Most orders of insects are well represented; as might be expected in an island, whose strata are so nearly the type of The World.

The animals found in the British strata show this to be eminently the case. This is a subject of great interest and would be in harmony with the fact of the races inhabiting the British Isles, being the focus or concentration of the peculiarities of most other races. In the extinct animals which we shall treat of more at length in our chapters on geology, do we alone find the links wanting to complete types of universality which

are discoverable in our Island and its inhabitants. Thus we have remains of tigers, hyænas, elephants, rhinoceroses and other creatures at present natives of intertropical climates, which are doubtless the types of former human inhabitants, and whose remains turn up at the feet of an elevated race in the days of their civilization, and apparently point to peculiarities in the nature of man, from which he is never exempt.

The flora of Great Britain is eminently significant. Amongst timber trees, the oak, the fir and the beech, take the place of willows, which though common enough in Britain, are still more characteristic of the Northern regions of the European continent; while evergreen trees, with rich, thick and oleaginous leaves, such as the laurel, the orange, the myrtle and the cypress, harmonize with a climate where little frost occurs.

Nearly all our trees of any size shed their leaves every year; and every year they are renewed. This habit is very different from that of evergreen plants. The evergreen leaves so characteristic of the foliage of other lands, appear to illustrate an extraneous civilization; a life as it were less in the root than in the leaves, which if taken away the root dies. The plants which shed their leaves annually, typify the nations who possess a power of self-renewal. The sap goes down to feed the root to return with increased vigour the following spring. Of such a character is the elastic power of the Teutonic nations.

The oak is a preeminently Teutonic emblem. Its durability, hardness and incorruptibility are proverbial. It is equally serviceable on land as in water; like the Teutonic race as contrasted with the Celts, who may be represented by the beech. This wood will not stand great drought or water without loss of form; but is excellent as a wedge for splitting; or as rough handles for the tools of the Teutonic workman. It is apt to get cracked, yet does not split. The Celts like their analogue the beech, although often "tools" in the hands of the Teutons are uncertain; they are apt to be "warped."

Great Britain is eminently agricultural as well as pastoral, and its population like that of Europe generally, is mainly supported on cereal grains, and on wheat the choicest of the cereals, which typifies their great religious, moral and intellectual advantages. Wheat grows most commonly in countries, best suited for the maintenance of the peculiar gifts and high qualities, possessed by a Teutonic population. Some of the best pasture grasses known, grow in Great Britain and Europe; hence their availability for the feeding of a stock unrivalled in the world; and whose milk, butter and cheese are amongst the finest. These pastures represent physical advantages; that is to say of

bodily constitution, in contrast with the cereal grains which typify moral and intellectual advantages.

The flora of Great Britain numerous in genera and species, is more remarkable for delicacy and minute tracery than for grandeur or gorgeous colouring; typical of the modesty which greatly distinguishes the nation both as regards freedom from indelicacy and dislike of vaingloriousness. Many flowers will be alluded to in a future chapter, as illustrative of traits of character and virtues especially English.

The tendency to neglect the cultivation of the cereal grains and live on the potato, is typical of the lower moral standard of the Celts. They thus chose a food of a lower character as contrasted with that of the Teutons. The potato in contrast to the wholesome cereal families belongs to a poisonous class; that of the nightshades, which contains so many deadly plants. These poisonous properties are typical of a religion akin to paganism in image worship. Wholesome food is mixed with poison, which fully illustrates CHRISTIANIZED-PAGANISM. Right and wrong lie greater in use and abuse, than in the abstract: hence the importance of culture and balance, by which the controlling power of Man is shown. We owe less to climate and soil with regard to the produce of abundant food crops than do many other nations; more is left to skill and industry than in most other countries. The high qualities of the race are here developed by being called into exercise.

The minerals of Great Britain, illustrate national character in an eminent degree. Coal is one of our most important minerals, and is more abundantly found in the British Isles than in any part of the world of equal extent. This coal is a type of condensed energy such as the Teutons display; and which is more manifested, singularly enough in the coal producing districts of Great Britain, where the population have often coal black hair, as in South Wales, Northumberland and Durham. They are more energetic than in the Southern and Eastern regions, which produce no coal. Coal is a coarse, dirty mineral, but it contributes to diffuse a genial warmth throughout every district of the country. The colliers are generally admitted to be a coarse and somewhat gross section of the community, but those who visit them in their humble homes are likely to have "a warm reception." It is sometimes said that the bulk of British energy is "Northern;" and it must be admitted that energy and self-reliance are more common in the North and central districts of England, than further South. But with this great power, there is much "flame," "flash" and "smoke," typified in a "sea coal fire," as contrasted with a charcoal fire, which can be obtained from local material in

almost any place. This flame is clearer and hotter than that of the coal, and is much purer and more refined. It burns with little noise, flare or smoke. This is typical of the Southern man of energy, who is much more refined than his Northern congener.

Iron and coal so necessary to each other, are generally found in close proximity. The iron ore may here represent the physical surroundings of a nation, while the coal represents the nation itself. The Teutons are the principal workers in coal and iron throughout the World. Wherever they go they turn up coal, be it Australia, America, New Zealand or Borneo. The "charcoal iron" is the purest in quality, and being mainly made in Sweden, may typify the Scandinavian element amongst the ethnic forces of Europe; while the iron made with mineral coal typifies a coarser Saxon element.

The cast iron so largely prepared from the clay ironstone, exactly answers to the "Iron and Clay" of Nebuchadnezzar's Image, which we shall dwell upon in our "Chymistry of the Mind." It is from this IRON AND CLAY that the main greatness of the Teutons is derived. Gervinus is also right when he thinks that the toes "part of iron and part of clay," represent the Romanic and Teutonic nationalities, in the *locum tenens* of the Roman empire. The iron clearly represents centralized power, while the clay represents oligarchism;—and is by some thought to be a type of democracy. Such might be as true at one Age of the World, as the other might have been at a former period. The yield of ores in Britain is vast indeed. A large portion of the metal of the world is turned out of our soil; a very large proportion of the tin of commerce is British; a goodly amount of copper, zinc, lead and the less abundant metals. Also a considerable portion of silver and a little gold accompany the lead ores of Britain.

We are industrious rather than thrifty as a nation. Were our thrift equal to our energy and industry, we might absorb much more wealth than we do, and keep the whole world IN LEADING STRINGS OR CHAINS, WROUGHT OUT OF OUR OWN METALS.

We are famous for pottery and stone ware, as well as porcelain. The civilization of Britain may be read in its jugs and basins, from the period of the Celtic unbaked ware, to the modern productions of a Wedgewood and a Minton;—a compass the points of which connect ancient and modern history. The same may be said with regard to glass, and is more or less true of other departments of the useful and ornamental arts.

The British Islands do not yield so many heating, stimulating, narcotic, or sedative productions of the Vegetable

Kingdom, as do such tropical countries as India, central Africa or America, that produce the tea, the coffee and the spices of commerce. The Teutons are the least excitable of European races, if we except perhaps the Laplanders and their allies. But they of all European races, are the most fond of condiments and stimulants; of foreign substances which they introduce into the daily routine of their consumption. They are much less affected by them than the Celts, who cannot stand the same amount of alcohol or pepper with impunity, as the Teutons, who possess much more vital force. The Celts have within them a natural "pepperiness," and more "ardent spirits," and do not care to introduce such from without to the same extent as the Teutons. An indulgence which a Teuton could use and yet retain soberness, would make a Celt mad. The part of France where the indulgence in intoxicating liquors is greatest, is most Teutonic;—Normandy. The very moderation of the Teutonic character, is typified by so few of the natural productions of their temperate climate, being of a stimulating and exciting character.

The Cryptogamia or flowerless plants, have not their paradise here as in Arctic Asia, Europe and America. Significantly pointing to the absence of races of the most primitive and simple habits, such as the Ostiaks, Samoieds, Laps and Esquimaux. Their intelligence and civilization have not yet burst forth into bud or blossom, have not yet FLOWERED, but are in an Acrogenic state. We of course only here refer to terrestrial vegetation: the marine is Cryptogamic the world over, and exclusively so. The present Cryptogamic flora of the bed of the ocean, is indicative of an early or primitive state. It is analogous to some of the earlier strata of the earth, the age before that of flowering plants. "Progressive Creation," when applied to the bed of the sea, will result in the disappearance of a MARINE FAUNA and the probable substitution of flowering plants, far higher in the scale of creation. THEN THERE WILL BE NO MORE SEA.

The absence of palms in Northern Europe is highly significant; they supply within a narrow compass, more of the wants of Man, than any other class of plants. Food, clothing, furniture and shelter, are procured from one tree, and with little labour. Unlike that which involves the combination of a great variety of genera and species to produce, and with the utmost labour. Those plants most admired for their beauteous flowers, are in Europe not arborescent; neither are flowering shrubs so abundant in the North of Europe as in the South. In harmony with which, here less care is given to the purely ornamental than to the solidly useful. The flowering shrubs of

Southern Europe represent what is more exclusively ornamental and decorative in the position of ruler or governor. Show and display as a general rule, are more practised as we advance farther South.

The Teutons are less inclined to display than the Celts; and the inhabitants of Africa and India still more so than the Celts; and in the western hemisphere what is showy and gaudy, reaches its maximum of development in South and Central America,—limited means being taken into account. While the Canadians, who dwell in the coldest climate inhabited by the civilized population of the Western Hemisphere, are the plainest in their general style of living. Is this in harmony with the superior advantages of the sun which ripens glowing hues in natural objects, and induces Man to imitate their brilliancy in his works of Art?

The fruits of Britain as a whole, yield only to those of France and a few other parts of Europe, in glowing richness and delicacy of flavour combined; but their size is insignificant compared with the jaca, the mammee and the shaddock; yet afford as grateful qualities, and are more salutary than the more massive but less digestible fruits of the tropics.

Modesty is one of the most distinguishing characteristics of European nations as contrasted with the pompous Negro, and egotistical Mongol. In the lower ranks of European society, especially in those of the inhabitants of these islands, we see a luxuriant growth of modest virtues, which we may compare with the lowly strawberry, that rich fruit, the finest our land produces, but whose fragrance rises in wreaths to Heaven, the incense of the Earth.

The willow or catkin bearing trees, gradually usurp the place of the conifer or cone bearing trees, as we approach the arctic circle in Europe, and also to a greater extent in America. The seeds are greatly clothed with down, and in an early stage resemble the fur of animals; and is used by birds in the arctic regions as a substitute for fur, in lining their nests. Now these furry flowers, are eminently characteristic of regions producing many furs, but fewer fir trees.

A line running between the 60th and 70th parallels of North latitude is the Northern limit of arborescent vegetation. This line is higher in Europe under the influence of the gulf stream, and lower in Siberia, more especially as Kamschatka is approached. Beyond this line the vegetation is greatly Cryptogamic, and as we descend farther South, sedges and rushes abound, until they yield to grasses suitable for pasturage. The fauna of the continent of Europe is on a more extended scale than that of Great Britain.

As we proceed further South, we see a gradual approach to tropical vegetation. Evergreen trees and shrubs cast an impenetrable shade, which would be gloomy in less sunny regions. In the Southern parts of Spain, Italy, Turkey and Greece, one or two palms appear. These countries have in summer an almost tropical climate, and a portion of their inhabitants approximate in *indolence and immorality* to intertropical nations. The fruit trees of the South of Europe, or which flourish and luxuriate there, are uncongenial in Great Britain. The pomegranate, the orange and the vine, do not attain perfection in our climate without artificial heat; typical of the arts and manufactures of the South, which require to be introduced and cultivated with the utmost care, if they would at all compete with the manufactured articles of foreign introduction.

The poplar and the elm, characteristic of Northern Germany, yield to the lime in Eastern Europe, and to the chestnut, especially in France and Spain; while the home of the gloomy yew appears to be on the shores of the Black Sea. The South of Europe and Asia Minor greatly abound in the crown imperials, the tulips, the lilies and other bulbous roots. The nations who lived in these lands of flowers, were graceful and flowery in their expressions. Such were the Provençals of France and the Hebrews of Palestine.

The Dutch have been famous cultivators of bulbous roots, mainly to make money, but perhaps partly from a love of *multum in parvo*, or concentrated force in a little space. The growth of a bulb is like that of the Dutch, always expansive. In youth in height, in after life in girth; both individually and nationally. They find in these flowers whose growth is so regular, so certain and so little dependent on changes of temperature, a solace which contrasts favourably, with what otherwise might be gloomy in landscape gardening. The bulb by its mode of growth illustrates Teutonic progressive civilization. The Dutch division of the Teutons, put their feet forward slowly, but scarcely ever back; retaining tenaciously what they have once seized.

In Russia and Asia, especially in some districts, the horse chestnut usurps the place of the sweet chestnut. And here a human population, live greatly on *horse flesh.* The horse chestnut is a beautiful tree, but its wood is valueless, and its nuts although beautiful, are too astringent to be wholesome for Man's food. Many of these remarks applicable to the plants of Great Britain, apply to the plants of Europe; for the vegetation is of a similar character. The change is very gradual; willows, conifers, oaks, beeches, chestnuts and evergreen trees, form "zones," each suited to the climate. The fauna of Europe, is

also more extended but similar. No Pachyderms or Quadrumana, with the single exceptions of the wild boar and the Barbary ape, darken the gates of Europe: they typify Pariahs and Negroes, who rarely reside in its confines.

The domestic animals of the Continent are similar to those of Britain, and recall similar analogies. The lynx is one of the largest and most formidable of the Carnivora of Europe; at least of the true cats, but wolves and bears are much more to be dreaded than these. The lion was an inhabitant of Greece in classic times, but is now extinct; typical of the disappearance of the lion-like character amongst the Greeks. The characters of the wolf and the fox are plainly seen there, and these animals still inhabit the Morea. The hyæna once a native of Europe, has disappeared like the supposed primitive races its early inhabitants. The existence of three species of bears in the present day is instructive. There is the common brown bear of the Pyrenees, Spain and Switzerland. There is the black bear of Russia and Poland; and the white bear of the Arctic sea which sometimes visits Lapland. These typify ferocious and brutal races and governments.

A few more bats are found in Continental Europe than in Britain, but none of large size; yet some gigantic species are found in European strata. The Edentata or toothless quadrupeds and the pouched animals, are not European in a recent state, but the Rodents are an extensive family in Europe. Troops of lemings and hamsters migrate from the North to the cultivated fields of the South, where they commit great devastation, as did the Huns or Vandals of old. The birds of the Continent are on the whole larger than those of Great Britain; not so much in actual size, but as regards number of large birds seen at any given place. The same rule applies to the insects in the departments of butterflies, moths, beetles, grasshoppers, bees and wasps. This greater animal power on the Continent of Europe than in Britain, is perhaps merely the natural consequence of a larger territory, which can of course command more varied and greater force.

Mesopotamia was the cradle of the Children of Shem. It is a region of more or less fertility, but inferior in this respect to Egypt or Palestine: it is subject to great vicissitudes of temperature. Its races have been subject to great vicissitudes of fortune; but like the country have always been a focus of observation;—Mesopotamia is one of the centres of the East.

The Semitic Nations in all ages, have had vast privileges, Moral and Intellectual. They possess more evenly balanced minds than do most other races, which is typified by their

central position, and demonstrated in the extraordinary influence they have had over other races. The soil produces the fruits of a tropical and temperate climate.

All Mesopotamia is a plain. Now plains are favourable for great cities and high civilization; for the growth of luxury and the accumulation of wealth; but are less favourable than mountainous regions, for the preservation of purity of morals and the cultivation of a high order of theology: the religion of Sabi was inferior to that of Moses. Israel perhaps pursued the study of Egyptian theology for a time in the plains; yet were removed eventually to a mountainous region, lest they should be irrecoverably contaminated with the Mud of the Nile.

Babylonia and Egypt had some analogy; they were both tracts which owed their fertility to the branches of great rivers;—rivers which must be amongst the most important of streams as long as time lasts. Cities sprung up on their banks, which in their day influenced a great portion of the World. Palestine and Syria enjoy most of the advantages of Mesopotamia, without its disadvantages. The Creator in preparing a home for a race most specially favoured, gave to a land extremes of qualities, harmonizing with the extremes of qualities possessed by the race of Israel; for the Canaanites went before as pioneers to break up the soil, afterwards tilled by a race of far higher culture and nobler constitution.

The mountains of Palestine are extremely *high*, and the valleys are extremely *low*; significant of the exaltation and humiliation of Israel.

The fruits are especially rich, and attain great perfection. Palestine with proper culture, might produce every fruit the world produces in the utmost perfection; for Jericho and the low parts of the valley of the Jordan, enjoy a tropical climate. There the mango and the mammee might grow; while the Lebanon would yield the finest currants, gooseberries and strawberries, or other fruits of an Alpine or Northern temperate climate. Fruits that are starved in Northern Europe without the most careful culture; the vine, the olive, the nectarine and the orange, grow like luxuriant weeds in Palestine.

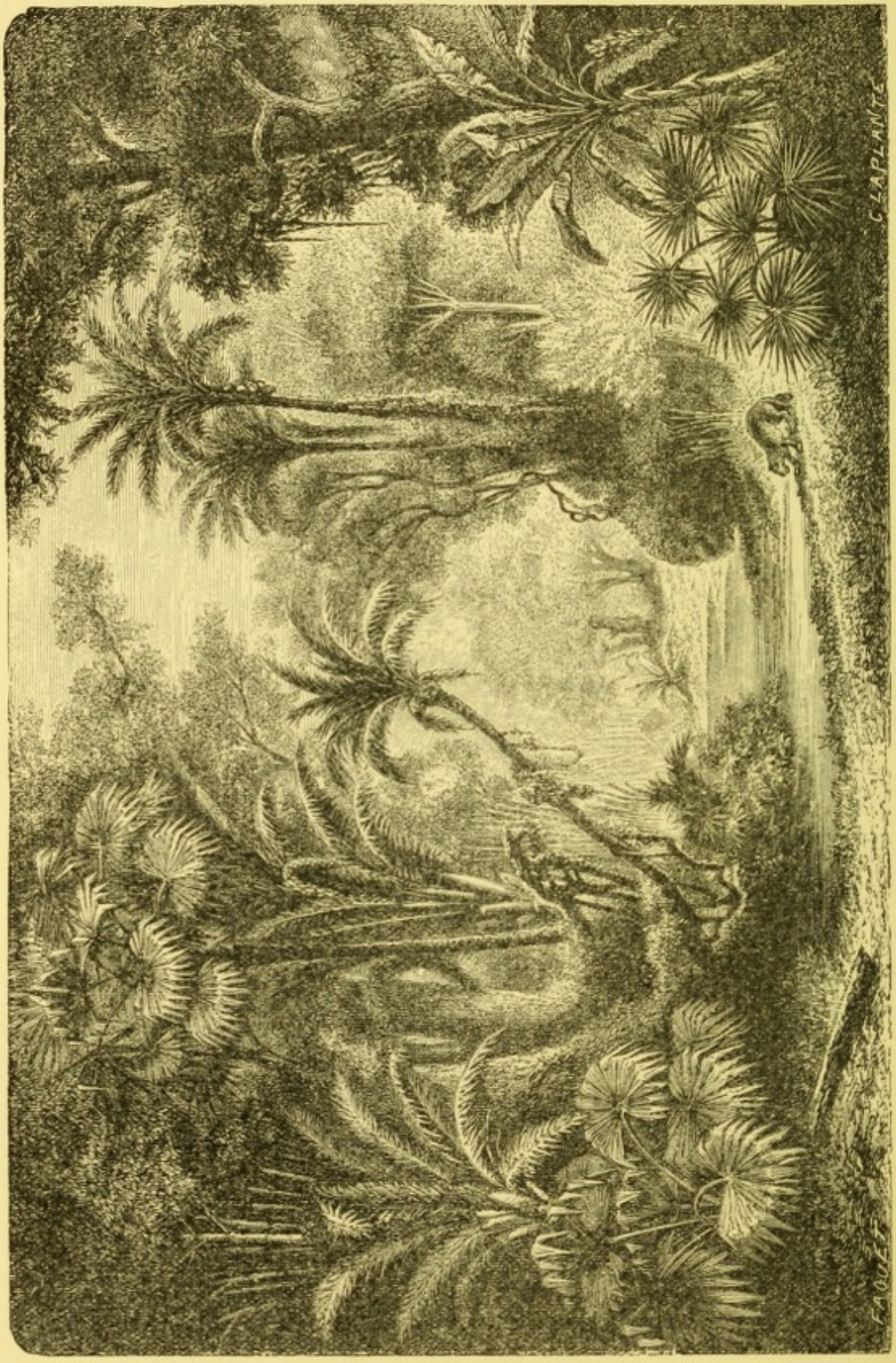
The animals it has been remarked, combine those of temperate and tropical regions. Thus there is a bear, *Ursus Syriacus*, allied to that of Northern Europe, hyænas and jackals of temperate regions, and the *Hyrax Syriacus* or coney, which belongs to a genus of animals, not found in temperate climates.

The ornithology connects Asia, Africa and Europe; and the birds by their migrations, to these varied countries are significant of THE MISSION to all parts, of the race which was planted in Palestine.

Numerous tribes inhabit Arabia, more or less pure descendants of Shem. In another work we shall endeavour to trace the connexion between the tribes at present inhabiting Arabia, with various heads of families mentioned in Genesis. But in our rough and superficial view of the subject at present, we must consider the whole as Arabs, whether descended from Cush, Keturah or Ishmael. The description given of the various tribes of Arabs differs considerably. They vary in complexion; the brown darkened greatly by sunburning is the most common; but black and yellow likewise are found. They are a wiry, muscular, spare people, with high noses; and are full of fire and life, especially those who inhabit the desert. Their physical frames are particularly well proportioned; hence the great age to which men of some of the tribes, are said to arrive. Arabia is one of the driest regions on earth, and only a small portion of it is fertile. The high table land of the interior doubtless assists in promoting longevity. The race of Arabs is a superior one morally, intellectually and physically as contrasted with the nations who inhabit many regions of the Earth. The deficiency of rivers in Arabia greatly hinders the cultivation of the soil, which is rendered impossible in many parts. This is a great bar to the civilization of Arabia and to the settling of the inhabitants in industrial pursuits. Their civilization like the fertility of their soil, is confined to narrow limits, and does not progress like that of European nations.

The Caucasus is inhabited by a race, whom it is the fashion to consider the type of the so-called "Caucasian race." They vary considerably in physical appearance, some having regular features resembling handsome Europeans; while others, although with a comparatively straight facial angle, have eyes which approach the Mongolic type. The beauty of the race is doubtless much exaggerated, unless when viewed in contrast with Negroes or Mongoles. Most of the tribes inhabiting this region are more or less warlike, and long withstood the power of Russia. They possess great courage and some intelligence. Had they been the superior race they are commonly thought to be, they would not have remained so long barbarous. The same observation may be made with regard to Circassians, as of most other mountain people;—they are split up into small clans, and fight gallantly for their independence.

India is the richest in natural resources of any country of Asia, and might well be independent of all, for necessaries and luxuries. The precious metals are not so abundantly found in India as in some countries less rich in organic life. Hence the



A JUNGLE IN INDIA.

tendency of them to gravitate towards the peninsula of Hindostan ; while the lighter spices and manufactures of Hindostan, rush back to fill the vacuum. India is protected on the North by chains of mountains, and on the west by deserts ; while on the East the comparatively inert and unenterprising Indo-Chinese races act as a sand bag, to break the force of any great incursions from the East, of hardier or more warlike Nations.

For ages India has not governed itself. Nations coveting her rich resources, have crossed rivers, deserts and seas, her natural outworks, to scent her sweet breezes and trample on her inhabitants. The nations in Hindostan vary greatly in complexion, as in manners and habits. Black, yellow and white races occur, answering to Mongolians, Ethiopians and Semitic-Europeans, although most, if not all of the nations inhabiting Hindostan, are usually arranged with the Caucasian, which we term the Semitic-European race. The so called aboriginal inhabitants of India, Bhils, Khonds and Santals, occupy the lowest positions in the country. They are of short stature, and inhabit the low hills. Feeding on reptiles and refuse, they contrast greatly with the Brahmins and higher castes, the precepts of whose religion enjoin great scrupulosity in the selection of food ; which is even made a standard of caste. The caste system is one of the most extraordinary ever imposed by Man on himself, and greatly distinguishes India from other lands. It had its origin partly in Sectarian, and partly in Racial distinction. As a general rule, the fairer a race is, the higher the caste. This is particularly the case in the extreme high and low castes ; the Brahmins being mostly yellow or brown, and the Pariahs black. There are exceptions to this, in black Brahmins and white Pariahs. Descendants of Arabs from Arabia and Africa, exist in central India and Concan. The various tribes of India are perhaps in harmony with, its physical character : high mountains and low valleys. The inhabitants have complicated and simple religious systems. The position of India as a peninsula in Asia, is eminently calculated for maritime commerce ; and its inhabitants, next perhaps to the Arabs and Malays are the most inclined to the sea, but little is done in maritime enterprise, compared to what might be, by a nation whose highest castes were not like those of Hindostan, restricted from sea voyages.

CHAPTER III.

A NEW LANGUAGE OF PLANTS.

PLANTS—THREE EMPIRES IN NATURE—THE LOWEST PLANTS—MUSHROOMS—FERNS—RUSHES—CEREALS—THE REED AND THE OAK—BULRUSH—ORCHIDS—CEDARS—WELLINGTONIA GIGANTEA—THE YEW—ELM—WILLOWS—OAKS—HEMP—NIGHTSHADES—ROSE—THISTLE AND SHAMROCK—CHAMOMILE—TEASEL—HONEYSUCKLE—PUMPKIN.

PLANTS are Organisms, but not Animals; and occupy a division in Nature so large, that it has been commonly termed a Kingdom. We believe in *Tri-unity* as an ordinance throughout the Universe. It begins with The TRINITY, and extends lower down to the kingdoms in Nature. The World is a unity, but it has commonly been divided into Three, called, "the mineral, vegetable and animal kingdoms;" which may be reduced to Two. These we are inclined to term the INORGANIC and ORGANIC Empires in Nature. To these Empires we would add another, rendered necessary to give the true position to Moral Beings, who are raised as far above mere organisms as Organisms are raised above Inorganic compounds. The intelligent administrators of law are surely entitled to a separate division, one of a Trinity, to which we give the term MORAL EMPIRE. These three great empires,—the inorganic,—the organic,—and the moral, are the analogues of the body, the soul and the spirit.

But the first and last divisions into which we divide Nature, are admitted compounds of many elements; and the organic divides itself at once into two sections, that of Vegetables, and that of Animals. The division between the higher plants, and the higher animals is distinctly marked. But the lower subdivisions of each, show a considerable resemblance in their mode of life and propagation. The lowest plants, and the lowest animals, long held a disputed position changing from one kingdom to the other, as ages in scientific discovery rolled on.

The less highly organized or flowerless plants, (Acrogens) which multiply by spores, have no analogy with those animals with a backbone, but the trees, the wood of which possesses concentric rings with pith in the centre, are a true analogue of

the vertebrata. To carry the analogy still farther, the grasses, the palms, and the whole of the rest of the Endogens, typify the higher Invertebrate animals. Plants as a great class typify the animal or corporeal life of man, while the animals illustrate his instincts and passions, exercised in connexion with his body.

The Diatomaceæ, appear to stand lowest amongst plants in the organic kingdom. Their skeletons consist of pure silica, which must be separated from the fluid in which they float, by a most extraordinary process. The lower forms of vegetable life contain more silica than the higher. Thus the horse tails or Equisetaceæ are rich in this substance. Amongst the Endogens the grasses occupy an inferior place, and also contain much of this stony earth. These diatoms have been called brittleworts from their frangibility. Their hard stony skeletons pass unaltered through strong acids, and through furnaces heated to the utmost, without losing their minute markings, which almost defy steel engravings to depict, when made visible by the most powerful microscopes. Carried in the form of fine dust out to sea, they fall in showers on ships. The microscope magnifying these a million fold, displays them in the form of silk winders, spindles, globular bodies studded over with little globes, small-toothed combs, trellis works suitable for the floors of boats, peg tops, Polynesian paddles and shields. The Naviculæ among these atoms, derive their name from their resemblance to little ships. This minute dust so full of life or the remains of life, this scum on the waters, exceeds any amount of which the human mind can conceive. The entire dust of the earth as it appears to the naked eye, would not if enumerated, afford a larger array of figures, than would represent the individuals of these minute atoms. Large figures fail however to convey to the minds of most persons, a due sense of vastness.

These diatoms have long held a disputed place between plants and animals; and are probably the type of the connecting link, between the animal and the Immortal LIFE.

The yeast plant (*Fermentum cervisia*) is one of the simplest of organisms. It consists of a single cell, divided into two parts, the walls of which are composed of cellulose matter, full of an oily substance. It was long doubted whether this was a plant or not; but through that revealer of secrets the microscope, it has been made clear that it is a living organism. When freshly added to the brewer's wort, if the temperature be suitable, germination commences and little buds appear, which in the course of three hours take the form of double ovals, and in eight hours they form marked chains resembling bird's eggs,

as strung together by boys. Some explode, apparently with the effort of birth, and cast about minute dust, which is probably often present in the air, and thus accounts for the fermentations, that appear to take place spontaneously in liquors. In a still later stage these round bodies form branches at divers angles; while in the former they were nearly in a straight line. These plants are among the simplest, yet yield to none in marvellous transformations.

They are a type of those influences ever at work, and ever ready to take advantage of circumstances calculated to increase their power. It is to be feared that there are in every great town, persons who only wait their opportunity, to do the greatest amount of injury to society, and had they the power would not scruple to ruin their nation.

We shall in the chymical view of the human mind refer to the analogy between the different changes and sorts of fermentation and Mental and Moral transmutation. Diseases of the Fungus class, are amongst the most destructive to the plants on which we depend for food. The potato blight, *Botrytis infestans* which likewise attacks its kindred plant the tomata, renders the crops of these two valuable vegetables in some cases total failures. The fairest fruits of agricultural industry, like the precious seeds of a good moral education promise well, the character speaking for itself; for good morals ennoble and elevate. But these growing plants must have a good soil, receive many rays of light from above, and drink in abundance the dews of Heaven. Disease may then appear, but cannot mar the crop. But with a cold damp soil no blessing accrues when the sun shines but feebly on the crop. These fungoid spores, floating in the air like Satanic messengers, plant themselves in situations ready prepared, and are thus the means of destroying or marring and corrupting, what might otherwise be most useful, as long as existent on earth. But this disease not merely corrupts the present generation of crops, it infects the *seed;* an analogy which may be carried far into the nature of man: for children may be corrupted as well as their parents.

These Fungi take various forms, not merely infesting plants, but birds, insects, fishes and even man. Vegetable parasites are more noxious than the hydra amongst animals; and are said by some writers, to be the cause of cholera, to infest the foul air from sewers, and carry malignant death. Minute though they be and unseen by the ordinary observer, yet they play their parts, and do their evil works, like spirits from the infernal regions. The unenlightened ignore them; but the Microscopist, like "the wise who understand," sees, dreads, and makes his dread known.

The great Fungi of our meadows, heaths and marshes, attain to tree-like proportions when compared with the low plants that infest our bodies or our liquors. Those in Britain alone, are a very numerous class, and grow with greater rapidity than any other division. They rise above the soil in an incredibly short space of time. Those men who in a very little time, rise to importance in the world from a low position in life, have been long compared with mushrooms. To most eyes mushrooms are only of two or three kinds; the good mushrooms (*Agaricus campestris*) and the toadstools; poisonous and indicative in common parlance of an "unhealthy soil." These toadstools are worthless, and are cast away as loathsome rubbish: and are suitable types of those who by foul means rise to wealth and power. The good mushrooms illustrate those who by the development of talent and industry, rise to a position at the best tables.

But we must go farther into detail as popular prejudices are not always in accordance with scientific facts. The number of species of this order in Britain is immense, and there are even more in America. They almost equal the flowering plants of Great Britain in number of species. The flowering plants are a type of those buds and "blossoms" of humanity—the landed gentry, who do not usually spring from the same source as the "mushrooms." When the mushrooms are grown they are admired if they are well flavoured and innocuous, but even when defective in these respects they are interesting objects of study as part of the vast variety of life. In most cases we know little about their remote origin.

Some mushrooms scent the air with the perfume of cinnamon, of apricots, of castor oil, of tallow or of hawthorn; sufficiently emblematic of classes of persons and of the way they have risen. The scent of some mushrooms cannot be borne within doors, while others phosphoresce like brilliant insects; the type of genius: true Genius which is not confined to persons of high birth or refined education. Mushrooms are too much despised by persons in general. They are parasitic on one another. Human "mushrooms" despise each other, and make grimaces at a low origin. Among higher mammalia, when two curs meet, they evidently look down on each other, when they are too well bred to quarrel.

> "Cloth of *frieze*, be not too bold,
> Though thou art matched with cloth of Gold,
> Cloth of *gold*, do not despise,
> Though thou art matched with cloth of Frieze."

This motto of Charles Brandon Duke of Suffolk most suitably surrounds his portrait in our House of Lords. And well

does it illustrate the union of the aristocratic and commercial elements in our country; mutually supporting and strengthening each other.

Commerce and manufactures, if they sometimes produce mushrooms in society, rid the country of much corruption and render it more suitable for an advancing civilization. There are many wholesome mushrooms which "authority scowls on, and taste is disgusted with, and fashion is ashamed of" merely because they have never been looked at or their good qualities examined. They are the types of embryo heroes, such as Gray supposed might have been buried in a country churchyard. And we are much obliged to Dr. Badham for "digging the dust enclosed here;" that is to say in the mushroom class, and rescuing from vulgar contempt the choice esculents of an order, unjustly and ignorantly despised. For it is not generally known that a large number of our Fungi are delicious food, rivalling in flavour the choicest viands derived from the animal kingdom. Beefsteaks grow on oaks in the shape of *Fistulina hepatica*, and oysters for sauce, called amongst the mushrooms Hydna. *Agaricus deliciosus* has been compared with lamb's kidneys, and the yellow chanterelle, which has been called the "*Kalon Kagothon*," is as abundant as the vilest toadstools. There is the sweet *Boletus*, the choice *Orcella* and the *Agaricus heterophyllus* which has the flavour of cooked cray fish. The colour of many species is most brilliant. Every shade of the peacock's tail is found in some, in others lovely mauve, Scheele's green, the brightest orange, scarlet or buff, as well as the finest ivory in polish and tint. The lustre of bright metals also,—gold, silver and bronze, decorate this class, which is much less beautiful in form than other plants. Many remind us in shape of an umbrella. Mary Howitt saw a mouse under the shade of a mushroom, feeding in a wood, which she describes in her poem to the wood mouse. All these uses, these resemblances in taste and flavour to objects in artificial life, convey important lessons, as well as enlargement to our minds.

Mushrooms are mostly types of low life. Their form is clumsy, and like the low and less delicate in a population, though sometimes showy in their style of dress, are vulgar in their contour. Our ordinary edible mushroom has a fine flavour, especially when gathered on a high moor. And in the form of that most delicious sauce ketchup is an every day article at our tables. It is cultivated in our cellars, but these have not the delicacy of the field mushroom; significant of the superiority of country bumpkins to the refuse population of towns.

The truffle (*Tuber cibarium*) is subterranean in its mode of growth; sows and dogs, being trained to scrape at the spot in

those beech woods where it is usually found. A fine truffle scents the air with a perfume more stimulative of the appetite of the body than of the soul. It can only be got with the aid of the instincts of the lower animals. Although man is intended to enjoy the fruits of the earth, yet the excessive indulgence of the appetite, which demands such great exertion of low instincts, reminds us of that school of Mohammedan heretics who located the soul in the region of the abdomen.

The bead mould which infects decaying animal and vegetable substances, is of this fungus class, and gathers when a suitable place is found for its growth, without any planting apparent to ordinary eyes. Over bread, and wherever moisture and decay combine, these plants spread with marvellous rapidity; as do the mildew (*Puccina graminis*) and the smut in wheat. Those that attack living substances, feed on their vitals, and bring them down to physical death, are emblems of those sins which "eat as doth a canker," and unless cured, reduce the body as well as the spirit to the lowest ebb. While those that feed on dead substances are like the machinations of evil spirits, which hurt property when they have destroyed life.

This class of plants, spreads at a rate far exceeding what we have examples of, in any other department of creation. Thus the red snow plant, (*Protococcus nivalis*) changes the spotless white snow of some northern countries, to brick red dust in a single night. The lovely and innocent flowers whether in the mineral, vegetable, animal or moral world, can be changed to the deepest dye of guilt by the stains of earth. The purer they originally were, the more easily are their stains seens; corruption being *complete* alike in the simplest substances as in the most complex. The more complex enter with greater facility into new combinations, their decomposition is not so final. When two bodies are combined they are more liable to be stained, but at the same time they can be purified to their original whiteness again; which is less easy with highly complex substances.

Lichens are beautiful objects in their native places, on the tiles of a country cottage, where the house leek and the stone crops blow. The red tile often contrasts beautifully with the green and yellow lichen (*Parmelia*) growing on it; to be faithfully copied in all its pure tints by the Pre-Raphaelite painter. In our orchards we see the apple and pear trees covered with rich coloured plants of this class, which are stolen by the gay goldfinch or chaffinch to decorate nests formed of beautiful moss, which are thus made *en suite* with the tree.

This is the beautiful view of these lichens; but they feed caterpillars and larvæ, they grow where little else will grow,

and form soils on inorganic substances suitable for higher plants. These lichens like other parasites, cannot live where health and purity exist, whether among animals, vegetables or minerals. But disease and death are necessary to progress as things are now constituted. The lichens do not grow in the earth, having leaves and stems in one. They have a strong resemblance to cancers (*Morbus Brightii*), if they are not to be classed together. They vary much in shape and colour. Some are bright and beautiful in hue; and we think how lovely they are, how rich their markings; but yet their shape is grotesque, and suggestive of life in death. They are as injurious to the higher vegetable world, as the lower fungi are to the animal; producing sores on their substance. Healthy young trees are not nearly so subject to their attacks as the old and diseased. The trees in this case are types of man. Some fungi are bright in aspect, being adorned with orange, green, vermilion and scarlet hues, which are not found so purely in most divisions of the vegetable kingdom. These are more easily imitated by the use of mineral colours, many of which are virulent poisons; such as Scheele's green, orpiment (sulphuret of arsenic), chrome yellow (chromate of lead) and the scarlet periodide of mercury. These colours differ from the general tints of vegetation, being hardly ever seen covering an entire plant except among the fungi. The hues of these lichens, which resemble those of our most corrosive colours, illustrate their injurious effect on the plants they infest.

The liverworts (*Marchantiaceæ*) as possessing stalks for their reproductive organs are a more advanced order than the lichens. They are not like them poisonous parasites on living plants. Wherever neglect or solitary gloom exists, there they increase and cover the ground; perhaps choking other plants, but growing where little else will grow; and when they die, they leave a soil behind them enriched, and suited for those lovely flowers that blossom best in the shade.

The scale mosses (*Jungermanniaceæ*), the hair mosses, the screw mosses and the urn mossés (*Bryaceæ*), are all suggestive of objects in common life. They grow diversely in the driest, as well as in the most marshy situations, according to order and species, and are beautiful in form and structure. They multiply by spores; but the scale moss bears considerable resemblance, to such plants as the pearl wort and chick weed. Many of the mosses cover walls where no other plant seems inclined to grow, until the moss first sets the example, giving to the barren stone the verdure of life. Illustrating how to the young fertile mind, no situation can be unproductive of fruit; or is incapable of being developed into a soil, where the bright and lofty can flourish.

The Confervæ form a very humble class of plants, connecting the Plant-animals with the *Algæ*, and are met with at a suitable temperature wherever water stagnates. They resemble little tubes jointed; and are as fine as thread, multiplying by grains or spores, contained between the joints. The spores of these plants and of those still lower in the Organic Kingdom, require the same combination of circumstances for their perpetuation. The original seed must be sown, often unseen by man, who does not always look with a microscopist's eye, on the hidden birth of those germs which people earth, air, and water. These last are all required, to wake them up to active strides on the ladder of progress.

The Algæ are entirely submerged below the surface of the water, whether fluviatile or marine. They propagate in two ways, either by external spores, or from a piece of the interior like one of Adam's ribs. They are very various in form and colorization and illustrate many varieties of terrestrial vegetation.

Sub-marine scenery has an analogy to that on dry land; but not so close with the dry land of our present earth, as with that of past days, when the Cryptogamia were the principal vegetation of the age. This leads us to consider the types of Ages, backwards when we look at the progress that has been made, and forwards, if we are to take scripture literally, to the period when there shall be "no more sea." Then our present recent seaweeds will only be known as fossils, the historic records of a past age.

The seaweeds also illustrate our manufactures, some being like whipcord, others like leather, and nearly as tough. The stalks of some, form no contemptible substitute for stag's horn. Some resemble elaborate crochet or needle work, while the delicate fronds of a vast number of species, suggest patterns for a great variety of ornamental or decorative work. The Algæ are extensively used as food, on those barren islands of the ocean, that produce few higher vegetables suitable for supplying the wants of man. The Carrageen moss and laver are admitted at the best tables, in the most civilized parts of England; but only on rare occasions. A country must be degraded indeed, when its inhabitants like those of Patagonia and New Zealand, depend principally for food on the Cryptogamia. The colours vary; almost every shade being represented in the waters, the predominating hues are brown and green, like the tints that prevail on land, amongst the plants of earth. The Cryptogamia as a class, contain the greatest amount of earthy matter of any plants.

The Algæ, the most earthy of vegetables, are representative of the bony structure of man, his skeleton, the foundation

of his individual kingdom, the scaffolding on which his muscles and flesh are built. The early stage of man is not in bone, but in pulp, like the beginning of these organisms; his structure has however closer analogies with the more advanced members of this vast vegetable kingdom.

The Charas shew a likeness to the glass worts (*Salicornia*) among the simplest flowering plants; being greatly in advance of the lowest Cryptogamia. They were for a long time classed with the flowering plants.

The earth was clothed with flowers that it might be fit for the habitation of man. Green is the emblem of youth while flowers represent dawning maturity, the type of that age which precedes the time of fruit; the age of greatest importance, but the forerunner of decrepitude and death. These flowers are glorious emblems; they fade, but every spring adds to their beauty, or to that of still more lovely flowers. These Charas are the connecting link between higher and lower classes. They are not in themselves the highest members of their class, having perhaps qualities, which in their own sphere give them but a modest and inferior place. The highest members of a *low* class, be it remembered, are not those that we ought to value most, being themselves often a low class in a high position. "Beggars on horseback" are not the objects we like best to look at.

Most of the ferns and flowerless plants require little sun and much moisture to flourish and ripen seed. The higher the type of plants the more light generally is required which illustrates man's case morally. The more elevated the status of nations or individuals the more they are capable of being illuminated.

The ferns were formerly extolled as medicaments, now they are little valued and even the use of these simples is thought by many to be a relic of a barbarous Age. But the aid of every medicine, is lawful if used in its right place. Therefore the truly enlightened physician, makes use of the lowliest plant, as well as the most deeply buried mineral.

In Ireland, Wales and the least civilized parts of our country, the ferns and Cryptogamia, grow most luxuriantly. We admire their wild beauty and transplant it to the centre of culture. Art should copy Nature, in the lowest as in the highest forms of life; Art should use and diffuse all things, but give the highest its just place.

The Irish fern (*Trichomanes speciosum*) exceeds most of the tribe in beauty, as well as in delicacy. The ferns have well been compared with the fair sex, after whom several species have been named. The Irish fern from its dark colour and

love of a moist climate, may be a type of the Erse beauty. While the lady fern (*Athyrium filix-fœmina*) a more generally distributed plant, is a type of the Saxon girl, who possesses a different character of beauty. The Irish fern and the Irish girl, live in a damp and cloudy climate, while the lady fern and the Saxon, inhabit generally, comparatively dry localities.

The true maiden hair (*Adiantum*) of which a great variety of species clothe the mountain rocks and caves of many parts of the world, is represented in Britain by a little species confined to a few localities in Devonshire, Wales, Scotland and Ireland. It is the most refined looking of all our ferns, and its black stems have been named from their resemblance to the hair of a maiden. It singularly enough grows in Devonshire and Wales, localities where black hair is most abundant.

The passage is abrupt from "maiden hair" to horse hair (*Equisetaceæ*) or horse tails, but the class is an advance on the graceful ferns, the fruit being of a far higher order; reminding us of that of some conifers, which they also resemble in their foliage; while their jointed stems convey to us a faint idea of palms and grasses. The age of this tribe is past. It was that of the Lepidodendrons, of the coal measures, the Kings or the Queens of the order. The horse tails and tree ferns are all the arborescent ferns that are left to us. The horse tails resemble the brushes of the modern chimney sweep; alike attached to a jointed stalk.

The little duck weeds (*Lemna*, N. O. *Pistiaceæ*) that float on our stagnant ditches, are the simplest forms of our flowering plants. The stalk and leaf are united, and the flowers are in a slit at the edge. The root is a simple, straight, white thread. They have been classed with the Cryptogamia, as their organization is so much lower than that of the higher flowering plants. These little duck weeds, illustrate the infancy of an individual, of an upper class in society. They are higher in status than the highest members of lower classes, but are *inferior* to the higher members of lower classes in capacity and power. They however commence an upper class.

Rushes are seldom found except in marshy places; they are troublesome to the agriculturist who may try to extirpate them by weeding or rooting up; but unless he remove the cause of their growth, the moisture that makes the soil rank and fit for such weeds, he spends his labour in vain. The source of stagnation must be dug into, that the water that lies low may be allowed to fall lower, and run away into the depths of the earth. In the moral world a similar change of circumstances is required. The dew of Heaven, and the sun from Heaven call into activity germs of life both good and

evil. Rushes are not in themselves types of anything that is positively evil in their own place; but in the wrong place there are few plants more hurtful. Low social life transplanted to higher is revolting. The "handmaid that was heir unto" or usurped authority over her mistress was in this odious position.

In earlier times, rushes were the chief candlewicks known, to our rural population; the chief aid in assisting the consumption of tallow, and of enlightening cottages when gas was unknown. They are still used in villages, behind the progress of the age. Their light was feeble, flickering and uncertain, but cheering to the gloomy hovel, lit only by the glowing ember. Such illustrates the state of the rural districts in the middle ages, viewed through *the moralist's spectacles.* The bonfires at Smithfield, "acts of faith," diffused a glow through the entire moral circulation which while it roasted and scorched, chased the cold currents of ignorance and superstition into a corner. We have many successions of lights of greater or less volume and intensity. The glowing embers of primeval light which once blazed brilliantly, were succeeded by a clearer though less powerful "light."

The use of oil, gas, stearine candles, and paraffin for light, are all emblems of progress in knowledge, theological, scientific and universal. But two lights are alone really pure; the one is the "Electric," a direct descent from above. It is known by its purity and colourless character;—the human eye can hardly look at it. The other is the lime light which has a similar dazzling appearance. It is a result of the combination of the pure elements oxygen and hydrogen, in connexion with the earthy lime: a type of a glory truly celestial, taking possession of, and being reflected from the Earth.

The grasses (*Graminaceæ*) are the most important of plants; and the cereals stand first, with wheat at their head. The nations that feed on wheat, (the most perfect food for man) are usually the most highly endowed. In Scripture it is considered as the type of spiritual food "the Bread of Heaven," being compared to "the finest of the wheat." This should be the staff of man's life, but it is advantageous for him, to avail himself of every other substance suitable for his food. The man who would confine himself exclusively to wheat, would be in the same position as regards his physical development, as the moralist, who cultivated too exclusively, a department of theology.

Barley (*Hordeum distichum*), rye (*Secale cereale*) and oats (*Avena sativa*) can be cultivated where wheat will not grow. They also are emblematic of the "Bread of Heaven," as the main food of man in all civilized countries.

Christian missionaries, have taken to the most distant Polynesian islands, "the fruits of Ceres." Thus the savages receive simultaneously, temporal and spiritual blessings. Nearly all these cereals grew in Palestine; the centre from whence also the truth shone, which has been the means of enlightening the world.

Rice (*Oryza sativa*) is the next important of the grasses. In most Eastern countries it is more used than wheat, and may be said to feed half the globe. Rice is not so good a food as wheat, nor so well adapted for the entire support of man. The kernel consists almost entirely of starch, a necessary of life; and that derived from rice, is as suitable for human food as from any other source.

Rice illustrates truth received by the natives of many tropical countries, who but imperfectly take it in and are not nourished by it into such vigorous specimens of humanity as those feeding more generally on wheat. Wheat will grow in most of these countries; and therefore purer, and more perfected food is to be had, for those who will cultivate it. The fruits of all countries have their special merits, but it is in using all, and in abusing none, that our power and influence, as civilized beings depends.

Grasses are seldom poisonous, but the bearded darnel

THE CULTIVATED OAT.

(*Lolium temulentum*) equals in virulence the treacherous families of the hemlock and the nightshade, for its seeds having been ground accidentally with barley have caused death. It is an ally of the rye grass (*L. perenne*), a useful species in our own pastures, showing how what is harmless, approximates to what is noxious. The darnel grows treacherously in the midst of other grasses. It is "the tare" of Scripture which grew among the wheat—like Judas among the Apostles, standing alone, one poisonous weed in the midst of a pure and healthy family.

Reeds bend before every blast, from being very light and thin; yet as their flexibility is distributed throughout their whole length, they do not easily break.

A reed may be compared with a tall graceful girl with a head of pretty hair waving in the breeze, like the flower of this plant. She bends to the touch, and yields herself to the hand that grasps her. The fable is true, the reed can stand the blast, better than the oak. The slender girl often resists the storms of life, better than the stalwart man. She shrinks before every breath of trouble, and tears like abundant dew fall, which appear to refresh rather than exhaust her, for she pours out all her grief in them. We may picture her husband like the rigid oak, long defying the little winds, the mere belchings of the storm of trouble. Like raving Lear he cried, "Blow wind and crack your cheeks."

The commercial tempest first drew from him a laugh, like the wind rattling in the leaves of the oak. As the storm increases, the top branches of the oak begin to wave; but his leaves only rustle the louder, rising into a shriek with the hurricane. At last a crash is heard, a giant brother of the forest has fallen, long as steady as himself. Then another crash and one more great tree falls prostrate to the earth, and in its downward course sweeps some of his own small twigs. And now he stands alone; the trees that kept off the wind from him are gone, and the tempest rages without check upon his head; the four winds vowing vengeance on this stout one, this stiff necked one, pour all their force upon his crown, and split him to his root. His fall almost appals the earth. And now his case is hopeless, his life is passed. Our commercial friend, who does not yield to the storm; who is too proud to bend, must fall. The reed survives the storm, but if dry chilling winds last she withers and dies; but lives long enough to continue her race.

The *Papyrus antiquorum* famous from remote antiquity, has handed down even to our own day, writings and memorials two or three thousand years old. It is more durable than any artificial paper, and was used in strips 14 feet long by 1½ feet broad, and upwards. It grew in Egypt, from which it has been

nearly, if not quite extirpated; significant of the decay of the civilization of ancient days, and of the crumbling monuments, which retain little of the halo that once surrounded such stupendous productions of art. The leaves of many palm trees, are used even in the present day to record passing events, and to hand down great deeds to posterity. The labour of writing on these plants, and on the skins of animals was very great; but the literary monuments of these past ages are perhaps more enduring, than those of our own. In ancient times there were fewer competitors for fame, and therefore more chance of "achieving immortality." Will our writers ever take the place of those of antiquity? "Immortal heirs of universal praise."

The cotton grass (*Eriophorum angustifolium*, N. O. *Cyperaceæ*) is our representative of the cotton of the tropics (*Gossypium vitifolium*). An attempt has been made to turn this little plant of our bogs into calico, but without success. Some ingenious speculators, wishing to see us entirely dependent on our own resources, proposed among other things, that we should grow our own cotton, the "king cotton" that is so much adored; and so the wiseacres searched the bogs. Their ears being stuffed with this cotton they would hear no rational objection to it, until the bubble exploded like gun cotton.

The flowers of the arum are sheathed with a beautiful spathe, that protects a pistil, which from its brittleness and unwieldiness would be easily destroyed before the impregnation by the stamens. The leaves are curled up and gradually unfold in all their beautiful, delicate new, green life. The rustic name "lords and ladies" given to our native species is suggestive of the spathe round the flower, being a type of those *artificial*, as they have been termed, but in reality natural distinctions and protections, that surround the lords and ladies in society.

The bulrush (*Typha latifolia*, N. O. *Typhaceæ*) so abundant in our marshes, reminds us of two common objects: the torch that lights up rustic festivals, and the sponge that cleans the torch of war—the great guns; which alike exist amongst smoke and flame. How different is the life of the quiet bulrush as it waves in its native marsh, until the passer-by stretches out to seize it. In like manner the recruiting sergeant, leads off one of our tall country youths, away from his dull village life to fill the craw of the goddess of discord, whose fatal coveted apple, has conveyed the poison of disorder, into the very blood of man. War is a poison, but the most efficacious medicines are the greatest poisons; proving that nothing is injurious, except in abuse.

The roots of colchicum (*C. autumnale*) and white hellebore (*Veratrum album*) are among our most active agents on the

human body. The flowers are pretty, but the whole plants are acrid, and do not like the nightshade tribe, by a sweet taste, invite the palate. These plants are types of the sworn enemies of men, who do not attempt to conceal their hatred, but by the bitterness shown in the mouth, and by the irritation shown in the throat, evince that they are animated by a deadly venom, such as that of the alkaloids veratrine and colchicine contained in these plants.

The hyacinth (*H. nutans*) is a graceful flower, not of the highest type, but still beautiful. Our own little hyacinth, is small compared with the oriental species. We consider the hyacinth a type of the tall, graceful, elegant woman with magnificent hair, falling in a truly "hyacinthine" manner on her slender neck. She has but little expression, and not that exquisite complexion, which appears to have caught the "hues of the lily and the rose." In early youth alone she is sweet, when in the least faded her power of attraction is lost. This style of beauty attains its greatest perfection under an oriental sun, Georgia and Persia, being the land of these oriental hyacinths, as well as where "hyacinthine locks" attain a great development.

The lilies are of many kinds both white (*Lilium candidum*), orange (*L. bulbiferum*) and yellow, variously spotted and marked. They are particularly abundant in Palestine, Asia Minor, and Persia, from whence they have been brought, and are cultivated in our gardens. The white lily may be taken to represent the family. It is a stately plant, whose fine green leaves, contrast well with its waxy blossoms, and bright yellow stamens : it diffuses around an agreeable fragrance. The lily's form is very graceful. Amongst common flowers it is supposed to stand next to the rose in beauty. These were united as an emblem of our Lord. But the lily of the Song of Solomon is probably the Polyanthus Narcissus, while the lily of the valley of Scripture is *L. chalcedonicum*. Cowper in one of his poems compares these flowers to the cheeks of our fairest daughters.

The tulip is a sweet scented flower. When wild it is single and pale yellow ; but when cultivated, it assumes almost every colour, and acquires variegated markings, but mostly in the form of longitudinal stripes. The tulip, the hyacinth, and many other plants are immensely enlarged, variegated and altered by cultivation, which the Teutons especially understand. They do not so much desire variety in species, as perfection in individual kinds. They amplify them to the utmost and endeavour to produce the greatest number of minute modifications to be called by the longest and most fantastical names. This is thoroughly characteristic of the Teutonic mind, which delights

in these numerous varieties of the same thing. The happy medium or Celtic-Teutonic mind, while it desires the greatest development of varieties, is equally anxious to secure the largest number of species, genera, orders and classes. This is true wisdom in the acquisition of intellectual, and material wealth.

The snowdrop (*Galanthus nivalis*, N. O. *Amaryllidaceæ*) resembles the snow on which it reposes. The flower beautifully washed with green, which contrasted with its white calyx conveys to our minds hope, of brighter days, even in the coldest season.

The narcissus (*N. poeticus*) of the poets has been celebrated from heroic ages. It has a single flower, which modern civilization has altered to a *polyanthus*, or many flowered variety. A type of the Artificial character of the present age, in which natural productions are forced beyond their ordinary limits, and multiplied many times their original size.

The crocus (*N.O. Iridaceæ*) salutes the spring soon after the snowdrop—and the wreathed incense of its delicate perfume rises as the flowers open, on a fresh dewy morning. There are many species, some of a rich yellow, others fine purple, pure white, or beautifully variegated. The Crocus of Ovid was changed into a flower on account of his impatience in love, and the flower was called after him. Spring flowers are short lived. The heat developed in their bulbs forces them early to court the spring ; but like premature love, the blossom is soon blasted, withers and dies.

The orchids (*Orchidaceæ*) are so various and magnificent a tribe, that a whole chapter might be written on them alone. Of all flowers they are the most varied in their illustration of other objects. Thus we have in Britain the bee (*Ophrys apifera*), the fly (*O. muscifera*), the butterfly (*Platanthera chlorantha*), the spider (*O. aranicifera*), the bird's nest (*Listera nidus avis*, Hooker) and the frog ; and numerous insects, birds and other objects are illustrated in foreign species. We have the man orchis (*Aceras anthropophora*), the lady's tresses, the lady's slippers (*Cypripedium calceolus*), the fool's orchis (*O. Morio*), and even the globe (orchis), in two hemispheres with its meridians, is shown in the twayblade (*Listera ovata*). These resemblances are sufficiently extensive, and on this ground alone, we would place the orchids at the head of flowering plants, from a typical point of view. But the crown of beauty is still to be bestowed on them. It is a glorious crown, more beautiful, and set with more varied gems, than any other it is in the gift of Flora to bestow. Our little orchids are beautiful, but the tropics alone produce those lovely flowers in their greatest development.

The flowering rush (*Butomus umbellatus*), with its long needle-shaped leaves, and its bunch of delicate pink flowers, with their remarkable cluster of pistils, is a British plant of great beauty and interest. Few plants have we looked for more anxiously, and few have refreshed our eyes more when found; for rushes in general have but a sombre flower, with none of the brilliant beauty it possesses. It is very agreeable to find what is lovely and bright, in the midst of what is dull, heavy and dusky; like *one* pretty lass in an ugly family of sisters.

The cedar is a magnificent tree, with which we commence the great class Exogens, and the order of the Conifers. There are two kinds commonly cultivated; the cedar of Lebanon and the Virginian cedar; both unrivalled in their own districts, among those that bear cones. Forests represent great Nations and great Empires, while the largest and finest individual trees, are supposed to be their representatives or monarchs.

The cedars of Lebanon (*Abies cedrus*) looked down from the heights towards the Mediterranean, and those of Anti-Libanus towards Damascus, emblems of the great kingdoms of Syria and Tyre. The Virginian cedar is a type of the "Old dominion."

The cypress (*Cupressus sempervirens*) is a dark gloomy looking tree, much planted in graveyards. It stands erect, not like those that are bowed by grief, but like those who preserve a gloomy stern and mournful aspect. They never change their appearance of gloom; like the Jews, who maintain their sombre expression of countenance, in prosperity as in adversity.

The larch (*Abies larix*) is a gay, light tree, compared with the cedar or the pine. Its young leaves are of an exquisitely fresh colour, as they appear early in the season; more like the fair Saxon youth in its delicacy, than the darker Celt.

> "Like leaves on trees, the race of man is found,
> Now green in youth, now withering on the ground."

This simile occurred to old Homer, and the analogy between men and trees was acknowledged at even an earlier period; so early as that of the book of Judges (ch. viii.).

The *Wellingtonia gigantea* stands one of the first if not the very first for size, age, and grandeur, amongst the trees of the forest; and in the forests of America that land of great things, and in the most remarkable division of that marvellous land North America, and in the most wonderful district of the dominion of "king Bunkum" California. The great Wellingtonia grows to a vast extent, and being perhaps the largest tree in the world, may typify the future power of the United States. But the timber of this tree, although of so great a bulk, is of little commercial value. A nation's greatness is not

THE WELLINGTONIA GIGANTEA IN ITS NATIVE FOREST.

always in proportion to the size of its territory. The Wellingtonia or as the Yankees call it "Washingtonia," has been called the oldest tree in the world; the age having been computed by the number of concentric rings in the trunk, which are at least Three Thousand. This would carry its youth back to the period of the latter days of the life of Shem, Ham and Japhet; to the cradling of Nineveh; to the time when Babylon was yet in its Baby state; to the period when men's lives were yet like trees; and it is probable that some of the Great Grove, will survive until men live again like trees. It is a wonderful thought that a tree, should be the connecting link, between such opposite points of time.

The slow growing yew (*Taxus baccata*)—the oldest British indigenous tree, lives according to De Candolle, from 1,200 to 2,800 years. The men who live longest, are mostly Long in attaining virility. The yew furnishes wood suitable for bows, and was truly an important tree in the olden time. Its tough wood has a great amount of elasticity like the nation that used it. The "bow" of Joseph "abode in strength," which is highly significant, when considered in connexion with the skill his descendants, displayed in the use of the bow. The old age of the yew is an important type of the great strength of constitution, and of the great age attained by our race.

The willows (*Salix*) are greater favourites with us than the poplars, they are more flexible, and can be turned to a greater variety of useful purposes. Their catkins please us by their soft downy appearance, and faint pleasant smell. The number of willows in Britain is immense as regards species, exceeding every other class of our trees. Willows are mostly low in height, and may be "gathered by any hand," but are yet tough, and difficult to break. There are many sorts of willows. There are "*weeping* willows" on which widows may hang their caps instead of their harps, and there are the willows of which traps are made for the capture of "cock sparrows."

The hazel (*Corylus avellana*), is a plant of much omen, the "divining rod" being a forked branch of this tree. The properties of the tree are very significant; its toughness and endurance, are possessed in common by witches; who stood an enormous amount of pricking without yielding. Its fruit is a type of the results of incantation—"the nuts to crack" for the incredulous.

The oak (*Quercus pedunculata* and *Q. sessiliflora*) our national tree is an emblem of British stoutheartedness and of the British constitution; which like the tree has continued longer than most of its fellows. Trees are emblems of nations. The yew, the oldest of European trees, represents the antiquity of

the Celtic nations of Europe, which is of the date of 2,000 years and upwards,—the very age the yew tree attains. The oak among the Romans was sacred to Jupiter, and being the most famous of the indigenous trees of Europe, let us for a moment consider it, as a type of the Roman Empire.

That sweet voice of the grove, the nightingale, builds its nest at the roots of oak trees, with oak leaves, and its song rises on the suppressed breeze to heaven like the flight of the rapt soul. The purple emperor (*Apatura iris*) rules the insects of the oak, and is Cæsar's emblem; he eats many of the oak leaves, but still the prestige of his name, and the gorgeous lustre of his plumes, cause the greatest admiration for him. The oak gall is occasioned by the puncture of a little hymenopterous insect. It is an excrescence, yet most useful to society. What can be more bitter than gall or than the anger of a Gaul? The irruption of the Gauls on the Roman Oak marred the beauty of the tree, while it added to its utility. Without galls there would be no ink, and no satires "dipped in gall" could be written.

Tannin one of the most important contents of these excrescences, is astringent; the most powerful in general use having a binding influence on the body of man. This the great nation of Gauls exercises in Europe. And why?—because their astringency causes them to be dreaded. It is a matter of fact that the strongest astringents, have sometimes a contrary effect in very large doses. They bind more tightly than the frame can bear; so it gives way with an explosion. The little cynip that occasions these galls, illustrates the development of the Empire of the Franks.

Cradled in obscurity,
When developed to maturity,
Flies forth to colonize.

The oak apple so much sought for in May, to commemorate the residence of Charles the Second in the oak, may illustrate British progress and colonization. Bees place their stores of wax and honey in the hollow oak, whose hard walls preserve them from the spoiler; just as the "wooden walls" of England, throw their strong shields, around her commercial and peaceful industries. The oak has other insect residents. There is the purple hair streak (*Thecla quercus*) amongst the butterflies, which by its hues reminds us of the emperor; and it is an emperor in a small way, being difficult to catch or subdue. If the purple emperor was a type of Cæsar, so this little hair streak is that of the imitators of Cæsar, who resided in the Roman empire. Such were Charlemagne,—Charles V.,—Napoleon I.

The young leaves of the oak are of an exquisite pink brown colour, reminding us of the tint of new-born babes. As the leaves expand, they go through the light virgin tints of youth; deepen into the strong green of *maturity;* the olive of *middle life* and the brown of *decay.* Those plants which shed their leaves; from Homer's days to our time, have been the type of rejuvenescence. The common acorns were the food of the ancient Britons, and those of some species are almost equal to chestnuts in flavour. They are protected by delicate cups, which make them among the most beautiful and finished seeds in nature. There is about them a simple beauty, a rustic elegance, which surpasses the most brilliant tints, unaccompanied by an elegant form.

The oak tree confers great benefits on man. It exercises, as he contemplates it many faculties, of his mind, and supplies many wants. Its bark tans his leather; its galls are necessary for his ink; its timber is the "prop of his house;" and it supports the roof, "vocal with his Maker's praise." With the oak he grooves the waves, and ventures on the treacherous sea; and he sleeps in an oak coffin. The acorn cup *full and overflowing*, sums up the oak's utility.

The mulberry (*Morus*) next to the vine is the most important of fruit trees. Not that it contributes more than most fruits to feed our appetite, but that its leaves feed the silk worm. The fruit of the black mulberry is choicest to the taste; yet the silk worms will not thrive upon its leaves. The white mulberry whose fruit is poor, feeds them best. Those trees whose leaves are taken to feed the worms, scarcely bear any fruit. And so it is with man. If part of the food that should feed his *trunk* is taken away he cannot bear the fruit he ought.

The fig (*Ficus carica*) in its native climates bears at most seasons of the year. The *Bōcor* or early ripe figs are mentioned in Jeremiah xxiv. 22 as the best; so they were compared with those who had the best place among the captives of Judah, who were carried into the land of the Chaldeans to be preserved; while the "evil figs" mentioned in the same chapter are the *Karmouse* or the summer figs, which from being frequently over ripe, will not bear transportation, but must be eaten on the spot—types of the slaughtered Jews.

Figs being so nutritious and supporting, are a type of what the Israelites should have been—the means of nourishing the whole world. The figs of Syria still show this power, by being carried into every country as food, and obtaining a preference over most dried fruits. The barren fig tree of the New Testament, like the green hypocrite, spread his leaves, showing that

he was in full health and vigour to bear fruit, but would not. These leaves were only a cloak, to cover his naked branches. Adam hid his shame with fig leaves in the same manner; he had not brought forth fruit that could be accepted by his Lord, any more than the barren fig tree, bore what could please "the Last Adam."

The hemp (*Cannabis sativa*) is one of the most important of plants, being applicable to an immense variety of textile purposes. To the making of sails for ships and windmills; for tents, cordage, nets, and twine, with their many uses. The natives of India smoke the leaves of the hemp, which are more intoxicating than tobacco, and the practice is difficult to get rid of when once acquired.

Most habits are difficult to break; they require to be cut by the sharp edge of moral feeling. Hempen cords can be easily cut; but if large and powerful they are difficult to break. They hold us by the neck until we are dead; and even when small they can catch us in a net from which we cannot escape. A stronger mind like a hempen cord may carry us over "seas of adversity," or through the Windmill of Passion, which may grind our very bones to dust. Some extraneous power can alone deliver us from this "Hempie" (Scotch), this otherwise unconquerable "She."

The nettle (*Urtica*) is a virulent plant. When it comes in contact with a delicate skin, its minute hairs produce inflammation. If you touch it gently you are stung; but if you *boldly* seize it, you are not. Which affords a moral lesson as to the means of treating the cowardly, the treacherous and the venomous amongst men. The nettle is a good ingredient in soup, its poisonous properties having been destroyed by the boiling water. This is but another proof that things are never poisonous unless wrongly used; and that those which are most venomous, may be made sometimes nourishing and wholesome.

Box (*Buxus sempervirens*) is a tree of slow growth, and as a usual accompaniment grows to a Great age. The wood is very durable and is invaluable to engravers. Its leaves being evergreen and the wood almost defying decay, are very significant emblems of immortality. No leaf lasts longer green.

The spurge (N.O. EUPHORBIACEÆ) is of a poisonous family as this phrase is popularly understood, but our British species are small and insignificant. When the leaves or stalks of the spurge are broken, they are seen to be full of milky juice. This sham-milk, like that of most milk yielding plants, is acrid and poisonous. Milk being a type of wholesome food, this is significant of poison offered in the form of nutriment;—most human poisoners, use a mask. These plants are of little ordinary

value in our country, but were formerly used in medicine. The very name "spurge" is but a slight improvement on purge.

The spurges do not attain arborescent dimensions in this country, but in Africa they grow to the size of trees, both in the tropical and southern regions, where they are largely used for poisoning man and beast. The poison takes effect through the blood, so that arrows dipped in it, are readily available for the destruction of life. A single plant, falling into a pond of water may destroy a whole herd of Zebras (*Livingstone*), while upon man and cattle, it acts merely as a violent cathartic. These plants are types of witchcraft or incantation, which in Africa they are used to punish.

The broom rape (*Orobanche* that is *vetch strangler*) is parasitic on the roots of plants, not being able to grow in any other manner. It has no leaves to draw sustenance from the air, which partly explains its parasitic character. Plants have their parasites as well as man and animals; those on the latter, are usually of a lower class than themselves. But here we have a plant, wanting some resources of ordinary vegetation; yet as regards its flowers and seed, not behind many self-supporting orders. Such is the case with some men not otherwise contemptible; but who are obliged to play the part of sycophants, not being able apparently, to exist on an independent footing. If the protecting plant be *weak*, this parasite may destroy it. A man of fortune as often loses his substance through an idle and worthless companion.

The thorn apple (*Datura stramonium*) is of the poisonous family of nightshades. Taken in large doses into the human body, it produces vertigo and madness; sometimes permanent. It is a powerful narcotic; but most narcotics have a twofold action. In small doses they stimulate; in large doses they intoxicate. This shows great analogy to the effect of undue excitements on the mind, or unnatural and unhealthy pleasures. The mind feeling lassitude; a craving vacancy unfilled by its reserved force, seeks for what are usually called "stimulants." These producing a temporary excitement, are followed by still greater depression. A stronger stimulant is taken, a narcotic, producing tenfold lassitude, weaving a misty net over the mind. Such is the result of devouring mental food that stimulates and morbidly excites the feelings and lower propensities, producing at the same time, a deadening effect on the moral sentiments. How different is the influence of fresh objects, well worked into the mind, reduced into its very substance, to form the foundation of what is new, true, and healthy in growth. This is real progress to perfection in

what is good, as opposed to retrogression—the utter marring and corruption of the moral nature.—The last stage is madness.

The deadly nightshade (*Atropa belladonna*) is a dark sombre looking plant, bearing livid, purple flowers, inspiring admiration and dread. The berries resemble small, wild, black cherries, one of which has caused the death of two persons; for it contains the deadly alkaloid atropine. True to its name, the "Belladonna" is a type of a beautiful lady. The physiognomist, discerns her character at once, and hardly needs to be told that she has slain two men, with those black eyes. The belladonna is a valuable medicine amongst homeopathists, with whom "similars are cured by similars;" which explains how it is, that he whose happiness is *poisoned* by the venom of one beautiful lady, is entirely cured by the healing virtues of another. This belladonna acts greatly on the eyes, producing in them a tendency to roll and languish. Belladonna occasions a dilatation of the pupil of the eye; which is followed by gasping and violent palpitation. A similar change comes over the eyes and heart of the *pupil*—in love when he has found a *mistress;* he succumbs,—a slave of Belladonna.

The woody nightshade or "bitter sweet" (*Solanum dulcamara*) is rightly named in Latin, as well as in English, its flowers are of a beautiful purple, and its berries slightly resemble red currants. Ignorant children have eaten them in mistake, and thus met their death. The berries are first bitter in the mouth, but sweet afterwards;—a type of trial rightly taken.—As such it is a most useful medicine; while it is the means of death if trifled with. In this plant the bitter comes first, and then the sweet, which is better than the sweet first, and the bitter afterwards.

The potato (*Solanum tuberosum*) belongs to this deadly class; and some parts of the plant show strong affinities to the nightshades in their poisonous properties. Yet the tubers are the main support of a large number of our population, and are the most wholesome and useful of vegetables, in the limited vocabulary of cooks. But to take the potato as a substitute for any one of the cereals, is a great blunder. The rationale of this is simple. Gluten is not contained in the potato, to a sufficient extent to place it in the same category with the "true foods," on which man can perfectly thrive alone. This is partly explained by the potato belonging to the class it does; being of a very small band of *wholesome* brothers in a poisonous order. A sort of Lot family in Sodom; or a little Abijam in the house of Jeroboam.—The *Solanum Sodomeum,* is one of the poisonous plants of this family. The shoots of potatoes are not wholesome; neither

are the stalks, leaves or apples; significant of the division to which they belong, and of their bad properties. Those that spring from the potato, as well as those from which it sprung, are alike deleterious; although it is in itself good, if well cooked.

Those strongly scented herbs which perfume gravies, and china jars, mostly belong to the gaping labiate class (*Lamiaceæ*). The flowers by their shape remind us of tongues; and surely they act as powerfully on our tongues, as on our sense of smell. Some of them resemble in odour the least pleasant animal secretions, which the apothecary by mixing with other ingredients turns into the most delicious perfumes. Since the middle ages these plants have been moral emblems. Thus mint, is a type of virtue, sage of wisdom, thyme of longevity, its odour being so permanent; rosemary of invigorating fragrance, and lavender of enduring modest worth, that is always pleasant, and can hardly be too strong.

The convolvulus (N. O. *Convolvulaceæ*) belongs to an exquisitely graceful family, not excelled in beauty by any class of plants. They creep or climb with an easy, negligent air, put forth their lovely delicate flowers as the sun shines, to close at even. They never can rise alone, but must cling to some object, and bind what they seize on, with their net of corded stems.

The convolvulus tribe is typical of that class of women that cannot get on alone, but who embrace their supports, and form wreaths that envelop and encumber. They are difficult to shake off or get rid of, may be torn and crushed, but have like the convolvulus a vitality well nigh inexhaustible. Thus some women will endure a great amount of ill usage from their harsh male relatives, and yet still cling with affection to them.

Scammony (*Convolvulus scammonia*) is a well known purgative resin, derived from a plant of this order; it has all the climbing tendencies of its kindred. It reminds one, of those who by their violent conduct, reduce those who support them, to a "shadow of their former selves," which is the *effect* of an overdose of this drug.

The gentian (*Gentiana lutea*) is reckoned a good stomachic and fine tonic, by those who believe in *tonics*, or in the good action of bodies in the stomach of man—that have no place there. The stomach is a private workshop, into which from its peculiar constitution and construction, no object should be admitted, "EXCEPT ON BUSINESS;" if it is to be a well ordered division of the human body. Raw material for the supply of the great factory, may be brought in, fuel for its furnaces, grease for its machinery, and various chymicals may be ad-

mitted; but no mending is allowed on the establishment. Everything must be made NEW. Human life can only be maintained by allowing the living organism, *to arrange itself*. It is this power that constitutes useful medicinal agents, that of modifying the action of particular parts of the body, so as to allow of the increased action of others. We must remember however, that it is with the body as a *whole*, that we have to do. Remedies such as gentian, are on this ground fading from view, in the prescriptions of modern physicians.

The primrose (*Primula acaulis*) whose delicate sulphur coloured blossoms, are the flowers most sought for in our childish days, are our first loves among the flowers; and perhaps the types of our first loves among the maidens. So sweet, so fresh, we press them to our lips although a tear of dew is on their eye; the tear which accompanies spring; the ornament of living blossoms, soon perhaps to perish.

"The rath primrose that forsaken dies."

The heath (*Ericaceæ*) is an order of plants, that covers vast tracts of country in the northern parts of Europe, and great districts in Africa. Even those that grow in bogs, have very little succulence. There is a great regularity about their mode of growth, and they with difficulty wither. The flowers are beautifully delicate, and when in full bloom on a Scotch moor, intermixed with yellow broom, they form a charming picture, both for man and bees, which enliven the still landscape, by their ceaseless hum. Heaths grow where many other plants will not, and form the main food of some of the grouse tribe. They are a type of useful industrious races, who are very *poor* in themselves, but manage to produce what is of great value, in proportion to climate and soil.

Dandelion (*Taraxacum dens-leonis*) is a composite flower, being made up of a variety of florets. Its blossoms are a rich solar yellow, and its seeds are furnished with a winged pappus, which enables them to fly to districts, that could hardly otherwise be reached. Evil inclinations are as difficult to extirpate and subdue as this plant, and are gifted as it were with *winged seeds*, which carry them over the Earth. The dandelions call for great exertion, on the part of those who would confine them to their proper limits. Most weeds are a type of those evil inclinations and passions so difficult to subdue, as contrasted with the "cardinal virtues" which like more tender blossoms, require the utmost art of skilful cultivators.

The thistle family presents to our view, lovely flowers of "imperial purple" or snowy purity; yet are furnished with such a set of formidable thorns, that it is unsafe to meddle with

them, without a more powerful weapon than man's unaided hand.

The Scotch chose the thistle as their emblem, thinking it perhaps a type of their nation, for both are unsafe to handle; both show much beauty, both are very *hardy*, growing everywhere, and cannot be extirpated, but are not everywhere "a weed." In some countries Scotch thistles, are potted and petted as curiosities. The English chose the rose as their emblem, and suitably it represents English society, which has gathered around itself such beautiful partners, as the typical thistle and shamrock. It has been called the Queen of flowers, as an English maiden is the Queen of her Sex. These typical "flowers" are composed of the choicest elements of the three nationalities. Such are the English, Scottish and Irish maidens, "the three graces" of the United Kingdom.

COMMON CHAMOMILE, ANTHEMIS NOBILIS.

The common chamomile, the species usually cultivated for medicinal purposes has been celebrated for ages. It is another example of the composite order.

The sunflower (*Helianthus annuus*) turns towards the Great Centre of our system, as often as the season of its bloom comes round. It points towards heaven, and is a type of those who in an especial manner, are reflectors of celestial light; who *turn* towards it, follow it strictly in its course and enjoy special blessing in consequence.

The teasel (*Dipsacus fullonum*) is a very useful plant being necessary to the combing or teasing out of cloth, for which no fitting substitute capable of "raising the nap," can be found by the fullers. The hooks of the calyx are very penetrating. They remind us of those characters in society, who make our hair stand on end with mental electricity, which assists however in promoting the *circulation*, and clearing us of much extraneous matter, that cannot be otherwise got rid of; clinging about our minds and entangling our ideas. In the process of weaving cloth an extensive structure is got together; but one requiring polishing and combing, to fit it for useful purposes.

The honeysuckle (*Caprifolium*) is a plant that the bees love. If asked "where the bee sucks"? we might say, "In the honeysuckle;" one of the plants which give to our garden honey its choicest flavour. It cannot stand alone; it requires the support of brambles, or of any stouter plant that happens to be near, to shelter it. Each flower resembles a beautiful vase or horn finely curved at the bottom, enclosing a nectary fit for Flora's own lips. A true cornucopia, ready to pour out the sweetest fragrance, to the air, or honey to the taste.

Some of the cucumber family are poisonous; and others are eatable, but unsuitable to form a large portion of human food; like the potato and tomato, which belong to another class, where many poisonous plants are also found. Those who belong to a *bad* family, are not to be so thoroughly trusted as others.

The pumpkins exceed in size the fruit of all other plants. They are types of great empires of rapid growth, which *last* but a short time, have little substance; but are as "flatulent" in the moral world as these vegetables are in the physical. Expanded to an enormous size themselves, they have no understanding of anything that is more compact or less windy. Pumpkins grow best in America.

CHAPTER IV.

A NEW LANGUAGE OF PLANTS.—*Continued.*

VINES—UMBELLIFERS—PEAR—CLOVER—FLAX—WOOL—SILK—OPIUM—ALOES—BAOBAB—BANYAN—MANGO—CAOUTCHOUC—SUGAR—BAMBOO—MAHOGANY—PALMS—AGRICULTURE AND HORTICULTURE.

THE ivy (*Hedera helix*) is evergreen, and survives to an immense age, perhaps longer than any other climbing plant of Europe. Most creeping plants have graceful leaves. With these the ivy is doubly furnished, having a light and rich dark green foliage. It is a bitter and unwholesome shrub; but its blossoms have a rich smell, and attract numerous insects in the late autumn, when other flowers are withered. The ivy loves to climb walls or large trees, doing great injury to both, but giving them a green picturesque appearance. It assists the decay of the trees, decomposes the mortar, and helps by its spreading branches, which grow into the stone, to reduce many a noble pile to a ruin.

The true vine (*Vitis vinifera*) is amongst the most valuable of plants; its leaves are so graceful, its tendrils are so entwining, its fruit is so delicious; and unlike the ivy it harbours few insects and reptiles. The vine is a type of a fruitful, good and useful woman, the ivy that of a graceful daughter of Bacchus, who exercises over many men a fascination, not to be easily shaken off. Numerous birds make their nests in the boughs; numerous insects reside under the shadow of the ivy; the type of the vices Bacchante shelters. The whole growth of the ivy and that of the population it protects, tend to corruption and decay, but this very decay cheers our sight, by reminding us of what is past; and by contrast with surrounding objects, shows that progress has been made.

The umbelliferous plants are mostly poisonous, but yet some are amongst our most valuable vegetables. Thus we have the carrot (*Daucus sativa*), the parsnip (*Pastinaca sativa*), the anise (*Pimpinella anisum*), the parsley (*Petroselinum sativum*), the celery (*Apium graveolens*), amongst wholesome plants; while we have the hemlock (*Conium maculatum*), fool's parsley (*Are-*

thusa cynapium), water drop wort (*Œnanthe crocata*), and the water hemlock (*Cicuta virosa*) among the poisonous plants. Many of these have a superficial resemblance to each other, but can be at once distinguished by their fruit. Thus what is wholesome and noxious may be sometimes confused; but the distinctions are in reality widely drawn; the trained eye can detect them. "YE SHALL KNOW THEM BY THEIR FRUITS."

The cherry (*Cerasus communis*), the laurel (*C. Lauro-cerasus*), and the Portugal laurel (*C. Lusitanica*), all contain prussic acid, either in leaves, flowers or kernels; which gives to them a portion of their rich flavour; but at the same time, renders them the *trustees* of poison.—A gift liable to abuse.

The shape of the fruit of the pear is typical, and is often given as an illustration of form. A round drop is a little world, and as it remains attached to some corner of the great world, it is a hemisphere, but when ready to fall, it assumes a *pear-like* form, and descends from its parent sphere. The fall is great, but the new shape is more in harmony with its transitory condition: it becomes a perfect sphere the next second. These differences of form illustrate stages of progress. The metamorphosis of form illustrates growth and development.

The strawberry (*Fragaria vesca*) grows nearest the ground of any of our fine fruits, creeping and trailing along the surface. It is perhaps the most wholesome of fruits, and the most easily gathered by children. The tallest of us must bend to pick up jewels, and the taller we are, the greater is our descent. The fruits of the earth are not fine, in proportion to the loftiness of their growth. The strawberry surpasses many high trees in the quality of its fruit, but we must stoop like children to gather it. We must bow our heads even to the dust, if we would be refreshed by its juice.

The gooseberry (*Ribes grossularia*) is protected by prickles and has rather a tough skin. This is a little surprising, when we see naked fruits like the strawberry without any, which yet are apparently of more value, as objects of beauty, flavour, and food. We ask the reason of this, and find that this double provision, made for its protection; is that this coarse fruit is intended to supply some *necessary* in the world's economy. That great want being of wholesome vegetable acids, such as the malic and citric, which abound in the gooseberry. Strawberries could not supply this want, and are therefore not thus doubly protected. In morals the indispensable is fenced round with extraordinary armour.

Cows, sheep, horses and pigs, are said to live well when they "live on clover." It is food however of a highly stimulating and exciting kind, extremely flatulent, causing death by a sort

of explosion, in cattle which eat too freely of it. Food of the most nourishing and stimulating character, is not the best for animals, or man. In morals, when one has been *underfed*, too free a use of rich food is destructive of *life or reason.* A mental apoplexy may follow a mental starvation.

Although natives of China and Hindostan, the orange family have been dispersed over most parts of the earth. Oranges are of the same shape as our globe, and the citron and lemon by their form, illustrate its orbit. The orange was perhaps the golden apple kept in the garden of the Hesperides; to obtain which was one of the labours of Hercules, who desired universal dominion. The orange being so nearly the shape of the world would favour the idea of its being referred to in classic mythology. A species of orange has been called "the forbidden fruit," a significant name.

"Solomon in all his glory, was not arrayed in vestures," equal in brightness to the petals of the geraniums. Not even the dyes refined by the culminating chymistry of ages, can produce, or rather apply tints like these; for the effect of colours more consists in their application than in their principles. The imitation of geraniums in paper or wax is a failure. The lilies of Solomon can be successfully imitated by modern art, but not the geraniums of our day. A century ago they were confined to the gardens of princes or nobles, and as rare as Tyrian dyes; but now finer flowers grow in cottage gardens, than fifty years ago, were known in the choicest greenhouses of our palaces. A similar change has come over the art of dyeing. Finer hues of imperial purple, scarlet and orange, than ever adorned Augustus or Livia, now decorate penniless village beauties.

The fibre of flax (*Linum usitatissimum*) is very strong; but is much stronger *before*, than after it is bleached: which rule applies to many substances. Sugar has a stronger taste before being refined, than after; although in reality, it contains rather less saccharine matter. The polished man whose blood has been much refined for several generations, has less physical strength than a rough, as it were unbleached rustic. For rough hard work, the bone and muscle, of "the son of rude toil" is preferred, but where toughness and balance of frame are required, the gentleman can endure the longest. Fine spun linen, from the close twist of its fibre glides smoothly over obstacles and corners, which would catch and wear out the rougher cloth. If too finely spun however, the linen is only fit for very fine purposes; and so our doubly refined men cannot bear what is rough.

Flax is eminently illustrative of the restless, enterprising, "individual" labourer, full of energy in everything he does.

Every part of the flax is full of strong tough fibre, which also illustrates the powerful muscular system of European nations, as contrasted with that of the natives of tropical or sub-tropical regions, where the cotton (*Gossypium vitifolium*) is grown. Like the cotton plant, a very small portion of what the natives of hot countries produce is *profitable:* their labour is not profitable in proportion to its expenditure. Flax is a much longer, but harsher fibre; unlike the cotton of the south it has not a warm, downy, sensual feeling, to the touch.

Wool and silk, are the great productions of the animal kingdom, as contrasted with the linen and cotton of the vegetable world, in their application to the clothing and wants of man. Wool answers to cotton, as the warmer of the two, but silk answers to cotton, as mostly the production of hot climates. Wool being the worst conductor of heat, is the best for external garments in cold regions. Wool and flax, are the national clothing of northern civilized nations, and forcibly illustrate their character. Northern nations, possess both the original dirtiness, and artificial cleanliness of flax; a type of the progress of those nations in civilization. Cotton, originally of the purest white, receives every stain. It is a fibre ready for use, while flax has to be cleaned and separated. The cotton fibre passes from a pure, to an impure state; illustrative of southern progress in impurity. Wool is a type of the non-conducting character of the Teutons, who receive impressions with great difficulty, yet long retain them. The Teutons are the great woollen manufacturers of the world.

The sweet-scented violet (*Viola odorata*) is loved by all. Its blossoms are nearly hid in its heart-shaped leaves, which appear first, like those who offer their whole hearts, and their gifts afterwards. Violets are far too sweet to be trampled on, but invite us to stoop down and pluck them. The violet's hue is not of an imperial purple; not the type of those allied to royal blood, but of modest and retiring worth.

The heartsease (*Viola tricolor*) is magnificently coloured, purple and yellow being the prevailing hues. The mind sighs for dominion illustrated by purple; for immortal light illustrated by yellow, approaching that of gold. When it gets these,—the colours of this flower; it finds, "Heart's Ease."

Mustard (*Sinapis nigra*) is the most biting and pungent of our spices, and is an indispensable accompaniment of our national roast beef; which will not even go down properly without this addition. John Bull is fond of what is juicy and rich, which however like a good joke, must have a slight flavour of sarcasm to be thoroughly and generally appreciated.

Opium has as soporific an effect on the conscience of those

engaged in its traffic, as the drug has on the minds of those who partake of it. Both forget its evil effects. Those who advocate opium eating, dwell much on its advantages as a deadener of pain. It may alleviate Homeopathic doses of pain; but it may in turn produce Allopathic doses of misery. The dreams of those under the intoxicating influence of opium are delightful; and are said to resemble visions of Paradise. But as the mind awakes, tortures of the most fearful kind succeed. Greater horror steals over the mind, than most men have conceived, or dreamed of in this world. Under its influence, Death is not dreaded; and if the wretched sufferer cannot be gratified by another dose, he often feels inclined to Self-Destruction.

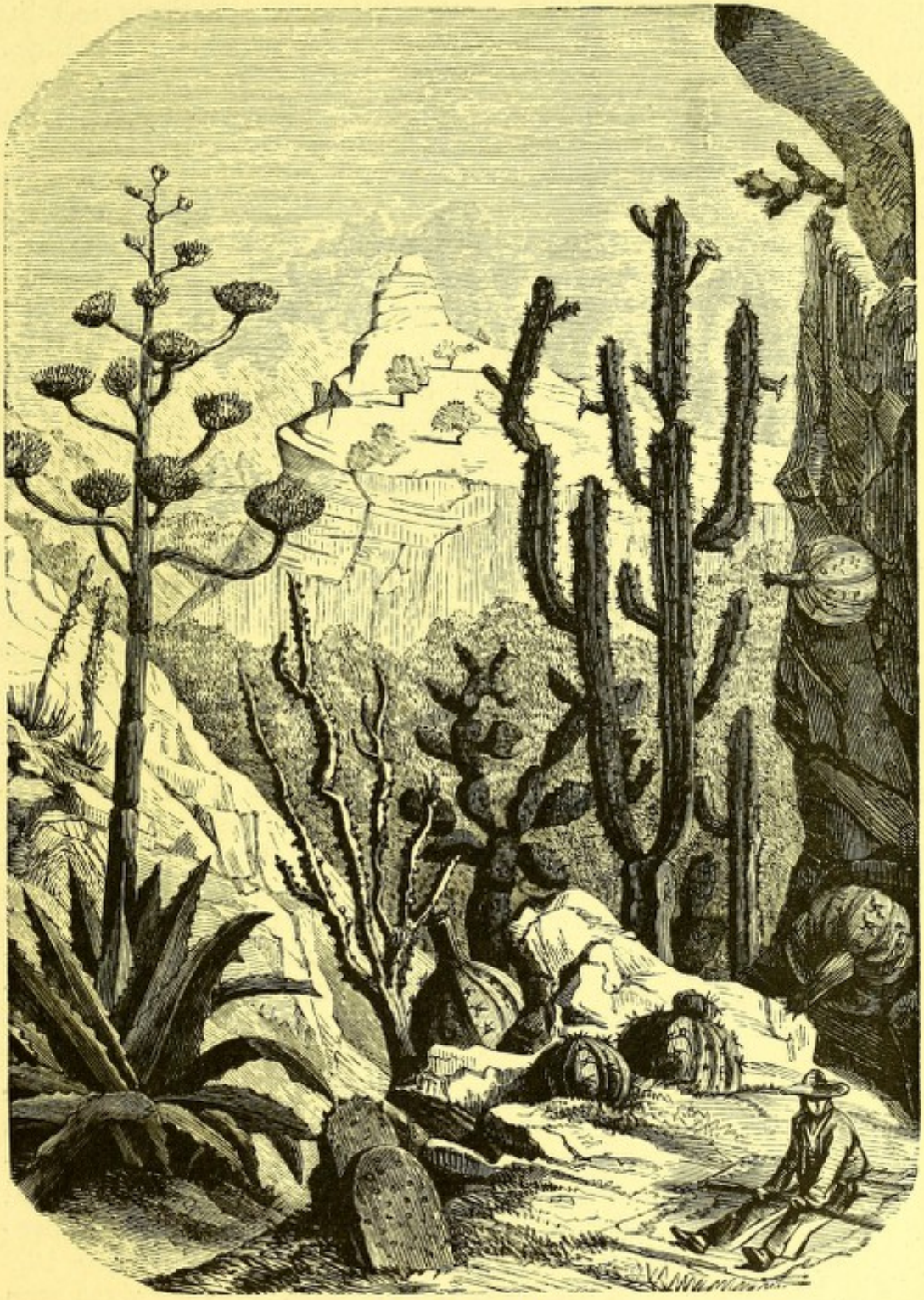
Opium has its use, being one of the most effectual narcotics, and in minute doses, it is a soother of the nerves, without a narcotic effect. Poppy seed has no sedative property; the oil in the East being used as a substitute for salad oil in cookery; and the refuse of the seed when the oil is pressed out is very effectual in fattening poultry. The seeds surrounded by the narcotic poppy head, are a type of death and resurrection; but of that resurrection followed by a second death. The corn poppy is our common example of the genus PAPAVERACEÆ; it is similar to yet much milder in its narcotic effects than the white poppy. The inhabitants of India, China and Turkey, are much more addicted to the use of opium than we are, and have a more powerful plant to use as a medicament.

The *Agave Americanus* or American aloe, spreads to the extent of 20 feet, and bears a flower stalk 18 or 20 feet in height, resembling a pole on which a series of little lamps are hung. In Mexico, it plays an important part in the domestic economy of the natives. The juice is fermented and becomes a wine,—the "*pulque*" of the Mexicans, by them preferred to all other intoxicating liquors. The removal of the juice just before the flowering, causes the death of the plant, which can only yield it, when it has attained the age of fifteen years.

A young man may live quietly all his boyhood; yet fall a victim to a love of drink, in the *flower* of his age. Mexicans attain their adolescence at FIFTEEN years.

Africa is the stronghold of aloes. The Birman empire furnishes the "lign aloes" (*Agallochum*), and East Africa and its islands, yield the plants which supply us, with that gum resin the Socotrine aloes. These grotesque, rugged, gloomy trees, with their immense flowers, remind us of the development savage life receives in these countries, contrasted with the civilization of Europe—typified by the delicate character we recognize in European lilies.

The cacti (N. O. CACTACEÆ) are a stiff, unyielding class of plants, and remind us much of corals amongst zoophytes; or



MEXICAN PLANTS.

Aloe. Agave. Mecal Cactus. Melo Cactus. Cactus, or Gauos.

warts and excrescences on our bodies; the soil standing for our flesh. Some resemble inanimate objects, such as candelabra;

others are spined like sea eggs or hedgehogs. Out of these grotesque stems, spring magnificent flowers and many yield a pleasant fruit, such as the Indian fig, that feeds the cochineal insect (*Coccus cacti*). The *Cactus melocactus* is protected by formidable thorns, and affords when crushed a juicy pulp, which the driest situations in the hottest summers do not parch; but affords to man and beast, when oppressed with thirst, a delicious refreshment. This is truly "a root out of a dry ground;" yet beset with thorns and prickles which render it dangerous to the careless touch, but those who know its value, can draw sustenance from it even in the desert. A type of the citizen of the future world, who find streams everywhere; even in "a thirsty land." (Compare Psalm lxxxiv. 6.)

These cacti afford the best and most impenetrable hedges, for the protection of fields and gardens, against the visits of stray beasts or robbers. An enemy to one, may be a friend to another.

The Baobab, monkey bread, or Ethiopian sour-gourd tree, is one of the largest in the world, its trunk attaining a diameter of 30 feet. The branches stretch over an enormous expanse, and the hollow trunk is sometimes used as a stable or hut. It is a low spreading tree, not often attaining a greater height than 60 feet. It grows to its full height in 30 years, but continues to expand in girth for a very long period. Thirty years is the limit of man's growth as regards height; after that period he merely spreads. These trees are exceptional in their mode of growth, and are types of the period of man's existence on earth. Adanson calculated that the largest of these trees is at least 5,000 years old. This would certainly exceed the *post Diluvian* Life of Man on Earth, as chronology has already run.

The bread fruit (*Artocarpus incisa*) takes the place of the cereals in the Polynesian islands. It requires cooking, but not the long elaborate process, which grain undergoes, to fit it for man's use.

The natives of Europe have industry as it were forced upon them; such being indispensable to the very existence of a large and dense population. But the inhabitants of tropical regions usually find sustenance with much greater ease; and are therefore not so stimulated to that labour which profits mind and body. Nations, as also classes of society, are honoured in proportion to the work put upon them.

The highest men in the state labour most. The lowest men in the state labour least. This distinction is more inclusive than mere class distinction; for a man may labour like a giant as a day labourer, and a man may labour like a fly as a prince. But the *true* Prince in mind as well as in station, performs the

greatest labour of ALL, and will receive the highest reward. The bread fruit and the plantain, so useful and valuable where they grow, were not we think, prepared as a compliment to the highest order of man. They were given to races, who would hereafter live in the tropics, and who would spurn the labour, allotted to the more industrious children of Adam. The bread fruit was bread from heaven, amply sufficient for the supply of every want, and the type of the gospel as less perfectly received by those Polynesian and African races, than by their more highly gifted Semitic-European brethren.

The mimosas (N. O. LEGUMINOSÆ) or sensitive plants, are most abundant in Brazil, and in those parts of America, where vegetation attains its utmost development. They have an exquisite form and delicate leaves, and are surely amongst the highest vegetable organisms, even in the continent of America. Their feathery leaves surpass in beauty, the acacias of the Old world. If the feathers of the birds of Paradise, are suitable to their high sounding name in the world of birds; surely the graceful flowers of the mimosa, are entitled to a similar place amongst vegetables. This is the last finishing touch, which the Creator has given, to His choicest domain of plants.

One species (*Porliera hydrometrica*) is a natural barometer, indicating by the opening or closing of its leaves, the approach of dry or wet weather; like our beautiful little pimpernel (*Anagallis arvensis*). These heralds of change, are sufficient for the savage or uneducated, but man as he grows in civilization, requires the aid of more delicate artificial instruments—such are more under his control. Had he the same understanding of the construction of the animate indicators, that he has of the inanimate he would find them answer equally well, but he would then understand what life is. Then the variations in the atmosphere, would be clearly seen. Such changes, are types of changes in the Moral world,—for both are affected by analogous agency.

Dracænas or dragon trees, grow to a prodigious size in Africa and the Canary isles, in one case attaining the circumference of 70 feet. They grow in a curious manner. The branches first springing from the root, and then proceeding down to the earth they close round the tree; so that each tree, is in reality a bundle of trunks united.

This mode of growth is suggestive of that of a Nation, which enjoys equal, moral and material advantages. The nation approaches heaven first, by the cultivation of morals; and when it gains moral strength, turns again to earth, like this tree, to draw out of it that sustenance which it affords. The moral elevation of nations, like the material elevation of trees, has a

certain limit. The descending branches of the tree reach the earth in which they take root, and again ascend to bear many more leaves. This upward and downward progress is favourable for the growth of the tree. Moral elevation and material wealth, should accompany each other. The nation of Israel's progress has been, and will be of a similar character to this ; *first upward*, and then *downward ;* that they may be firmly Rooted in the Holy land. That they may spread and increase in size, and in number of branches ; yet all to proceed from one vast trunk. (See 2 Kings xix. 30.)

The banyan (*Ficus indica*, N. O. ARTOCARPACEÆ) is the Great tree of India. Its trunk is large and its height considerable, but its spread far exceeds that of any other known tree. It is in itself a forest, or a colony of trunks ; for each great branch, sends down shoots that root themselves, and become to a great extent independent of the parent tree ; forming a harmonious society. In time each rooted stem becomes a Trunk, in its turn to become a progenitor of other trunks. Therefore the tree lasts almost for ever. It is the tree whose existence most nearly approaches Immortality ; and gives us the best idea of the "Tree of Life."

The pitcher plant (*Nepenthes distillatoria*, N. O. NEPENTHACEÆ) bears at the extremity of its leaves, a jug shaped vessel, which collects water, and when full, a small lid with which it is provided, closes, so that evaporation is effectually prevented. A wonderful adaptation of means to ends. The water is remarkably cool and pure. The pitcher is suspended by a curled tendril, which waves towards the stranger, whether man or monkey, as he moves the bushes in its vicinity ; expressively indicating that he should drink. The impure water in hot climates, being rich in *spores* that poison the body, is eminently illustrative of corrupt morals, which "poison the mind." But in every land pure water, can be obtained from pure sources ; or foul water can be purified. These little pitchers of wholesome water, resemble those who do good, and live morally in the corrupt atmosphere of India and China. When they acquire knowledge of purity ; the moral atmosphere is so dry and unfavourable for its reception, that they feel inclined to shut it up within themselves, but the thoughtful and congenial, who are willing to receive what is pure, come to them and are refreshed.

The Pine apples (N. O. BROMELIACEÆ) are a class of plants peculiar to the tropics. Their flowers are brilliant ; their fruit is beautiful in appearance, and far finer in flavour than any other of large size. The great peculiarity of the plant, is that with the exception of a small bundle of leaves, and its root,—

when ripe it is almost all luscious, juicy fruit. It is solitary and unrivalled; it wears a sort of crown below and above. The upper crown is cut off, and planted in the earth; it flowers and bears this choice fruit.

The Pine apple is a lowly plant, illustrative of our Lord in humility. But with all this lowliness, it is acknowledged to be the choicest of fruits. The *spiny crown* on the top, is a type of "the crown of thorns;" while the prickly leaves beneath, are a type of those thorns which beset HIS path on Earth.

The mangosteen (*Garcinia mangostana*, N. O. ANACARDIACEÆ) inhabits the Spice Islands, whence it was brought into India, and other tropical countries. It has a large flower, and bears a fruit of the size of a small orange. The flavour combines that of oranges, raspberries, strawberries and grapes. It has a fine aroma, and is very refreshing. It is one of the choicest fruits in the world, not to be equalled by any tropical fruit, except the pine apple. It grows on a high tree like the citron. The common mangoes belong to this class, and have a rich and beautiful appearance. Few English fruits can be compared with it in beauty. The mangoes are a type of those fine and fleshy natives of India with the hue of Oriental beauty, but having qualities unpleasant to most Europeans. The mangosteen having so much more flavour, and being admired by all, is a type of those natives of a higher caste, who are not so numerous as those of a lower caste, but have more of the refinement and polish of cultivated life.

The calabash tree (*Crescentia cujete*, N. O. CRESCENTIACEÆ) furnishes in the hard shell covering of its fruit, a material out of which cups and bowls are made, similar to those usually formed of pottery ware. Nations of indolent habits, have utensils, as it were almost ready made for them; as well as food requiring little preparation. The fruit of the calabash is of various sizes and shapes, yet full of a nauseous pulp. Suggestive of the impure vessels, of the inhabitants of most tropical countries.

The castor oil shrub (*Ricinus communis*, N. O. EUPHORBIACEÆ) belongs to a poisonous family. The oil is one of our most gentle purgatives,—yet one of the most nauseous and sickening substances known to the human palate. The oil is expressed from the seeds, and the leaves are among the coolest and pleasantest external applications for headache. The leaves of many plants are useful in this way. We read in Scripture, that the leaves of the "tree of life are to be for the healing of the nations." The gentle *purgative* properties of the castor oil, may typify the means of purification, that should be used with those of weak constitutions which is at best extraneous and

unnatural, but necessary for purifying when the natural process of Moral Assimilation is interrupted. Violent, drastic purgatives such as the Croton oil derived from the *Croton tiglium*, lead to the destruction of the tissue that they are intended to relieve. Their abuse reminds one of strong remedial measures, intended to remedy lax morals, but which from being too violent, crush the subject.

To the same order, belongs the bitter cassava, (*Jatropha manihot*) which yields the tapioca and cassaripe of commerce. Its tubers contain a most wholesome and nutritious combination, of lignine, gluten and starch ; but which is protected by a poisonous juice, that renders the root in a fresh state deadly poison to man and beast. It is therefore apparently reserved for man, as food that requires the exercise of a higher intelligence than that of brutes to make it wholesome.

In the fiery tropics there are more instances of food and poison combined, than amongst ourselves ; and of what is healthy and right in morals being united with the pestilential and corrupt. The luxuriant vegetation, a benefit showered with a prodigal hand on the animal creation is accompanied by large animals of prey whose savage ferocity fills the forests with terror. The human inhabitants of many tropical countries have qualities which harmonize with such a fauna and flora :— *liberality* and bounteous *display*, are united with cruelty and profligacy.

One cause of these evils and crimes, consists in the mode of life pursued in the tropics, not affording scope for the full exercise of the mental powers in procuring the necessaries of life. Thus in South America the Cow tree, (*Galactodendron utile*) supplies no indifferent substitute for milk, without the labour attendant on the management of cattle. The cream fruit (*Roupellia grata*) and the butter nut of Sierra Leone, supply the place of those luxuries, of the animal kingdom.

Caoutchouc or elastic gum, is the produce of a variety of trees, belonging to the same natural order, as the spurges and the nettles. This gum is applied to such a vast variety of uses, that it may truly be termed protean. It is capable of being twisted and turned, stretched and squeezed, and yet always returns to its original shape. It is a type of spiritual influences which are various in their movements, and can apply themselves to so many agencies. The gum elastic is a compound of carbon and hydrogen ; the principal elements consumed by the oxygen of the air, in the important offices of organic life. Caoutchouc was not applicable to so many purposes, until a solvent was found, by which it could be applied, as a means of rendering clothing waterproof. Most articles of

clothing absorb in a great degree the water in which they are plunged; but this Indian rubber and its preparations, repel water as effectually as metal or glass, and yet possess extraordinary flexibility.

Had it been known in the middle ages, it would have been appropriated to Satan. The natives of Brazil and Malacca who procure it; by their low morals and mode of life, show that they are much under the influence of Evil spirits. Modern chymistry has called in the aid of sulphur, as a means of increasing the utility of Indian rubber. Our ancestors would have ascribed this to infernal agency, of which it may possibly be a type. Especially as aiding in the insulation of the Telegraph wires, which more nearly approaches the means of communication, which we suppose to be practised in the spiritual world, than any process at present known to us.

A great variety of plants yield in fruit, root, stalk and flower, saccharine matter of divers varieties; which can likewise be obtained by the decomposition of starch. What is sweet is usually considered pleasant. It is certainly a type of what is agreeable; but what is agreeable is not always wholesome. Thus white arsenic and sugar of lead, have a sweet taste, although so noxious generally to organic life.

The cultivation of sugar began in China, from whence it was dispersed over the more western parts of Asia, and reached Europe through Phœnician navigation. The middle ages fell like a dark veil over religion, science and commerce; and sugar was meanwhile lost to the West. Europe returning the invasions of the barbarous hordes of Asia, brought to her own shores the science, the luxuries and civilization of the East. The songs sung by the crusaders, might truly have been dulcet strains if they brought back sugar to Europe.

The sugar cane was first planted in Hispaniola in 1506; and soon the great profit derived from its culture, made it the principal occupation of the European colonists. If the Spaniards conveyed it to Mexico, the Portuguese did the same to Brazil; and the cane wandered as *the walking stick of civilization*, over the West Indian islands.

The preparation of sugar involved the expenditure of a great amount of labour, which in intertropical latitudes, Europeans felt unsuited to their constitutions. The aborigines melted away under the cruelties and new mode of life, forced upon them by their European masters. But the desire for sugar did not dissolve in the minds of luxurious Europeans, who were only stimulated, to offer in return for it their choicest industrial products.

Negroes in the Canaries and other islands of the African

coast, were found to answer so well as labourers, that in due time they were removed to the western world. Their docility, strength and good natured fecundity, rendered them the true rough labourers of the tropics. Avarice uninfluenced by feelings of humanity, caused their removal in a forcible and cruel manner, and their retention in slavery, at first little better, than was their frequent lot in their own country.

A nation was said to dwell securely, when it "dwelt under its own vine, and under its own fig tree." These are wholesome fruits. The Negroes of western Africa, dwell under poisonous euphorbias instead of Vines, and under baobabs instead of Fig trees. It has been frequently said that the Negroes brought to the West Indies, were snatched from peace and plenty, independence and the dignity of free men, to be ground under the iron heel of masters, in whom sentiment would fain see a greater savage than in any African chief. But if we look at matters in their true light, we must see that the condition of the Negroes at the worst periods of servitude in European colonies, was an improvement on native life in Guinea, under unrestrained cannibalism, fetichism, and wholesale slaughter.

The Negroes besides having been isolated for many ages from superior races, are inferior as a raw material. Had this *material* been better and the *manufacturers* of a higher moral caste, more might have been done. But "no amount of washing can make a black man white." Europeans wanted sugar, and like "truly practical men," did not inquire how it was obtained; although a few afflicted with "Mawwormism," that dyspepsia of the mind, turned sour at sugar because it was dark, and so it had to be refined for their use.

The refinement of sugar illustrates the abolition of the transport of "blacks" from Africa as regards the British colonies. A step having been thus made towards the civilization of sugar, a further improvement was suggested—that of double refinement. The early slavery in the West Indies was a type of the old sugar process; and the modifications of slavery of the "*blood refining*." While its abolition, illustrates the *double* or charcoal refining.

These changes in West India society and sugar manufacture diminished both "blacks" and molasses. That molasses which was formerly allowed to become rum—that rum that gave our sailors courage, and that sent legislators to St. Stephen's with the exciting spirits of punch. But now this molasses, is most largely turned into pure white sugar,—a process by which much saccharine matter is saved.

The bamboos (N. O. BAMBUSACEÆ) are colossal grasses. The *Bambusa tulda* of Bengal, attains the height of 70 feet from the

ground, in the short space of a month; which is an average growth, of one inch an hour (Hartwig). Few trees exceed them in gracefulness and utility, for they perform offices in inter-tropical regions, which surpass all other grasses in importance except the maize or the sugar cane.

The Chinese split the long stems into narrow strips, which they twist into cables as moorings for their junks; the same material furnishes their sails and rigging. In some of the southern provinces of China almost every house is built of bamboo, and almost every article of furniture, claims this strong material as its parent. The young shoots yield the fibre of which the best Chinese writing paper is made. The seeds are eaten with choice honey, or fermented into beer, within the vast Indian empire. All the bamboos have a coating rich in Silica; the prickly species actually strikes fire with steel. The bamboos have jointed stems and a light feathery foliage.

Few vegetables are so strong in proportion to their lightness, and NO plant in the world, has so firm and so hard a stalk of such rapid growth. It is an exception to what is usually observed in plants and animals, for the rapid in growth are commonly soft in fibre.

This is a type of genius, growing with immense rapidity and towering over the heads of its companions. Genius produces a permament impression on society; but its personal career may be *short;* or it may be *long.* It may blaze like a jungle of bamboos on fire for a short time, which leaves behind little but the smell of smoke and wreaths of white ashes. Or like the bamboo surviving for generations in a useful sphere, it may give the lie to what is said, of the early decay of rapid growth.

The Upas poison tree of Java (*Upas antiar*, N. O. ARTOCARPACEÆ) is far famed, but its deadly effects have been much exaggerated. According to the old accounts "no man, beast or bird, could pass near it and live." But this, if true was doubtless owing to the escape of carbonic acid, from fissures in the earth in its neighbourhood. This poison resembles the the superstitions of the Javanese, which act like a spell on their minds; binding them down to destruction and death. Yet antidotes exist; and this poison may be voided, ere its effects become irremediable.

Nux vomica has a powerful effect on the spinal marrow and occasions violent vomiting. In a very large dose death follows, and when taken in alcohol it is absorbed so fast into the system, that death is sometimes occasioned in a few minutes. The spine and brain, are the poles and focus of nerve action, which this first stimulates and then paralyzes. This substance has an

intensely bitter taste, due to the presence of the alkaloid strychnine. This bitterness is one great safeguard against its being taken by mistake.

It is a type of the action of literary works of a "sensational" character, which act on some minds in a similar manner to this poison; exciting the feelings to a violent extent, to be followed by a deadness and collapse of sensibility. Some persons take a pleasure in "gall and bitterness;" and in dwelling on the most painful, revolting and sickening subjects.

The mahogany tree (*Swietenia mahogani*, N.O. CEDRELACEÆ), is one of the most gigantic inhabitants of the forest, being often 100 feet high. It would need to be a large tree, to supply the numerous wants of civilized society. It is beautifully variegated, the finer varieties being feathered and striped in a remarkable manner. Its durability is great, and its dark red wood is among the most suitable for furniture.

The aboriginal nations of America somewhat resemble mahogany in hue. The Negroes resemble ebony. Ebony is a harder wood than mahogany. The "ebony" got the better of the "mahogany," and so the poor mahogany is cut down.

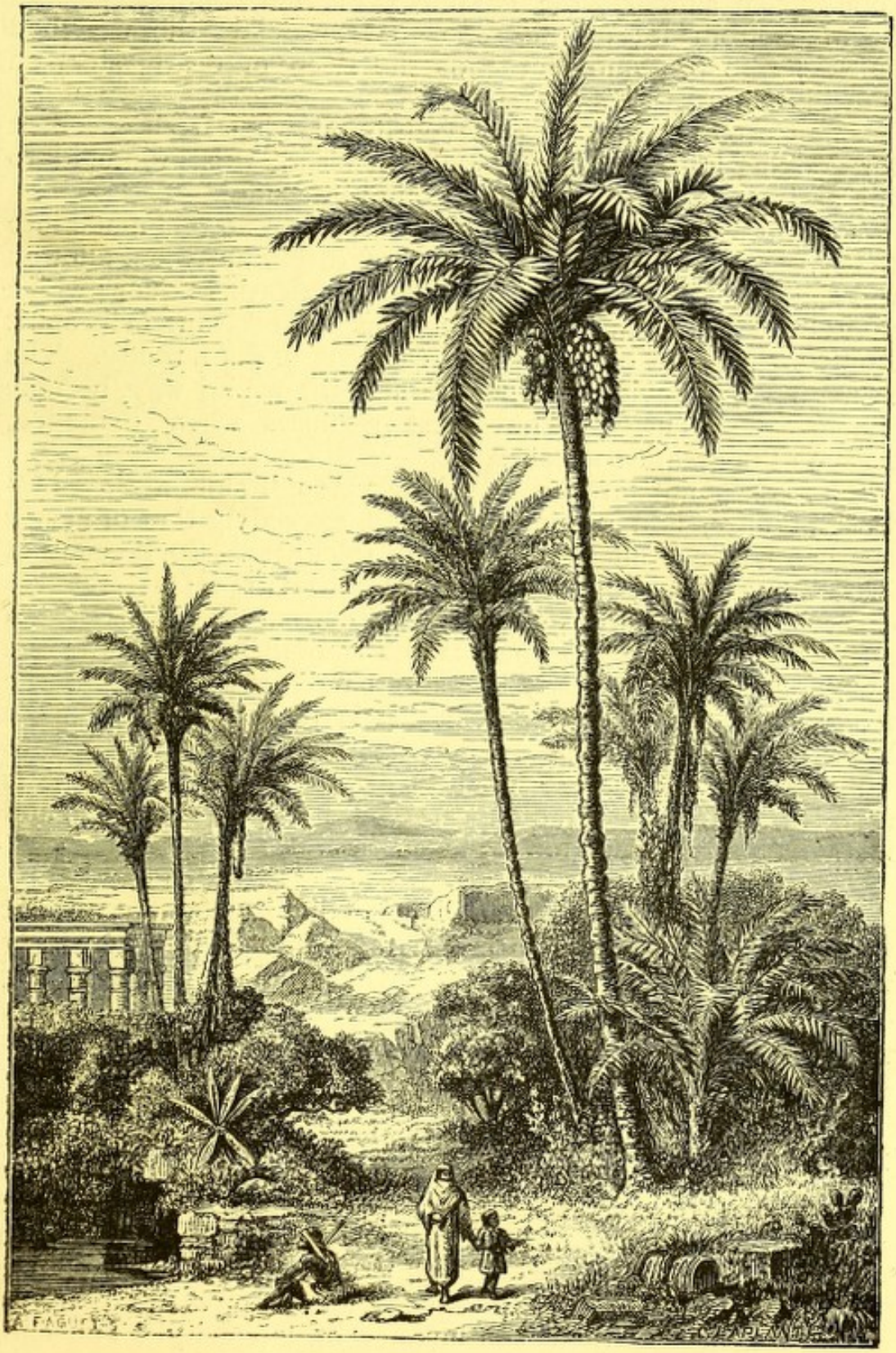
Some woods receive dyes, and are impressible in this way. A type of those individuals, who take their colorization of thought from others; harmonizing with them, if not assuming quite their complexion. Natural hues amongst woods may illustrate tints amongst races. The white deals and satins; the Scandinavian and light Indian races. The mahogany; the red Indian; the rose and Coromandel wood the dark Hindoos and Malays, and the ebony the Negro.

The Palms are characteristic of the tropics, of which they form, one of the brightest and most beautiful ornaments. Their graceful stems wave, and their leaves form a beautiful brush or tuft at the top, in some cases resembling a mop, in others a chimney-sweep's broom; while a third is like a feather dusting brush. They bear their fruit in clusters, the flower being enclosed in a spathe. They are no less valuable than beautiful; the juice of some, yielding when fermented, wine or other intoxicating liquor: others sugar in large quantities. The nuts of many species, yield fat allied to that of animals, which is of great importance in commerce; and is supposed by merchants, who wish to grow rich by philanthropy, to be the probable means of the Future Civilization of Africa.

The cocoa-nut palm (*Cocos nucifera*) grows nearly everywhere on the sea coast in tropical regions; and may be said to afford food, lodging and clothing. The Arabs consider the date a type of Providence, who presides over their destiny. The cocoa-nut is a type of Providence, extending over a far wider

circle, being produced alike in the East and West Indies, Polynesia and the Moluccas.

An entire ship may be built, laden, rigged and provisioned



THE DATE PALM, PHŒNIX DACTYLIFERA.

with the produce of the cocoa-nut tree. Houses may be built of its trunk, and thatched with its leaves. Matting can be made of its husk, and beds can be stuffed with it. The rope which supports the hammock of him who sleeps, can be made from it; or the rope that suspends the wretched suicide, who in a moment finds the sleep of death, steal on him like an assassin's gripe.

The Cocoa nut furnishes a favourite oil, when fresh excellent for cooking in the kitchen. But when stale it is promoted to the parlour, as an ingredient in composite candles.

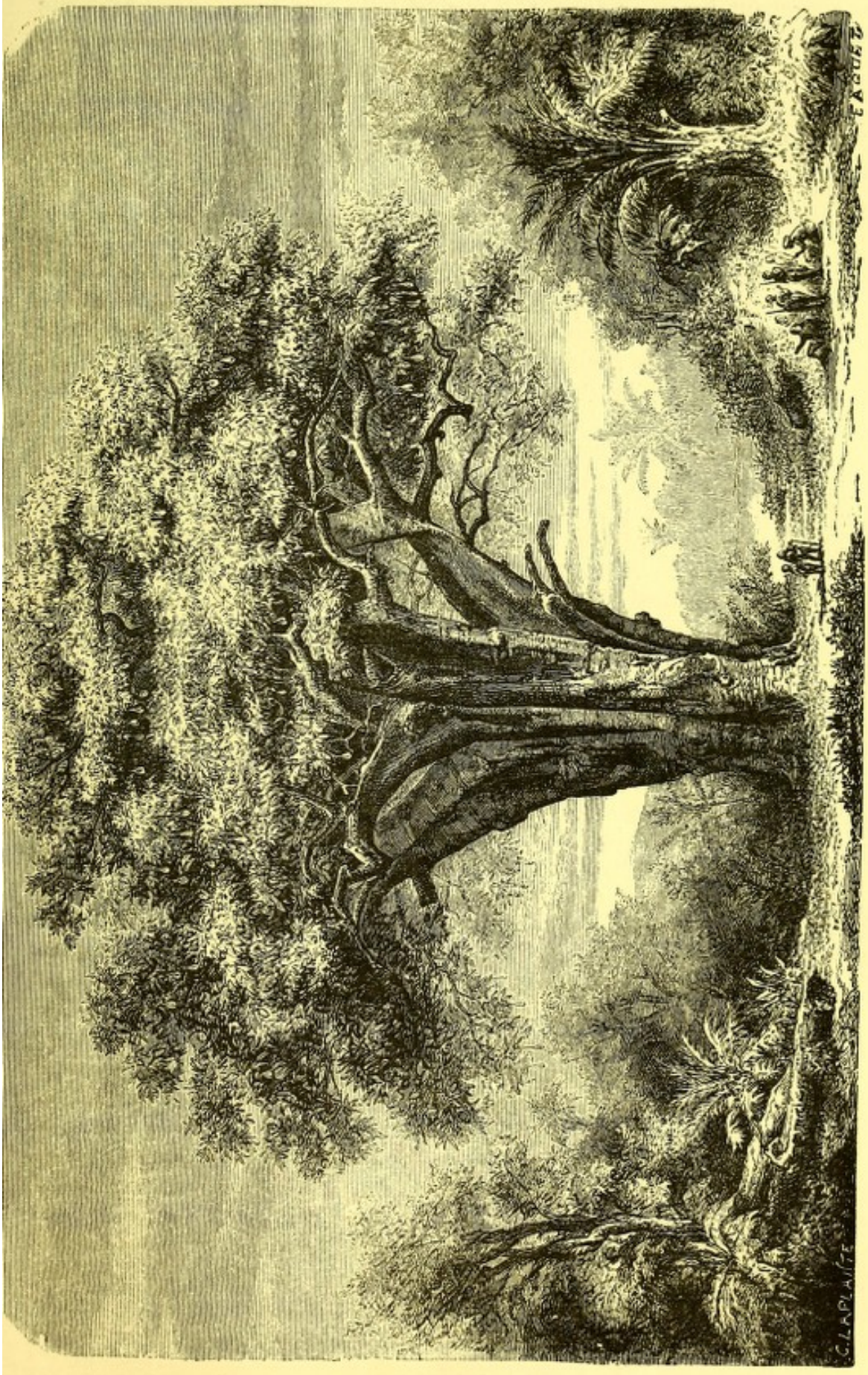
The trees may be tapped, or the unopened flowers made into toddy. When fresh this is a pleasant drink, but when allowed to stand it ferments, and becomes an intoxicating liquor; which may be distilled into the pernicious arrack, an evil spirit surely; the result of the cruel treatment of poor toddy. The best gifts of Providence when turned the wrong way, become the greatest curses. The finest geniuses when deranged, become the greatest wrecks.

The cocoa nuts are protected by a tough skin, a close network of fibre, and a thick hard shell, exceeding that of nearly every other nut in hardness and thickness. So precious a kernel, with the milk which feeds it in its infant state, is deserving of this extra care from mother nature. It is treated altogether as a baby. There is the smooth little overall; the fibrous jacket; and lastly the stiff bandage which keeps the tender little substance together. It is rocked securely in its high cradle, by its kind friend the wind. And soothed to slumbers by the distant lullabies of the waves. When it is ripe, it falls from its cradle; casts off its outer garments, and founds a genealogical tree for itself.

Trees and plants are the emblems of life; a country without them appears dead and utterly without hope. But they vary much in their degree of liveliness and cheerfulness, some wearing a funereal aspect as if weeping over the dead, but still living in green life, nourished as it were by their ashes, and pointing as the sap rises with the return of spring, to resurrection.

All plants remind us of *life*, *death*, and *resurrection*. But some do it in a melancholy, and others in a cheerful manner. The trees that shed their leaves, remind us of man who loses his life and regains it. While the evergreens, remind us of moral beings *without* mortal bodies—who do not *die*, and who do not teach us the same cheering lessons of PROGRESS.

Great trees illustrate nations, ages, and empires; particularly with reference to their continuance or longevity. The elm, horse-chestnut and poplar, are quite trees of modern times, and



THE BAOBAB, ADANSONIA GIGANTEA, FROM A PHOTOGRAPH.

represent by their ages, the period between this (1870) and the Reformation. The ivy carries us back a century earlier,—to "the wars of the Roses;" the larch to Bruce, and the humiliation of Edward the Second. The orange to the early date of the establishment of the Inquisition; while the old lime tree carries us back to the days of our Saxon Kings; and the oak to the period of the Romans. The yew to the time of the migrations of the Saxons and Scandinavians, and the Baobab to "the Flood."

These trees by the length of their lives, thus illustrate our great chronological periods. They decay and fall like Ages; some being the type of Ages and Nations; while others are coeval with the residence of Man on Earth. That is to say with the descendants of Noah.

We have we trust in our *typical* review of botany; drawn attention to the many illustrations of man and his characteristics deducible from plants. The science of the *culture of plants*, affords many emblems, of the physical and intellectual education of man. So also does the education or subjecting of animals to moral restraint, illustrate that of man's intellect and propensities, to his higher moral faculties.

Agriculture is the science of cultivating the earth, for the benefit of mankind. It has been divided into two departments, that of fields and of gardens. But the same principles of cultivation apply to both. The soil must be prepared, plants or seeds put therein, manure and medicine applied, and the same celestial blessings invoked. The difference between the two systems of planting, consists chiefly in agriculture being on a rougher and larger scale, for the production and growth of the Staple vegetables of life, or those most in demand in society. While horticulture raises those luxuries, delicacies and ornaments, which render life pleasant.

We consider the culture of the ground, illustrative of human education; agriculture being the type of physical education, on which the life and sustenance of the body depends. This claims a place before that of mental, which horticulture so well typifies; for nations cannot be intellectually great, unless they are physically strong. Bread is as necessary to the maintenance and support of the frame, as fruits of a more refreshing character, are grateful to the stomach and brain. We must cultivate both branches, if we would enjoy either much. The bread feeds and the fruit flavours; the neglect of either renders life unprofitable.

Adam was placed in a garden which he had only to dress and keep; he was not required to plant. But when he fell he required to plant — significant of the culture needed by his

descendants, if they are to produce fruit, and even live on earth. Soon Adam's position was changed; he required transplanting himself as well as his plants, and a new process of seed sowing in him, was as necessary as to the new Soil which he was sent to till.

Let us take up agriculture, and consider how far it illustrates physical education. In every description of planting, good *seed*, good *soil*, and good husbandry are necessary. In physical education, good stocks are required to found a healthy family; a good situation in life, and parents with good constitutions, who live in accordance with physiological laws. Lastly that development and culture of the functions of the physical frame, which can only proceed from SELF-EXERTION.

There has always been a vast difference in the natural qualities of soils; let us consider them for a moment, as illustrative of the position in which individuals are found.

The growth of plants as the growth of animals consists in the absorption by the germs of life, of certain disintegrating particles. This is a chymical operation, and is included in vital chymistry.

The culture of Animals is a higher branch of employment, than agriculture or even horticulture,—it is the type of Moral culture. And we see in the obedience of animals to Man, that they, consciously or not, are under the control of a being, subject to laws and regulations of a moral character. Man is the head and ruler in this earth; and in proportion as he acts up to his true position, so does he rise as an individual being.

CHAPTER V.

LOWER ANIMAL LIFE, TYPIFYING MAN.

DIATOMS — DESMIDACEÆ — GLOBE ANIMALCULES — POLYPS — MEDUSÆ — VENOMOUS CREATURES — ECHINODERMATA — ENTOZOA — ROTATORIA — ANNULATA — ARACHNIDA — ENTOMOSTRACA — CRUSTACEA — MOLLUSCA — INSECTS — BEETLES — BUGS — FLIES — BEES — WASPS — ICHNEUMON FLIES — RUBY FLY ANTS — SAW FLIES — MOTHS — BUTTERFLIES — NEUROPTERA — ORTHOPTERA — HOMOPTERA — PARASITES.

LARGE things are *not great*, they are small, and small things are *great*. It is *not* the whale and the elephant that build mountains ; that cover the sea shore with their skeletons ; that animate the dust of earth ; that inhabit the Arctic regions where no other form of organic life exists. Thousands of feet, down in the depths of the ocean, in all latitudes they live ; yet so minute are their proportions, that thousands can exist in a drop of water, to which such a small space is *a world*. How vast are the possessions of these innumerable worlds, over which these creatures reign ; but their lives are short. The panorama of life, presents them in the form of globes, eels, worms, snakes, stars, flasks, drinking cups, funnels, fans and fruits. They start into life, and enter at once on an existence of incessant motion. Some find their birth in the entrails of mountains, which to our view could never have seen the light of day. They perform all their functions there, and pass away, leaving their skeletons behind perhaps to form the foundations of pyramids.

Millions of skeletons, exist in a single cubic inch of stone, and perhaps are ground to polish the precious lenses of the optician ; or to give to his steel or brass work, the lustre of light,—the power of reflecting lustrous light. They are like the *pioneers of progress* who often feel not its *blessings*, yet play their parts and pass away, that higher beings may shine forth from amidst their dust.

These creatures principally move by means of *cilia* (minute hairs) which likewise clothe the delicate internal and external organs of the higher animals. But although they play an analogous part in their economy, yet they are more emphatic-

ally the organs of lower animals. And thus in type, we see that although the lowest organs are indispensable to man, yet he should give the highest place, to his highest organs; and he will suffer much if he neglects this.

Poison or galvanism, applied to these minute creatures, while it *kills*, yet does not immediately stop the motion of their cilia, which continue to vibrate for some hours after dissolution. In harmony with a class of organs, which are low in function, even when carried to the highest animals.

The term of life of these minute creatures, varies from a few hours to as many weeks. But until they have played their parts this term of life can be suspended for an indefinite period (according to Leuwenhock and Professor Owen). Embalmed in a grain of dust they for years lie as if dead, even where light, air, and the temperature suited to organic life exist. But give them moisture, and they start into active life, fulfil their course and die. Man's present life is short, long he sleeps in his tomb, perhaps a hundred, or a thousand times the length of his Life. But when the "spirit of life" touches him, he will rise.

These creatures can be alternately restored to a life of activity, and returned to their *dry death;* or the period of their suspended animation. A type of those, who living by themselves, are seldom invigorated with that refreshing influence so needful to a true enjoyment of life.

Infusoria are typical of all classes in the Animal Kingdom, and their analogues the Desmidaceæ amongst vegetables, are equally the representatives of the highest classes to which they belong. How is this to be reconciled with the distinct and progressive Creations, that have brought the different links of a vast chain of organisms into being? Only by this great Fact being acknowledged. That Man the highest organism, is the type of the lowest. And surely he was once a monad, or almost a monad; as was first rendered clear by Leuwenhock. (Phil. Trans., 1678.) This is the first source of being of every animal above the Medusæ. The transformations man undergoes from his conception until his birth aptly illustrate the Great Divisions of the Animal Kingdom. This is the true view of Progressive Creation, for which Lamarck substitutes Progressive Development. His ingenious theory if not correct in fact, is so in type.

The globe animalcules (*Volvox globator*, Linn.) in form, remind us of the fecund germ. Little balls are encrusted with smaller globes, which in turn become greater. These minute creatures, are therefore founders of colonies; and as they *develop*, the parent bursts. The great principle that a renewal or increase

of life, is accompanied by, if not the cause of death, thus pervades the lowest class. Death follows as a necessary sequence on increase, and is a requisite for maintaining the balance in a mutually supporting population. These fecund germs, contain within themselves, the seeds of dissolution, which their after development, renders more clear to us. They shine forth as they burst, the Founders of Life, the seeds of progress, the food of fish, the food of man, and the scavengers of the waters. They are the representatives of healthy increase—the type of the happy and well arranged social scheme, which in itself contributes to purify the "MORAL WORLD."

The phosphorescence (*Peridinum tripos*, Ehrenb.) which illumines the waves, causes them as they roll like glassy cylinders to glow with a pale pure liquid light. This is the great light of the ocean coming from itself, and is a type of those, who are the means of opening up new knowledge or understanding of "the mighty deep," proceeding from its bosom. They are like the intelligent mariner, who gets his light from the sea itself. But to this very light the sun of heaven contributes, by developing these minute organisms where they lie.

The Bastard Polyps (*Vorticellina* &c.) present an analogy with the molluscs, and are often of a bell shape; they are furnished with Cilia which some of the lowest animals have not. They are like those higher animals who use their arms in driving food into the body for their support as Cilia by constant motion direct the current of water into the mouth in which minute particles are floating. Even as the man, who endeavours to turn the "current of public opinion" towards himself by the motion of his moustache, or the Cilia of his eyes.

The Stentors are naked Hydras, capable of altering their shape, from an egg to that of a serpent; and when at rest assume that of a trumpet. All classes of creatures have their many sided representatives. Some without transformations, show extraordinary flexibility and adaptability; such as snakes amongst reptiles, and their representatives—the diplomatists. First appear the egg and incubus, secondly the serpent which makes its own way, and does the work of the three conditions; lastly the trumpet form, typical of exaltation and success.

The Polyps must be of the highest significance as a type. Their jelly or living portion, like the fleshy parts of man decays, and the bones or skeleton remains. Their skeletons go down throughout all time: in the seas of the present age; in the strata of the past; a type of the bony skeleton of man. On the bones of men great empires are founded. On the skeletons of what was once a clothed Polyp, a living coral, an Islet rises from the ocean's breast. And soon the noddy, the booby,

LOWER FORMS OF LIFE FROM NATURE.

Fungia agariciformis.

Branching coral.
Fire frog.
Argonauta argo.
Pholas dactylus.
Pecten opercularis.
Malleus vulgaris.

Millepede.
Scorpion
Common frog.
Edible frog.
Donax.
Spondylus.
P. opercularis

Mollucca crab.
Purple emperor butterfly.
Locusta migratoria
Death's head moth.
Arca Noæ.
Chiton squamosus.
Cassis.
Mactra.

Spurge hawk moth.
Solen.
Anomia ephippium.
Mitra episcopalis.

and the luxuriant palm, flutter and wave on the new domain, founded on the ruin and death of millions. These all, having played their parts, expire and leave room for higher forms of life.

Some nations possess a Hydra like tenacity of life, they may be cut in every possible manner, and yet each section forms the nucleus of a new nation; small perhaps, but still performing all the functions of a distinct and separate nationality. Such were the Jews; cut and divided in every possible manner, yet each fragment was representative of the nation, and became such in all lands. Thus the nation is unextirpable, having all the vitality, flexibility and grasping power of the Hydras, in which they exceed all other animals, as the Jew perhaps does all other nationalities.

The Tubular Polyps (*Tubularia*, L.) are a curious class, showing analogy to the Amphitrita among Annulata. They are of a tree like form, the animals living at the top of the tube, and casting out their tentacles like the feathery leaves at the summit of a palm tree. They appear to possess a circulating system, analogous to that of such plants as the Chara. This circulation, does not altogether depend on *cilia*, as in some of the lower animals. They have also some resemblance to Serpula amongst Mollusca: thus constituting an important link amongst classes. (See Johnston's Brit. Zoophytes.) The Tubular Polyps, which possess a circulation higher than is general among their class, may be compared with the man, who circulates more than he can rightly call his own; who distributes the property of others, as if it belonged to himself.

The "dead men's toes" (*Alcyonium*, Pallas) have a sufficiently significant name, for in these animals of the Polyp class, death is typified by life.

Sponges (*Halcyonina*, Hoeven) are highly important in commerce, their very softness and flexibility give them a preference over their more stony kindred the corals; yet the stony ones though brittle are alone suitable as foundations. The sponge is a type of what is soft, absorbent and impressible; of the kind of mind and brain, that can apparently take in a great deal, but cannot retain: soon becoming dry, and liable by pressure, to be turned into any shape or form. These men have their use. They are commonly inclined to spread over a considerable surface, yet have little solidity unless like the frozen sponge they are under powerful influences; they then attain a gravity not their own. But only lay hold of them with a warm hand, and they soften helplessly in your grasp, absorbing your intemperate heat at the same time. The sponge absorbs much

liquid, hence it is used to take up what cannot be got at in any other way. Thus the expression "sponging house," is used to imply the house of temporary detention in which bailiffs deposit debtors, who by yielding to the demand made upon them may escape from the present pressure.

Various articles in common use amongst men are well illustrated in this order. Thus we have the sea fan (*Gorgona flabellum*), which resembles a cabbage blade; the sea pen (*Pennatula phorporea*); and the umbrella polyp (*Umbellularia*, Lam.) as well as the organ coral (*Tubifera musica*, Lam.), the tubes of which are like the pipes of the organ.

In the *Madrepora*, *Seriatopora* and *Millepora*, we see the analogues in stone of the soft sponges, once inhabited by living polyps. The sea mushrooms, or mushroom corals (*Fungina*, Lam.) show a wonderfully close resemblance to the mushrooms of our heaths and woods. Like them when old they can stand alone; but while young, love the parent stem, showing thus a forcible likeness to our own species.

Sea anemones (*Actinia*) like the Hydra, can turn inside out and receive no injury; and can reproduce perfect individuals from sections. They are viviparous, hatching their young from eggs within the body, and bringing them forth by the mouth. Their lovely colours, shape and markings, remind us of exotic composite flowers. They are ravenous as feeders, consuming what the Hydra would reject; but as they hatch their eggs themselves, they are much in advance of that class. Their name "Actinia," implies a high degree of sensitiveness to the sun's rays.

If the Hydra be a type of the Jewish nationality, these are a type of the Teutons, being more marine in their habits, more prettily coloured in complexion, less scrupulous in diet, and inclined to hatch their own offspring or colonies. The tentacles of the Actinia, have analogy at once to the vegetable world, and to the mixed independent and dependent character of Teutonic society, in which all hang on *one stem*, yet mostly work on their own account.

The sea nettles (*Acalephæ*) and *Medusæ* a jelly like division of the animal kingdom, are higher in organization than those classes which preceded them; some even displaying the rudiments of a nervous system. They move however, only by the expansion and contraction of their blubber like bodies. When incautiously handled many species excite a stinging sensation, similar to that which our common nettle produces; and from an analogous cause. For the minute hairs with which the surface of the skin of this animal is covered, show a resemblance to the poisonous hairs of the nettle plant.

In some of these *Medusæ* we see analogy to men of a low class; who like these creatures are not quite the lowest of their kind, for they have sufficient intelligence to do great mischief. The lowest of all are too lethargic to irritate or injure actively. These venomous persons are like the Medusæ, dangerous *to handle;* but with all their biting and stinging properties which excite our dread; they can never command our respect, as they are wanting in that noble simplicity which may show sternness, but not venom.

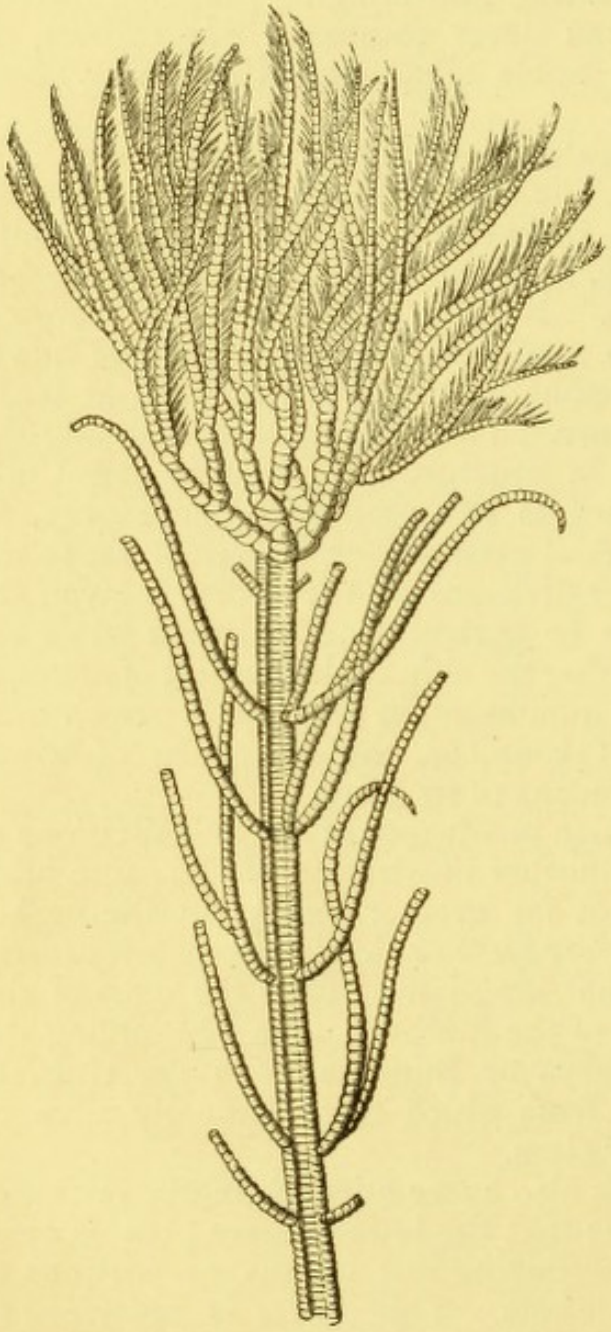
Only low classes of creatures, or the lower members of a high class are venomous. The higher mammals are not *venomous;* only such as the skunk, the weasel and the Ornithorhynchus. The sharks or higher fishes, and among the reptiles the higher lizards, are not venomous. Neither is the boa the grandest among serpents. And so amongst the Amphibia, the newts and toads which are poisonous to the lower animals at least, are beneath frogs in structure. The stinging insects among the Hymenoptera are beneath in structure the non-venomous Coleoptera; although their sting is not used to procure prey, so much as in self-defence. And even among Lepidoptera, to the Bombyces, one of the lower divisions of the order, is given the principal place of scourges to agriculture; and their larvæ are sometimes capable of irritating the skin of the highest of animals, to the extent of producing inflammation and death. Such does the *Bombyx processionis* of Linnæus, the caterpillar of which causes great irritation by means of its hairs.

In this class, which is much in advance of the first divisions of animal organisms, we see another illustration of the same principle, which is carried to a far greater extent in the higher animals—that the stages *before birth* or early existence, represent lower divisions of the animal kingdom. Thus the eggs of the Medusæ, quit the saccules of the mother, much resembling the Ciliated Infusoria, Leucophrys or Bursaria, (Van der Hoeven, Eng. Trans. vol. i. p. 100), from which they gradually advance to the perfect type of their class.

It is important to remark also as we advance in our review of the higher orders of nature; that the lower classes possess most perfectly the power of reproducing lost organs or portions of organs and of supplying defects. This power is possessed in the least degree by man. In this we only see a continuation of that analogy, which marks him in our world as the great centre of nature, aptly included in the word "Microcosm." And as we rise from the savage to the philosopher or from the meanest peasant to the prince, we see the same chain of analogy. That the lowest individuals of Our species, supply their wants most easily; and the highest have most difficulty in filling

up vacancies. The injury we experience from a fall, is generally in proportion to the height from which we fall.

With the sea bladders (*Physalialam*) though not standing first, we commence a great class, which is included in Radiata. These bladders are called "Portuguese men of war" on account of the colours they present — exquisite lilac and blue, reminding us of the bright colouring of foreign vessels. The crest these creatures exhibit, resembles faintly a vessel with a large lug sail spread. These sea bladders have little solidity, and are in fact mere bags of water. A large individual weighing when living 30 or 40 lbs. shrinks to a small bulk when dry, and only weighs a few ounces. These Portuguese men of war, are dangerous to handle, on account of the inflammation, excited by an acrid secretion with which they are furnished.



PENTACRINUS CAPUT MEDUSÆ.

The term "Portuguese man of war," as applied to this creature, sounds like a nickname, such as might be given by our sailors in derision of the Naval forces of a nation, which displayed little courage in proportion to swelling pretensions. Yet these very sailors, when in the *power* of a Portuguese man of war, might be made to suffer a punishment, which would be severe, when contrasted with the former contempt in which these enemies were held.

The Echinodermata or great class, including the sea urchins, sea lilies, star fishes, and the sea cucumbers, form with the In-

fusoria and Polyps, the great division Radiata. The *stars* of the waters, take forms as various as were ever given to the constellations of the Heavens, by the most fertile imaginations of astronomers. The Echinodermata show a great rise on the lower divisions treated above; but still have great power of reproducing lost parts, suitable to a low class. The "paradise of these low forms of life," appears to be the East Indian seas.

The principal and most beautiful divisions of this class are extinct, or nearly so; for their Age is passing away. Although we still see the rare *Pentacrinus caput medusæ;* the sea lily of the present West Indian seas,—the last species of an extensive division, of which ten or more examples crumble in museums.

"A single rose is shedding there,
Its lonely lustre meek and pale;
It looks as planted by Despair,
So white, so faint, the slightest gale
Would whirl the leaves on high."

The star fish (*Asteriæ*), vary in size, number of arms and texture. They bend their arms and creep along the sand or stones, for their food consists of the small Mollusca they find at the bottom of the sea. They may be taken as fairly representative of the class Radiata. Many of the species secrete an acrid fluid, which vesicates the human skin, and acts as a poison when taken into the stomach.

Unlike the "sea eggs" which have such bulky bodies, these creatures have hardly any body, being mostly developed in the arms. When we consider their size, we must admit that they are weak, helpless and insignificant; like most creatures of other classes, whose limbs are greatly disproportionate to the bulk of the body; unless they possess some extra provision, in an eminently powerful muscular system.

The sea urchins (*Echinidæ*) are covered with stony spines over a hard shelly coating, and are provided with very formidable jaws, the teeth of which are tipped with enamel. Their shells consist of plates united to each other, of a five or six sided figure. They cannot swim, but creep along the bottom of the water. Their food according to Valentine is principally seaweed, but they also eat Mollusca.

These hedgehogs of the deep, are typical of those soft flabby individuals in human society, who would soon be destroyed were they not protected, by the usages of civilized life. The "sea eggs" must fulfil an important place in the economy of Nature, or means like this would not be taken for their protection. First the stony shell and then a covering of spines, that they may more frequently resist the attacks of their enemies. Orders of less importance, or which are more prolific, do not require these extraordinary aids.

Those creatures which are found in the greatest variety of situations, and are gifted with the greatest degree of fecundity as species, require less armour to protect them, for their ubiquity prevents their extinction; their enemies cannot attack them everywhere at once. Animals that are from their numbers or extensive distribution difficult to extirpate, usually perform specially important offices in Nature.

The sea eggs need a double covering of protecting armour, being sought after as food by man, and a vast variety of the greater fishes. An analogy carried to the higher animals. The oysters and cockles so much prized as food, have hard shells. The ant-bear, the pangolin, the armadillo, the turtle and tortoise, and the eggs of birds and of many reptiles, mask their rich flavoured contribution to the food of the world under a thick skin or shelly covering. In the vegetable kingdom also, we see a like protection afforded by the rind or shell of fruits and nuts, to the choice aliment within.

The sea cucumbers (*Holothuriæ*) are named in accordance with the considerable resemblance they present in form to those delicacies amongst vegetables. They are wholesome and nourishing articles of diet, being dried and smoked by the Chinese and Malays under the name of *trepang* (*Holothuria edulis*) which they use for thickening their soup. They have very little appearance of animation or power of motion, being "as cool as cucumbers." Which proverbial expression is founded on the analogy between that cool vegetable, and those exceptional individuals, who scarcely ever get warm under any treatment, unless they are "*put in a stew.*"

The worms (*Entozoa*) that exist in our bodies while we yet live, that crawl, climb, or suck their way from our brain to our feet through every part of our system; are types of that universal state of degradation into which man has fallen. These creatures devour us before we have become the legitimate food of worms. They are a type of *living death.* Those who are free from internal parasites, are typical of *the Regenerate,* who have cast out internal sin. The sin of "the regenerate," or external sin, is illustrated by those creatures that cling to man's skin as long as he lives.

Entozoa are not confined to man, but pervade the internal organs of Mollusca, fishes, reptiles, birds and mammals.

Intestinal worms (*Caryophyllæus,* Gmel.) are a heterogeneous class made up of divers forms which can hardly be otherwise arranged. They go through many transformations, adapting themselves to their different locations in animals, and show an indestructibility almost like that of the Hydra. They can exist under very different circumstances, living in the lungs of some;

the brains, stomachs, intestines, and especially the liver, of others. Such parasites are difficult to extirpate. In this we see an analogy to sin, which is taken up in a worse form by contact with those in whom the moral disease has made more progress than on ourselves. "Evil communications corrupt good manners." Although perhaps no person is utterly free from parasites, still there are some species more virulent and noxious than others ; just as there are degrees of flagrancy in crime.

Fish are infested by tape worms, which in the stomachs of the water-fowl that live on fish, take a higher form.* What is a little sin in a small person, is a great sin in a great person, the enormity being a good deal in proportion to the status of the guilty party.

The Cystic worms do not possess a mouth, and are therefore obliged to receive their nutriment through their skin. When present in man's body, they may illustrate innate sin ; not the sin that he acquires by contact with other sinners, but of that which absorbing his own substance, reduces him to a low level of degradation. When his brain is infested by worms, it is rendered incapable of its healthy functions, and causes the individual to be unsteady in his walk like a "sturdy" sheep.

Tape worms which some writers consider merely the early stage of the cystics, are flat like a band or girdle, and are found in the intestines of man and animals.

The wheel animalcules (*Rotatoria*) were formerly included in the Infusoria, and are manifestly higher but more complicated in organization, approaching according to Nitzsch, the structure of the Crustacea. They have been well termed "wheel animalcules," as they consist of a number of circles revolving within each other. The motion of the *cilia* of some species, causes an optical illusion, giving the revolving circle the appearance of a toothed wheel, like that of a watch. The proverb "a wheel within a wheel," is here forcibly illustrated ; and thousands of these wheels may be contained in a drop of water, which is carrying the illustration still further. Their sexes are apart, and they multiply in a manner, analogous to that of the higher Insecta and Vertebrata. Showing that members of a low class, can approach a higher, which indicates the progressive elevation of low forms. How different is the degeneracy or fall from a high class as seen in the frogs, whose generation is little above that of the lower fishes, or the still lower animals without a backbone at all, being even below that of most insects.

The Amphitrite (*A. magnifica*) is justly named magnificent, and is the king of its class, resembling a sunflower or Chinese umbrella on a flexible stalk or peduncle, showing the same

* *Ligula simplicissima* in fishes, becoming *L. sparsa* in birds. See Von Siebold.

resemblance expanded or contracted. It is not attached to the tube in which it lives, but can withdraw from it. It is a native of the seas in the neighbourhood of Jamaica.

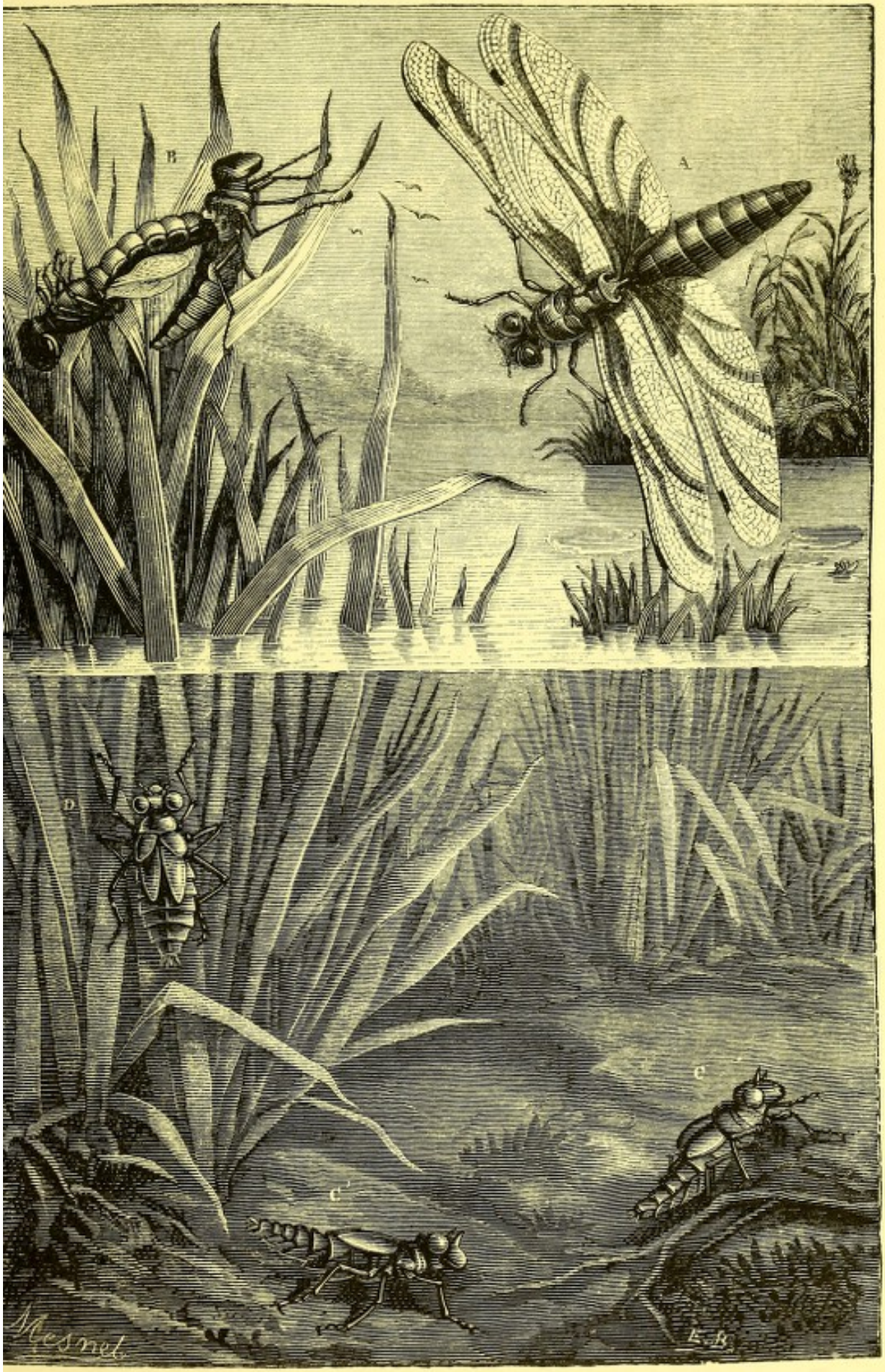
It is generally in the tropics, and on the shores of lands rich in spices and luxuriant exotic Fauna, that we see "the paradise of low forms of life." The Amphitrite typifies by its extraordinary envelope a special nursery for the cultivation of what is gorgeous and magnificent, yet morally low. Here man has done little to elevate himself or develop the resources of these regions in proportion to their extent. The Amphitrites on account of their protecting tube, are less injured by the molluscs and the fishes of their native seas, than their more naked allies.

The Serpula have been degraded from their position amongst Mollusca. These remarkable animals, encrust the shells of other creatures with the calcareous tubes in which they live. British species are small, but those of Peru, Chili and Patagonia are of a monstrous size: another link in the harmony between low human and animal forms inhabiting special regions of the earth.

The Annulose animals that possess antennæ, burrow in the sea-shore; and are sought as a bait for the fishermen. The *Arenicola piscatorium* is very common on our sandy shores; it has 13 pairs of gills. We turn our worms to good account, in using them to catch higher animals for our food; but they are smaller than those of other countries, and in a low and more insignificant place. These worms are typical of degraded classes amongst human beings. In tropical countries a great degradation of morals, prevails in high places, which contrasts unfavourably with the state of things in our country. This, the bait of the fisherman illustrates. Our degraded human fellow subjects, are not generally allowed to occupy important positions.

The sea mouse (*Halithæa aculeata*), is decorated with the hues of the Rainbow, and is our most beautiful member of this class, being common in the seas of Britain. A type of the most elevated members of low classes among ourselves. "*Man is but a worm*," and yet can rise in proportion as he reflects the light of heaven, to a brilliant position in the status given to him.

The creatures which breathe by means of *slits* as do the centipedes, spring tails and many parasites, have been placed by Lamarck in a class called *Arachnida*. They are not much in repute except as loathsome objects; some being merely detested and avoided, while others are dreaded. Their habits however, render them among the most curious members of the animal kingdom. Their organization is simple, but very efficient.



TRANSFORMATIONS OF THE DRAGON FLY, LIBELLULA DEPRESSA.

Perfect insect. B, Perfect insect emerging from the pupa. C, D, Larvæ and pupæ. (See page 149.)

The cheese mite (*Acarus domesticus*), meal mite (*A. farinæ*), and the sugar mite (*A. sacchari*) do much injury to our stores. The necessaries of life living or dead, have their peculiar enemies which lessen their value, and are types of that "food for the mind," which is infected by a *loathsome* taint. Some depraved appetites prefer such food, like the eaters of *mity* cheese.

The pseudo-scorpions, are allies of the venomous scorpions, but are without tails; and though eager to attack, have not the power to injure large animals, that the true scorpions have. They may be compared with that man, whose "*bark* is worse than his bite."*

The Arachnida are small in our country, but in the tropics they reach an enormous size, equal to that of the largest insects, and the smallest birds, fishes and reptiles. They have little to recommend them in character. They are treacherous, malignant and spiteful; and when desperate, the scorpion has been said to commit suicide.

The scorpion is an enemy to great and small creatures. It resembles those satirists who live to torture others, but contrive to torture themselves most; and at last may fall into that wretched state described by Lord Byron.

"The mind that broods o'er guilty woes,
Is like the scorpion girt by fire,
In circle, narrowing as it glows,
And maddening in its ire;
One sad and sole relief she knows,
The sting she nourished for her foes,
Which never—never yet was vain,
Gives but one pang and cures all pain,
And darts into her desperate brain."

Spiders are by far the most numerous of Arachnida. By the clever traps they lay for insects, and by their cunning ways, they show analogy to some of the criminal classes in large cities, who live on those they catch; and who from their dark spider-like dens, watch the helpless entanglement of the weak, until they are completely in their power. They have so little sympathy for each other, that the stronger sell the weaker's blood, when no other prey is within their reach.

Some spiders (*Mygale cæmentaria*, Latr.) construct a nest of earth with an ingenious valve, like the lid of a snuff-box. A suitable castle for the "Giant Despair" of the smaller insects; into which it can carry its prey when ready to be devoured. Spiders even at the breeding season, have no affection for each other. When they approach to propagate, the stronger female often devours the weaker male, who tries to get out of her way

* Sir W. Scott's Monkbarns.

as soon as possible;—an instance of ferocity only paralleled amongst wolves, or the fabled Amazons. Other spiders form no webs, but jump on their prey like tigers.

The bite of the tarantula (*Lycosa tarantula*) is said to be followed by a dancing madness curable by music. When persons were possessed by a spirit of prophecy, they were seized with frenzy or ecstasy, which was soothed by music—like the bite of this spider.

The Crustacea are a class of animals, having a hard shell but no skeleton, and are higher in rank than insects as they breathe through gills; yet they are lower in other respects, as their power of restoring lost limbs is much greater. The head of the Crustacea is the limulus (*Polyphemus gigas*, Lam.) which possesses a spear-like tail with which it attacks those who handle it. So monstrous a giant, could only find an appropriate home on the coast of the Moluccas or the Oriental Archipelago where so many atrocities are committed.

The *Cyclops vulgaris* belongs to the important division Entomostraca, and has been much studied by the naturalist on account of its wonderful structure and habits. It varies in colour with the soil beneath the water in which it lives, and possesses a single eye, which has caused it to be named after the classic giant. Very few animals have a single eye. To the ordinary observer two eyes are necessary; for they alone enable him to see an object in its right proportions and in its right place; they should both look towards the same point and become as one. Spiders have eight eyes; and are thus emblems of spiritual agencies who have extraordinary means of vision. This little Cyclops has but one, and that on the top of its head, and is a type of those who can only look upwards when they are in their right position.

The woodlice (*Oniscides*) are useful in eating up decayed vegetable matter; but by their action they contribute to this decay. Their value to society is similar to that of many professions and trades, that certainly do rid us of much refuse; but they make at the same time, a great mess themselves.

The soldier or hermit crab (*Pagurgus, Dald.*) has an intense love of the home it has taken possession of; fighting desperately in its defence. It is helpless when away from home, but can stand a formidable siege when it has its shell on its back.

The robber crab is a furious destroyer of the fruits of the cocoa-nut, and other palm trees. These crabs in a wonderful manner, tear away the thick covering of the cocoa-nut with their immensely powerful claws, until they reach one of the eye-holes. This they force in; and with a long and narrow

claw, extract the white kernel. They breathe through gills which they require to moisten with water. They remain on land during the day; but at night visit the sea. They construct deep burrows among the roots of trees, forming for themselves a comfortable bed of cocoa-nut husk. They are of an immense size and formidable in attack, but are excellent eating. The abdominal section yields fat, which when melted is sufficient to fill a quart bottle.

This creature was observed by Mr. Darwin in the Keeling Islands. These Islands have only the pig amongst European domestic quadrupeds—the lowest and most grovelling of them all. These pigs may illustrate the English settlers, and the monster crabs, the Malays who inhabit the Islands. Crabs are not usually emblematic of anything good. The crabs of the Moluccas are huge compared to ours, and illustrate monster vices, which are found generally to accompany, the greatest development of low forms of life.

The Mollusca as a class are suggestive of a certain stage in man's existence, the pulpy stage—when he is enclosed by a comparatively hard case.

The cuttle fish (*Sepia officinalis*) is one of the heads of the class, but has so little dignity that it changes colour like a naughty child when detected. And not content with this; endeavours to blacken whatever is near it.

The tender univalve mollusc, shrinks from the crustacean prowlers of the deep. In peace it expands its many-coloured arms and crawls from rock to rock. Its house is its fortress; once within it, the ferocious crabs storm at the door in vain. All the waves that tear the trees of ocean from their moorings, roll far above the unconcerned mollusc, which glides along its course and dies. Its fortress is its coffin, soon an empty one, vomited upon the beach—its only monument; but in the rocks of every country, every climate and every age an imperishable relic of its being.

Sensitive genius recoils from the scoffing crowd into the shell of self, and there feeds on what it has gathered from the outer world. Its influence is more permanent than that of the noisy mob without, for it leaves behind it an everlasting memento of its existence.

The terrestrial Mollusca, such as our common snails, are proverbially slow; but leave a track behind them, which the most brilliant insects often do not.

The oyster (*Ostrea edulis*) has no head. This is typical of man's dependence on a Higher Power. The oyster makes no effort, to move from the rock on which it is cast. It has a wide mouth, and is self-contained like the Dutchman, yielding

only when the knife is at its throat. It now and then produces a pearl; but never "a pearl of great price."

The pinna is fastened by a silken beard to the rock; and was said by the ancients to be attended by a little crab, which gave it a signal, to close its shell as danger approached. This resembles those monitors, whose presence is not pleasant but useful.

The Pholas and Teredos, suggest the greatest engineering feats; and what great deeds may be accomplished, by the judicious application of a feeble force.

In the shells of Mollusca, we see resemblances to every class of animals and plants. In their first state, when shed as spawn, they remind us of the ova of fishes or frogs. They are a type of the fleshy, pulpy individuals, who are slow in motion, and suited to low life.

The beauty and singularity of the shells of many of this class, have caused them to be objects of study to those, who are comparatively indifferent to Nature. Fancy or discrimination has given them names illustrating every class of objects, natural and artificial. From the mineral kingdom to high forms of life. From the razor, the trough and the wedge; to a wreath, an ear and a tooth. To the sailor, to Noah's Ark,—and to—Venus.

The class Conchifera or bivalve, is the lowest of the Mollusca; the class which contains almost the only true hermaphrodites. The univalve Mollusca, require in many cases the agency of two or more individuals, to perpetuate their species. But these conchiferous animals, are quite independent of each other's aid in propagation,—with some exceptions.

The higher we advance in the scale of creation, the more perfect is the separation of sex, until man is reached. Yet occasionally, we see in him an analogy to the hermaphrodites, the type of his greatest degradation. "In the beginning they were male and female." One of the greatest beauties of a high class of life, consists in the separation of sex. The sexual feeling being most perfect in the highest class of minds, is dependent on the innate constitution of these individual minds, which must exist as long as mind and consciousness. Why should we unsex ourselves, and become half a species? The mind of each is so constituted, as to cultivate extremes of qualities, that the species as a whole may greatly progress. This explains sex, and constitutes its permanent distinction; not the mere requisites for propagation.

The Terebratula is a genus nearly extinct; but it was formerly one of the leading divisions, of the shell-bearing animals of our seas. In shape they remind us of the beaks of birds, or of the cuttle fish somewhat distorted, and show the analogy that con-

nects them with a higher class. The more we study organisms, the more we are convinced that the lowest are connected with lower members of a higher class; either by actual resemblance, or by analogy.

The antique lamp (*Anomia ephippium*, Linn.) shows a faint likeness in shape, to the *Lucerna* of the Ancients; being but another proof of the repetition by man, of the forms of natural objects, which he modifies to suit his own convenience. One species of this genus (*Terebratula cranium*, Linn.) shows a resemblance to a skull cut open, while another (*Placuna*) is so transparent, that its valves are used for window glass, in China.

The thorny oyster (*Spondylus*) by its rude, rugged, heavy structure, and rich colouring, shows much resemblance, to the somewhat grotesque, but elaborately carved furniture, made of fine tropical woods. Such has been much in fashion. Chinese porcelain, was no doubt greatly suggested, by shells of this and other classes. The Pecten or "Venus' comb," suggests that necessary article of the toilet, as the Spondyli do the brush; and the hammer oyster (*Malleus vulgaris*, Lam.) those implements of the carpenter, the hammer, and the T-shaped ruler.

The pearl oyster (*Avicula margaritiferus*) produces the famous pearls of the East; which reach their maximum of beauty in the Persian Gulf. The lining of the shell of all pearly molluscs, deposited on a grain of sand or extraneous substance, becomes in time a brilliant calculus. The smallest atom may thus in a proper situation become the foundation of what is great and beautiful. The most painful diseases, (for the pearl is nothing more than a disease) assume the most brilliant and magnificent appearance.

The pearl's delicate hue, that silvery whiteness with a tinge of gold, fresh and clear, yet rich, is the complexion of a lovely girl (Margarita). But like her, it needs the lustre of other gems. The coral of the sea for the lips, and the delicate carmine seaweed, to cast its veined branches over her cheeks. With eyes of varying lustre, deep blue, reflecting hues of ocean, and a clearer, brighter blue; when with contracting pupil, the bright light of Heaven streams on her face. She is a pearl of the waters. Persia's coasts may produce pearls, but not pearls like this. And for the honour of fair Scotland, England, Wales and Ireland, it must be said that they produce *these fairest pearls*. The deep beds of Highland lochs or slow-running rivers, yield the purest pearls, from *Unio margaritiferus*.

The mussels (*Mytilus edulis*) of our common rivers, to some persons are wholesome and nutritious food; to others poisonous: and most powerfully exemplify, that what is good for one, is

not for all. Everything has its place, and *nothing* is originally poisonous in Nature, *unless corruptly used.* Every object is detergent upon some other object; and our great poisons are often our greatest antiseptics.

The mussel, is one of those shells that under a rough, crude epidermis, hides a beautiful hue of a rich, dark, indigo-blue, inclining to violet. The brightest hues of many are also under the surface. Man's blood is of a rich purple, or a bright red, in proportion as it is oxygenated; and the colour of his muscles and internal organs, is brighter than that of his skin. The skin of the most perfect men is nearly white, that it may include all colours; this very outside, contains the elements of the brighter tints below.

Arca Noæ, has been so named from the fancied shape of the vessel that formed the bridge that connects us with the Antediluvian world.

> "Across whose trembling planks our fancies stride,
> Into the realms of mystery and night."

The ship worm or *Teredo,* like the small insects on land, accomplishes more than the greatest monsters amongst its class. It is incessant in its labours, boring night and day, reducing the stoutest timber, exposed to its attacks, to a crumbling honeycomb. The little bivalve shells advance through the wood, never turn back, and there they die. The puniest efforts multiplied many fold, make up great results. The smallest profits, are consistent with the largest business, and generally accompany it.

The *Clio borealis,* is one of the principal articles of food of the northern whale (*Balæna mysticetus*). These creatures the size of a line in length, possess thousands of minute suckers, for catching their prey; showing that the smallest individuals, have the greatest facility in laying hold of, and catching what is small. An analogy which applies also to man, in the tenacity with which little men seize, and retain what they desire.

The glass nautilus (*Carinaria vitrea*) is curiously constructed, for the shell covers only a very small portion of the body, just where the heart and branchiæ are situated. The shell is in the form of a little cup, and has a singular appearance. It is a type of those savage tribes, who cover but little of their nakedness. Such are easily attacked by mosquitoes, as these molluscs, are by the minute crabs of the ocean.

The vast sea,—a type of the earth, is probably peopled by high intelligences. (See Rev. v. 13.) It is a mirror of human life. Lively, sparkling, seldom still; its waves perform labours as numerous as those of Hercules; they fill the water with gases from the air; they crest the tide of wealth and health

which ebbs and flows towards the shore; for by their aid the fruits of opposite quarters of the world meet. An account of the living myriads of the sea would fill many a library; they are analogous to those of the land in their mutual dependence, their lives and their propagation. The motions of the sea, like human passions do not always storm, but live until that glassy bay is reached where all is calm, and life itself stands still.

The Chitons are clothed with a shield of plates, analogous to that of the woodlouse or the tortoise; while the limpets (*Patella*) resemble the knee-cap, or a cap for the head (*Pileopsis*). Some even like hats in modern use, have a little aperture for ventilation (*Fissurella* and *Emarginula*, Lam.).

The Chitons are typical of plate armour, used to protect the tender body, or of the ships built in links to yield with every motion of the waves; and yet capable of being made rigid at pleasure. The power they have of coiling themselves into a ball, they possess in common with woodlice, and their analogues the lower Insectivorous and Edentate mammals. These last are types of unthrifty human beings, who may descend with the loss of their teeth, to a lower class in society, than that to which they properly belong.

There are pyramids (*Pyramidella*) among shells, as well as mitres (*Mitra*), tops (*Trochus*), turbans (*Turbo*), turrets (*Turritella*) and helmets (*Cassis*). The terrestrial molluscs, are mostly small in our climate and in northern Europe. They are a type of what is slow, flabby, indolent, and unintelligent in human life. In South America, Ceylon, and the Isles of Sunda, they attain a great development. In Africa where they are still more gigantic, they are largely used as food. They are usually more dull coloured, than the marine Mollusca; but some display as brilliant tints as any; except those metallic, or pearly hues, which sometimes decorate the marine shells of the tropics. The porcellaneous and highly polished surfaces, are also more common in sea, than in land shells.

The *Limnæa* or mud snail, in some instances requires the assistance of three or four individuals, for the multiplication of their species; while others can perpetuate their kind unaided.

These are a type of those degraded races and individuals who are polyandrous in habits. They descend lower, than do the higher members of the molluscan class, which preserve distinctions of sex.

The CEPHALOPODA have distinct sexes, and have in some cases internal shells, allied to the backbones of a higher order. They thus stand at the head of molluscs, and include the king of shells, the pearly; and the queen, the paper nautili (*Argonauta argo*). The shells of the pearly nautilus (*N. pompilius*)

are chambered: an immense advance in organization, over the inferior divisions of the class. They are so graceful in form, so elegant and pearly, when the rough epidermis is removed, that few objects in nature exceed them in beauty. Many shells likewise, are dull coloured and rough in their natural state but when polished are brilliant to the eye. These should be studied in both states; while the whole beauty of others lies on the surface. The least touch of the polishing tool mars their fine lustre.

"Which is when unadorned adorned the most."

A mollusc may thus be ornamented with colours rich and glowing, which are invisible to man until after its death.

The reputation of a saint, a hero or philanthropist attains its greatest lustre when his life is passed, for like the substance of these shells, by reflecting the light of heaven in all its iridescence, it is a fit ornament for every age.

These Nautili, inhabit only the last chamber of their shells; the others being reserved, to be filled with water by their syphon, when they desire to sink. This mechanical appliance is used by this low class, as well as by man, who like the nautilus lives in his last chamber—where the last events of his life occur. He cannot go back into the past; he must go onward. In proportion to the length of his life; it may be in great events or it may be in years, so is his attainment.

The cephalopodes are for the most part extinct. The Ammonites and the Belemnites, were amongst the most highly developed Mollusca; the great age of which is past, but an age in which the higher animals predominate, has come.

It appears to be a leading principle in progressive creation that throughout all the great ages, Representatives of the great classes should exist. Yet the standard of life, rises with progressive ages; but Genera which belong more especially to certain ages become extinct.

INSECTS.

One of the characteristics of the present day according to Mr. Phillimore, is the increasing interest devoted to *Entomology* or to the studying of things from an entomological point of view: making much of little things, or dwelling long on what is of trivial importance. That this may be done sometimes in the present age, as in every other, is a statement in which most persons would agree. But if we survey entomology, we find that it is a *great* and not a "little" science. Man may extirpate the elephant, perhaps the whale, certainly the moa, the great

auk, the larger reptiles and large land vertebrata generally. But Cæsar, Napoleon, or a nation powerful beyond all precedent, might shrink from a task, which would exhaust ineffectually their most strenuous efforts: they could not conquer the insect hosts.

The *bashikoui* ants of equatorial Africa, if we may believe Du Chaillu, drive before them the elephant, the lion, the gorilla and man. The great armies of God, are not lions, leopards, or the vulture tribe; although all these play their parts; but "the countless locust;" the greatest scourge to society in the animal world. This has its prototype in the hordes of Tartary, which in the middle ages "swept like a pestilential breath from their Steppes, to stifle the tenderest long cherished blossoms of art."

The beetles, so generally distributed, are scientifically called Coleoptera. They stand at the head of insects as the most perfect of their class, and many species shine brilliantly. The variety of hue and form in this order, far exceed those of any other division of insects or of the animal creation. The collector of beetles, like the collector of anecdotes, preserves many for their beauty of colouring, and others for their grotesque character. Beetles illustrate many trades. There is the wood-boring beetle,* the burying beetle which undertakes interments, the scavenger beetle, and the numerous mining beetles, for wherever man goes the beetle goes. Man's actions are thus specially illustrated in the world of beetles, which are the longest lived among insects.

The book worm (*Atropus*)—the larva of a beetle, is a type of those collectors of facts and patient students, who bore deep into the recesses of literature, to prepare the way for writers of a higher order. The book worm comes first, then the beetle. The book worm works harder than the beetle. Some persons say the beetle does not work at all. Does he not live in a light which would kill the book worm? and does he not provide for a future age? The larva of this beetle works greatly in the dark; but in its perfect state the insect does not dread the light. In like manner collectors of facts, or "bookworms," form windows often in the dark to admit light upon literature.

There is the ivory beetle that bores in ivory. Another species bores through lead. There is the bacon-eater (*Dermestes lardarius*) among beetles, the grave burrowing beetles, the beetle that infests our museums (*Anobium puniceum*), particularly the entomological cabinets.

The water beetles are our masters in the art of progression under water, for they possess marvellous powers of swimming and diving. They move with great rapidity in the water, and

* Such for example as "the death watch," *Anobium tessellatum.*

are the ducks of the insect world. Like our own aquatic population, they are not at home, except on, or in the water.

The bugs or hemipterous insects are inveterate suckers of the juices of animals or plants; they grow heavy as others grow light. In the United States almost every insect goes by the name of "bug"; those that are very noisy are termed "Humbugs."

> "Come let me flap this *bug* with gilded wings,
> This painted child of dirt, that stinks and stings."—POPE.

The flies or DIPTERA are not liked, but yet generally distributed. They make little provision for the future, enjoying the present moment only, as they do not often hybernate. A large portion of them make a great noise, and mess and spatter every thing they touch. Idly they buzz during the summer weather, over all the works of their neighbours; enter their chambers, leave the marks of their feet wherever they go, and carry about with them the odour of the graveyard or the dust heap. The same brilliant sun reflected in the tint of the emerald, the *ocellus* of the peacock; or the brilliant hues of a higher insect life, sometimes gilds the exterior of these flies. We fancy we see one now, its body is shot green, blue and gold; and round its head is a diadem of rubies. We see it alight on the putrefying corpse—The Imperial Musca Cæsar. When rottenness and corruption reigned in the Republic of Rome, and the conscript fathers were exiled from the putrefying state, and the morals and the coinage were prostituted for the benefit of the few, Julius Cæsar stamped his image on the decaying Roman "As" in place of the galley of free Rome. See him for a moment wrapped in his gorgeous robe, ascend the stairs of the Senate House! He turns his back on Pompey's statue!—he is gone. "*Musca Cæsar*" was a glorious insect compared with the "grubs" that proceed from him:—Julius Cæsar was a Noble Roman, when contrasted with the "maggots" his successors.

We have met with human individuals who resemble these flies in character; for one lived not far off. He always dined at his neighbour's expense when he could. He abounded in false jewelry, and all that could set off an insignificant person, devoted to the excesses of life. He affected every thing that was brilliant, and despised every thing that was solid, but made a great noise in his little circle, "more by clatter than wit." He showed a want of order and regularity; he never had clean hands, and never wiped his shoes. His visits were erratic, but he generally came for the day; and from his blue coat and love

of rare vintages, was at last nicknamed *Blue Bottle.* As long as he lived with his uncle, the sun shone on "Blue Bottle." The ladies excused his dirty feet, and nearly kissed the hands of the heir of Old Bottle. But when "Old Bottle" died bankrupt the winter came on "Blue Bottle," and he was broken never to hold wine again.—*The broken bottle goes to "the wall."*

"Daddy longlegs" (*Cteniphora pectenicornis*) did great injury to vegetation, particularly to the gooseberry bushes and other fruit-trees in his juvenile, or larva days. But now his legs are too long and his motions are too uncertain to do much steady mischief, yet he is already the parent of offspring which will show a strong family likeness to his juvenility. He is a type of a member of society that one sometimes meets with, long necked, long bodied and long legged. His coat is ever open and blowing in the wind, like the two wings of this fly. His grotesque motions render him an object of ridicule, and he is perpetually "spitted" by those who criticise entomologically.

The gnat (*Culex pipiens*) is another "creature of a day" which is a great pest to the higher animals. In the early stages it passes much of its time in the water, which it assists in purifying. When in the winged state, by their great numbers they may sometimes obscure the sunbeams. The gnat may be compared with some writers in daily newspapers, who are capable of biting homeopathically, but whose bites occasion a short-lived inconvenience,—an irritation but for a day. The writers in newspapers are said greatly to contribute "to the purification of the moral atmosphere," but by their numbers they like a cloud of gnats, may sometimes cast a shade of obscurity on the horizon.

The horse-fly (*Tabanus*) delights in sucking blood, and few animals can succesfully drive it away; hence many of the larger quadrupeds like to roll in the mud to render themselves impervious to its attacks. The philanthropist is also frequently obliged to plaster up himself and his purse to avoid being "bled" by a vagrant and hungry population. (*See page* 145.)

The humble bees (*Bombus*) so called on account of the loud noise they make, exhibit three sexes, and perform great feats. Individuality and combination with them are coincident, and they delight in labour. Unlike some of the insects of their order, they exert *themselves* to obtain food for themselves and their posterity, from the common field, by daily industry. They never rob the nests of their own or of other species. Each works hard, and like those men who do the same, and are provident, methodical and indefatigable, they enjoy wealth, and leave behind them substance sufficient for another generation. But the last generation of humble bees being born late in the autumn, has less power of saving for its posterity, than those

generations born in the summer. And so a few surviving females from a nest of humble bees, are the parents of colonies the following spring; like the last of a race of human beings, who has to begin the foundation of a new family. The cuckoo bee (*Apathus memorum*) is a hanger-on of the humble bee, doubtless useful to it as a dweller in its tent, as the Japhetic race is said to do in that of Shem. The researches of science are still insufficient to account for the connexion of races; and the precise relation to each other of the humble and "cuckoo bees."

The honey bee (*Apis mellifica*) carries method further than the humble bee; as the constructor of hexagonal vessels, it teaches man the most perfect method known of packing liquids, cubes being unsuitably angular and liable to fall to pieces. The hive has been the type in all ages of a thriving industrious community. The working bees are said to kill the drones or perfect males when they are too numerous, or are no longer needed. In which they show analogy to the Amazons whose husbands were killed when they did not want them; as described by Justin and Diodorus. Bees being governed by their Queens, are certainly a type of female monarchies. The high order of instinct possessed by the bees, and exemplified in the management of a hive where the female sex has the predominance, throws great honour thereon. A well ordered hive, illustrates the British form of government; which is as far in advance of the male monarchies of the Continent, as the honey bees's hive is before the home of some other divisions of the hymenopterous order. Female government among insects is exceptional, and is only useful amongst creatures consisting of three or more divisions in their society; typical of our Queen, Lords and Commons. The drones cannot be done without in the government; but on the working bees and Commons, depend the supplies.

China is a hive incessantly occupied; she copies with marvellous regularity what she has done before, with a precision unknown in higher races. They acknowledge so far as we know, but one head in general; yet the overcrowding of the Chinese hive has of late years developed a tendency to swarm, and a refusal to submit to the head of the hive. What the pressure of stronger nations from without may effect, remains to be proved. Were the inhabitants of the Chinese Hive to be reconciled, they would have no difficulty in stinging any invader to death, particularly the "Russian Bear."

The genus *Vespa* is an extraordinary one, displaying much yellow and other bright colours. They are very ingenious, and are our instructors in *papier mâché*. This paper is formed prin-

cipally of the bark of trees, and where they can get it they are fond of the bark of the mulberry, with which they build their curious habitations. They are omnivorous; honey, flesh, living or dead, the tiny insect, the expiring giant, can be pinched alike by their mandibles. As we approach, they show signs of hostility, and occasionally sting when we come too near. They are the analogues of the inhabitants of Japan, who teach us so many new applications of paper, which is so much used in their dwellings. But they are so treacherous and spiteful that it is difficult to keep on good terms with them, and we sometimes feel inclined to smoke them out, as we do the wasps, with the flowers of sulphur, charcoal and nitre.

The hornet is a large insect of the wasp family, but is not nearly so numerous as some of the smaller wasps, yet it is much more powerful and more dreaded. They are insensate and inveterate in their attacks, plundering as they roam. If the bees and wasps are types of the Chinese and Japanese, the wandering hornets may represent the Malay race, their allies, who are of a more roaming disposition. Hornets are stronger than wasps, and the Malays are more powerful individually than either of their more civilized brethren of the Mongolic race. Their depredations also are more conspicuous where they are in force. The hornet has his place as a scourge of nations; as a means of extirpating those appointed to destruction. A few millions of hornets would be formidable indeed. These Hornets once drove out the "Hivites," to clear a land flowing with milk and honey. (Ex. xxiii. 28.)

The ichneumons are a large order of four-winged flies, which prey upon the bodies of living insects. Some species with their long and sharp ovipositors, pierce the skin of living caterpillars, and lay their eggs in the body of the animal. These eggs hatch and yield minute grubs, which are sustained on the substance of the caterpillar: it grows lean as they grow fat. It is ravenous, but its food being put into a bad skin, does not nourish it as a healthy animal. At last it crawls to some sheltered spot, where if not too far gone it cracks its skin and discloses its chrysalis, from which a perfect butterfly can never rise. It may preserve its form till spring, but if broken, little cocoons of silk are seen within it, out of which arise small four-winged flies; pretty in themselves, but not the expected butterfly. Many of the brightest flowers are blasted by nipping frosts, so that they never bear the fruit they promised. A man of genius cut off by follies or circumstances, may never reach the starting-point he looked for from this world. He never can produce or execute what he had planned; or what is suited to the character of his mind; or what is worthy of the fine qualities

he possesses. He may be infested by some artful parasite, who understands his weak points, and knows how to turn his strength to his *own* advantage; and how to reap the reward of his labours, and through them go down to posterity, without perhaps leaving him the skin—the shadow of fame.

The ruby fly (*Chrysis ignita*) glows like a winged gem, reflecting the purest glories of Iris, azure, gold and the brightest carmine—a celestial combination,—the lights of the insect day. Their form, their colour, their rapid motion, cause them to be considered the most exquisite objects in the insect world. They are parasitic in the wild bees' nests. They ornament flowers, like the humming birds of the tropics; and like them flit away and are lost to sight in a moment. Our joys are often like a sight of this insect; brilliant, shining, commanding our whole hearts, and our imagination gilds them with all the glories of an evening sky. The blue of heaven then takes a purple cast, and the yellow light but enlivens the green vegetation. We warm at the sight, and all our language cannot paint our emotion. Such are the colours of a landscape illuminated by the setting sun—a brilliancy that cannot last, "the throbs and throes of an expiring day." The insect is gone—*our glow is chilled* by the dews of evening, and we awake from a delightful vision.

The ants are numerous, powerful, and show more intelligence than any family of insects. Incessantly they labour for the accomplishment of their ends. They have more power of accommodating themselves to circumstances than bees or wasps. Rills of water do not stop them. If the soil be soft they make a tunnel underneath the stream to pass through; if the soil be hard they make a bridge across the stream. Not deterred like brave men by the loss of a part of their number, they apparently consecrate their lives for the common good; knowing that their bodies form stepping-stones to another land. When they are in fear of being swamped by an inundation, some kinds dam up their nests to keep out water, and in one case, a species built a wall of mud, partly round some millet seed left by the receding tide, apparently as a preserve for their nest not far off. They are the most orderly, brotherly, active, strong and diligent of insects, eminently co-operative and democratic: they must have self-government. They are particularly clean, and fond of their offspring, which they tend with the greatest care. When they once lay hold, they do not easily let go. They have numerous domestic animals; beetles or scavengers and *cocci* and *aphides*, which have been compared to dairy cows.

They are often rich in stores of provisions. We consider them a type of the Dutch nation.

The wood ants are a large species, but being in smaller communities than other ants, they accomplish less. They are huge feeders and till lately were the great makers of formic acid. Ants are pre-eminently ingenious, and are apostles of industry and thrift to all mankind. These smaller communities of ants, have their nests plundered by birds; such as the domestic fowl, which is glad to feast on their eggs. This shows analogy with the small German states whose territories have been curtailed by the French—the "Gallic cock."

Slavery finds its analogy in the habits of *Formica rufescens* and *F. sanguinea*,—according to Pierre Huber. The first appears to be unable to exist without the aid of slaves of allied species. Its males and females are entirely devoted to propagation, while the workers are wholly employed in slave hunting; for they cannot make or repair their nests or feed their larvæ. When the increase of the inhabitants of the nest demands a migration, the faithful slaves may be seen dragging their masters to the new abode. The ruling populations of some tropical countries are almost equally dependent on subject races, who procure them food, and supply their various wants. Those ants which attend upon the ruling species are neuters,—analogues of the dark Eunuchs who serve in many Eastern households.

The sawflies are ingenious mechanical constructors, the tailors of the insect race.—They are very prolific. The caterpillars are especially beautiful and resemble those of moths. Other insects use a knife-edged instrument for cutting: these use a saw; a step in advance, like that by which the savage workman passes to the civilized. The sawfly resembles the more scientific workman of Europe, as contrasted with the imitative workman of China; typified by the bee. The caterpillars, the principal workers; show an affinity to an order more generally admired—the butterflies and moths—or *Lepidoptera*.

The caterpillar of the little Tinea or clothes-moth, burrows in, and destroys what many most value. The clothes in which they wish to hide their nakedness, to cover the little that is in them; for ofttimes "the gayer the clothing the emptier the mind." It is part of a great analogy, that our "filthy rags" should be destroyed, as we ourselves are by worms; in order that being naked, we should be clothed with new garments. The Tortrices embalm themselves in leaves, the beauty of which they destroy, but which enclose the germs of a higher life; another argument for the lower, being made principally for the higher.

HORSES ATTACKED BY GADFLIES.

See page 140.

The *Noctuæ* the most truly nocturnal as a class, are more commonly dull coloured than most of the moths, and harmonize well with the gloominess of night. Some genera are most brilliant in colouring, and wonderful to relate, have *metallic* Greek and Hebrew letters on their wings. This dusky genus of moths, that fly principally during the night, illustrate "the dark ages." And the families (*Plusia* and *Noctua*) ornamented with Greek and Hebrew letters on their wings, may represent the cultivation of these languages in the middle ages; which contributed so much to the enlightenment of individuals; and may be compared with the gold and silver characters which shone in the manuscripts, executed at this period of obscurity. The cultivation of these languages, and the illumination of works in them with gold and silver characters, were pursued amid the gloom of convents and monasteries. These slumbering embers of light, prepared the minds of men for the reception of the clearer daylight of truth.

The *Bombyces* are twilight moths; more robust in body and shorter in neck than the *Noctuæ*. They are brilliant in colour, many of the species being apparently attired for the *soirée*. The males are particularly susceptible of the charms of young females of their species wherever found, and are often caught in this way. In this they differ from moths of a colder nature. The presence of a young female, is sufficient in many cases, to induce them to enter a house which they never leave alive.

Some of the *Bombyces* prepare a silken canopy for themselves; a beauteous couch to be stained as the insect leaves it. This is of more value than any of the works of the insect, and serves to atone in the case of the caterpillar of the mulberry, for much destruction done to the leaves of the fruit-tree. As the producer of silk after its working state is over, it is the most precious of insects.

> "The good that men do lives *after them*,
> The evil is oft interred with their bones."

The humble silkworm illustrates a phase of man's life. Like the child, in its early stage, it does little else but eat, and only stops to change its skin or clothing. When it has eaten its fill, it longs to do something for posterity. Its silken covering, wrought with so much care and labour finds a place at court; among the streaming banners of victory; the pageant of holiday or the parade and mockery of mob law. It rustles through many a noble hall or church aisle; and its cracked voice, escapes from the electric machine. The caterpillar may well labour for such a reward; the man may well work with him for such wages; but the man alone can fully appreciate a compact;

he alone can sound the depths of the moral law. Viceroy of the Organic Kingdoms, he on behalf of his subjects pays wages and receives debts. The reward of works is various ; it may be immediate ; it may be deferred. It may blast from a trumpet ; it may be unobtrusive, perceived by few, but the giver and receiver ; it may benefit the individual or his posterity. Such a reward should satisfy the hard-working man, who perhaps spins all day in a dull corner ; he is not working for himself alone, he is contributing his quota to the market of labour, and sooner or later it will be rated at its value. With the eye of faith or imagination, he sees his work done ; the fruit that springs from it, and in the happy dreams of the tired labourer clasps the reward.

We do not often consider how man is as dependent on the lower as on the higher forms of life ; how the well-being of nations hangs on the fauna and flora of their habitations ; how the balance in Nature sustains the human frame. Begin with insects ; they demand a sustenance as justly as the higher mammalia. Insects as they flit from flower to flower carry that fertilizing dust, without which many a blossom, a bright new birth, a fragrant atom, would die and leave no seed. The world cannot bear unchecked vegetation. Man the chief gardener claims the choicest fruits ; monkeys and birds come next ; but ere "the debt of Nature is paid," the smallest insect, a day labourer in the paradise of plants must have its hire.

The sphinges justly called the hawk moths, are grand and soaring Lepidoptera. Poised over flowers with vibrating wings, they with their trunks, extract the honeyed sweets "on chaliced fount that lies." Although their wings are smaller than those of some members of their order, they are the most powerful in flight, and forcibly prove that depth of wing is not strength, but momentum is power. Excepting the humming-bird moth, and the "clear-wings," they avoid the noonday sun. Early in the morning we may see them suspended, on wings that vibrate like a flash of lightning over a bed of petunias, like "the coffin of Mohammed between earth and heaven," apparently without leaning to either. Breathlessly does the naturalist watch them for the few moments that they remain in view. They are gone. Whither ? To the flowers that saw their birth ; to the dark and gloomy recesses of the ivy ; perhaps to be the prey of the bat or the owl, or to remain until the day is past, and another hour of activity arises.

The death's-head moth (*Acherontia atropos*) shows how wonderfully man's structure is illustrated in some departments of Nature, and how life and death are intermingled.

Flying into the windows, the superstitious say, its shrill squeak "is the presage of plague, war and death."

The Polyommatus or blue butterflies, by their different tints of colour, show a resemblance to the various aspects of the sky, according to season and weather. The azure-blue (*P. argiolus*) is like the clear morning without clouds. The Clifden blue (*P. adonis*) is of the brightest and most glorious hue of noon. The large blue (*P. arion*) is of the gray of an autumn eve; and the mazarine blue (*P. acis*) is like the colour indicative of thunder. An exotic species is of a purple colour marked with rufous, like those clouds that,

> "Streaked with dusky red portend,
> The day shall have a stormy end."

The copper butterflies are magnificent insects in colour, and by their bright lustre, show an affinity to metals, without containing any portion of them. This appearance without reality, these wings which shine like leaves of gold, so lustrous, yet so short-lived; glorious like gems and yet having none of their enduring qualities, are not the less beautiful while they last.

> "The same superior rays
> Blush in the rose and in the diamond blaze.
> We prize the stronger effort of His power,
> And justly set the gem above the flower."

This brilliancy, this glory given to the insect, is an earnest to man of a more solid future, when the brightness of the surface shall be united to the substance of the cube, contained within the centre of the Eternal Circle. The higher we advance towards the more perfect butterflies, the more the analogy widens and deepens.

Some caterpillars feed on the lowly rush, the vernal grasses, or the lofty oak. Thus various in habits of life, in social position, when they sleep they appear in different coffins. Some are in a plain-coloured case without a spot of shining metal; while others in their death are ornamented with the gold, the silver, the copper and the iron of the age. The preciousness of the metal with which they are embossed, is not always in proportion to the brilliancy of the hues of the perfect insect. Those that are the plainest in their chrysalis state, may be adorned with gold in resurrection.

While we survey with pleasure and profit, the transformations of insects, particularly butterflies, as a passage from a lower to a higher life, we are reminded that the caterpillar stage is that for Working. *A lean* miserable caterpillar never becomes a fine insect. Its principal food is eaten in this *primitive* condition; the larger it grows, the larger it will be in the perfect state; the

more serene its latter days, the more glorious will be the bloom of its new life. Let the prophet of its birth, address to it the inspired words of Rogers.

"Child of the sun! pursue thy rapturous flight
Mingling with her thou lov'st in fields of light,
And where the flowers of Paradise unfold,
Quaff fragrant nectar from their cups of gold:
There shall thy wings, rich as an evening sky,
Expand and shut with silent extasy.
Yet wert thou once a worm; a thing that crept
On the bare earth; then wrought a tomb and slept.
And such is man; soon from his cell of clay,
To burst A SERAPH in the blaze of day."

The Neuroptera are not very powerful on the wing, if we except the dragon flies. Their wings are more transparent than those of butterflies, and they all prefer marshy, stagnant districts, where decaying vegetation is most abundant.

The caddis flies are curious in the larva state, working within cases to which they attach shells, pièces of stick and straw. These serve to hide and protect their tender bodies, from the attack of the perch and eel. They thus fortify themselves against their enemies; some species preferring stone armour and others wood. They are like the two schools of naval engineers; some of which give the preference to "wooden walls," and others to those of Stone.

The "lion of the Aphides" (*Hemerobius*, Linn.) has brilliant shining eyes, but such a foul smell, that although so very small and delicate it is loathsome. We see individuals of this description in large towns, small, thin and delicate, with sparkling eyes and a tinge of green about their complexions—the green of canker, not "the green of youth."

The dragon fly has eyes that shine like opals and wings more transparent and delicate than the finest tissue of man's art. It carries a formidable-looking pair of forceps at the end of its body. The eyes after death lose their lustre and the refulgent hues of the body are seen to lie beneath a transparent skin, upon a flesh that soon withers to a sombre hue.

When the former life of the dragon fly is inquired into, we find its eggs laid amongst the rotting weeds, in the stagnant pool that smells of sulphur, or the ditch as black as Styx. Its ravenous larvæ are kept in check by the "water devils" or larvæ of Dytiscus which often get possession of them. In the pupa state, they creep upon the reeds. The caterpillar of the butterfly becomes a glorious insect after its sleep, but the larva of the dragon fly, once the companion of "water devils," dwelling in the sulphurous stench of the marsh, in its resurrection may be compared with the RE-ANIMATED, but evil man.

The ant lion (*Myrmeleon formicaleo*) is an extraordinary insect. In its larva state it forms a pit in the soft shifting sand, from which it removes every stone or obstacle, that might prevent the fall of the sand on all sides towards the centre, at the least touch of an ant or small insect. It is sluggish in its motions, and at the bottom of its den partly buried in the sand, watches the approach of an ant. The little insect slips at the margin of the pit, perhaps struggles as it falls, and stopping half way down it receives a shower of sand from the ant lion at the bottom. The sand rolls down bringing the ant with it, which is seized by the lion; its veins are torn open and its juices are exhausted; it is then cast a shrivelled dry carcase out of the den.

Turcoman tribes watch in ambush the approach of travellers. Once in their clutches there is as little hope for the travellers or their property, as there is for the ant in the den of the ant lion.

The spider catches moths, flies and winged insects in its web. The ant lion catches insects without wings. They may both illustrate evil powers. The typical spider entraps the spirits of men: the metaphorical ant lion, his body and purse. Both these animals show untiring industry. The ant lions make their pit smooth on the surface, that the unwary may suspect nothing. Those men who feed on the substance of society, smooth the path of their victims to destruction.

The *Orthoptera* so important as scourges of the vegetable world, are amongst the most numerous as insects, thought not so great in variety of species.

The *Locusta migratoria*, common throughout the East, takes first rank as a destructor. As was said in the introduction to this chapter, it is the locust that is "God's great army, before which the land is said to be as the garden of Eden, but behind them is a desolate wilderness." Eating in all stages, they are most destructive in the larva state. They were before compared with the Mongol roving hordes and like them they are more devastating at an early stage of their history. When the locusts have wings, they may be induced to fly away from a neighbourhood, but when they have no wings they eat as they march: in this they show analogy with the mounted and dismounted Mongols.

The ravages of the Mongol are not yet for ever passed away. The "rose of Sharon" must be watered with Mongolic blood; as the oases of Persia and Arabia, are fertilized with the carcases of the locusts. (Ek. xxxix.)

The grasshoppers (*Gryllidæ*) are a light, merry, jaunty family of insects, singing throughout the summer; but dying in winter, they leave their eggs in the earth "in faith of a future spring."

These are like the seeds of our ideas, laid at first in cold ground which "the shining sun of hope" calls into life and further development. After all their various transformations, the grasshoppers bound among the green luxuriant leaves that cover the Earth.

The cricket is another merry insect particularly at night. We remember watching the field crickets at the entrance of their holes, waiting to devour any small ant, spider or beetle that came within their reach. These they seized and tore piecemeal, like beasts of prey, singing all the while. "Like men who could smile and murder when they smile."

The mole cricket (*Gryllotalpa vulgaris*) has a hand like that of the mole, which somewhat resembles man's. The power they have of digging in soft earth in search of small insects is marvellous. They dive deep into the earth in the daytime, and come abroad at night. They are ferocious insects and seek their prey in the lowest haunts, but fly at the least touch of the black coat of their persecutor the mole (*Talpa europæa*). These have their prototypes in thieves and police; the one showing great ingenuity in the commission of crime, the other in its detection.

The *Mantis religiosa* or praying cricket according to a writer of 1780, suggested "the attitude of prayer." But this attitude is nothing more than that of an insect of *prey*. They are exceedingly pugnacious, and are kept by the Chinese as other nations keep fighting cocks; the sharpness and power of their fore legs being extraordinary. They tear one another to pieces, fighting desperately until one is decapitated, and then the survivor devours it. The attitude of these insects, has suggested their name, but it is the order of battle, and should represent a war; nominally on account of religion, but in reality for gain. The worst passions are often roused, on a ground said to be religious; but *true* religion has as little to do with the controversy, as has the attitude of this insect, with what it is said to represent.

The walking leaves (*Phyllium*), are a curious connecting link between the animal and vegetable world. They, with the spectres (*Phasmidæ*), are the most wonderful of insects in appearance. They are doubtless formed and coloured like the plants among which they are placed, so as to deceive small animals and birds; as from their large size and helplessness they would probably easily be extirpated. An instance of the principle of compensation, which is always found to pervade every division of living organisms. Weak men are often fenced round with protecting armour; or their very insignificance causes them to escape notice. Others be it observed are protected by their

peculiarities, like the hedgehogs among mammals, or the toads among reptiles, while some, like the insect "walking leaves," are overlooked from a modest wish on their parts, to identify themselves with what surrounds them, yet like the insect, they may possess an innocent beauty, which "vegetates" as it were, near the place of its birth.

The cockroaches (*Blatta orientalis*) so disgusting to most Europeans in appearance and odour, are looked upon as exotics from the East. They eat ravenously in all stages. In the United States of America, they are more abundant than in this country, and occasion greater disgust. In the West Indies they are less obnoxious, being suited to the character of the climate. The Yankees would gladly get rid of them. "Cursed be the ships that inflicted these black beetles upon us" (say the New Englanders). "They came at the same time as the 'Irrepressible Nigger;' let them both go together."

The Homoptera, parasitic on our vegetation, are great pests among our small insects. The variety of species is great, and they are of many colours. Their excrement has a sweet taste, and contains much sugar; on this account their haunts are frequented by some species of ants. Such show an analogy with the labouring population in sugar-producing colonies, who are kept by European nations for the sake of the sugar they aid in procuring. They are black as Negroes; yellow as Chinamen; brown as Malays; or dusky as Coolies. Those who confine their sympathies to one race may dislike them, but these are often least willing to do without their sugar.

The parasites of the animal creation, are repulsive to most of us. The lowest animals are not free from them, and the *lowest* men most *abound* in them. Every animal has something to give away. The Mollusca have their attendant mites which at first come to feed on their *débris*. The moths, the butterflies, the bees, the beetles all have their *acari* or parasites. Fish, reptiles, birds, whales, quadrupeds and man, are all infested with a variety of creatures, which adhere to them in a most tenacious manner; some being furnished with little hooks on their feet, which renders them most difficult to shake off.

Many parasites that infest man, can exist away from him, perhaps all can, and are sent to warn him to use his knowledge of natural laws, by which he can make their situation untenable, so far as he is concerned. He should conquer in this manner his own evil desires and inclinations, so far as he has the power. The "water of life" has the same cleansing power over the moral man, that frequent ablutions have over the physical; driving away parasitic sin, even though it should cling with "hooked feet" till death.

The moths that float through the air at twilight and on "the green turf seek the honeyed flowers" are attended by a minute hexapod, which seeks the most downy recesses, where their wings join their bodies, to suck their juices.

These moths illustrate a dubious class of females who jostle passengers. The butterflies among Lepidoptera, have also their parasites, as have the "Butterflies of Fashion;" who however have no sympathy with the moths of the "*Demi monde.*"

We admire the character of the bees, more than that of the moths or butterflies, notwithstanding their frequently brilliant colouring, and the exquisite taste of their attire. Bees are not without their followers. Some of their own order are quite willing to live at the expense of the rest; such as *Apathus* and *Nomada*. Several flies (*Volucella*) also devour what the bees have prepared with so much labour. Large moths are glad to spoil the bees; and birds and quadrupeds prey largely on them and their industry. The minute insects that infest the bees, so rich in the spoils of vegetation, are often found on the flowers visited by them. These tiny parasites find an existence, easier in connexion with the bee than with the plant; but are capable of living on the plant alone.

The comforts of life, reward the industrious man; but those who are unwilling to exert themselves strenuously, to obtain a subsistence by industrial employment, sink into loathsome dependence. Pauperized by indolence; some subsist on the unwilling bounty of private individuals, while others feed on the resources—the very life-blood—of the State. These the State would gladly but *cannot always shake off:* yet we should always bear in mind that Human and animal parasites may, by the *judicious* arrangement of the classes on whom they feed, be induced to seek other forms of sustenance.

The Acari parasitic on beetles, are very prolific. They differ from those which are attached to bees, and accommodate themselves to the grosser habits of the beetles.

If beetles themselves have their analogues in various trades, so their parasites may represent the hangers-on of each trade, who subsist on the more industrious, and are burdens to them:—as the gleaners are on the farmers, the collector of shavings on the carpenters, and the marine store dealers on orderly households.

Birds are not free from parasites. From the "lordly eagle" to the swallow, the pigeon and the partridge, each has a species adapted to the genus. Those that "pierce the clouds," those that cleave the waves, and those which whistle on the hawthorn hedge; all illustrate life within life;—one form dependent on another;—the lower on the higher. These little creatures

ascend with the birds on their loftiest flights, and descend with them to the depths of the sea.

Quadrupeds abound in hexapods and ticks, which are their monitors to cleanliness and attention.

Man has his friendly tormentors, which "feelingly persuade him what he is." These he endeavours to get rid of, and he is thus relieved from much that his own ignorance has caused. The wise do not so much need advice, as those who from folly are unwilling to receive it. MONITORS ARE GOOD TO THOSE WHO NEED THEM, BUT IT IS A FAR HIGHER ATTAINMENT TO DO WELL WITHOUT THEM.

CHAPTER VI.

MORAL SIGNIFICANCE OF FISHES.

DOG-FISH—SHARKS—ANGEL-FISH—TORPEDO—SKATE—SWORD-FISH—GANOIDS—PIKE—PERCH—MULLET—GURNARD—STICKLEBACK—MACKEREL—TUNNY—JOHN-DORY—ANGLER—FLYING-FISH—PILOT-FISH—GUDGEON—TENCH—SALMONIDÆ—HERRINGS—COD—HADDOCK—FLAT FISH—REMORA—EEL—PIPE-FISH.

FISHES as a class appear to be typical of a stage in the life of Man as an individual, for before his birth he swims in liquid. They are also illustrative of the early history of some nations. The Teutons passed through various transformations. They adopted at first an aquatic mode of life, which we may call their *fishy state*. In a more advanced stage they were still maritime in habits, but their society was more highly organized. This is illustrated by the whales and seals, which are aquatic mammals—a far more advanced type than the fishes.

Water is life to the fish, as well as to the mariner who like the fish does not enjoy life long on land. The ocean is the home of the sailor, and while at a distance from it, he shows the strongest yearning towards rivers, lakes and ponds. Many a human inland population, notwithstanding its distance from the sea, still loves the water.

The spotted dog-fish (*Scyllium canicula*) is the most common species on our coasts, and deposits its eggs amongst seaweeds. The eggs are furnished with spiral tendrils at the four corners, which curl curiously round the seaweeds; by which the egg is retained in a safe position until the young animal is hatched. It is fortunate considering the voracity of this class, that they are produced in small numbers; only a few eggs being deposited at a time. The females are larger than the males amongst the sharks, as in birds of prey. These dog-fish swim in shoals, and attack most of the small fish, jumping after them in a bold and furious manner. The superiority in size and boldness of the female fish, suggests analogy with the "Fishwives" whose violence and impudence are proverbial.

The shark tribe is piratical in habits, and we cannot illustrate human sea robbers better, than by comparing them with sharks. The greatest number, most powerful, cruel and rapacious of these pirates, frequent other waters. But we have "petti-foggers" in our own seas, who rob the fisherman's crab-pots, and are frequently caught in the very act. They are justly punished by him for they spoil his nets. Such are however less serious than some of his other adversaries, who prey on the fish in the fry state.

The white shark (*Carcharias vulgaris*, Cuv.) is a rare visitor to our shores. According to Grew and other early writers, it was in former times more commonly found on the coast of Cornwall than on that of other parts of England. A type of the wreckers, who were more frequent on the Cornish shores than elsewhere. The shark is however a creature of tropical climates, being rare in temperate latitudes. Mariners have a greater dread of this species, than of any kind of marine animal.

The mouth of the shark opens very far below the nose; and the eye has a horrid expression. The teeth are sometimes two inches broad; and are set in six rows, one without another so as to be capable of instantly biting a body in two; or of swallowing a man whole. Every tooth of the shark has an *independent motion;* lying flat when at rest, but is erected at will for grasping its prey. The Pirates of the American seas are of this character. They obey a leader—analogous to the will of this creature, yet each preserves much independence. These are "white sharks" of the Semitic-European race, and are by far the most formidable of their class. They should be caught and slain without much mercy or exception.

The hook for a shark is usually baited with a piece of salt pork, a suitable bait for a creature of gross and savage appetite.

The blue shark (*Carcharias glaucus*, Cuv.) is another species that visits the Cornish and Devonshire coasts; committing great havoc amongst the nets of the fisherman, which it apparently delights in tearing with its teeth, and tangling so as completely to destroy the net; often however being caught itself. These sharks sometimes swallow the nets as well as spoil the fish of the fishermen; injuring them as effectually as those foreigners do; who plunder British fisheries, but are themselves at last caught by the Coast Guard.

The hammer-shark (*Zygæna malleus*) has an extraordinarily shaped head, and eyes on its two sides, which give it a most strange aspect. Amongst the sharks we see the representatives of different trades. There is the sawfish or carpenter. The hammer-shark, or blacksmith, and the fox-shark or thresher

(*Carcharias vulpes*, Flem.), which flaps or slaps the whale with its "caudal appendage."

The Greenland shark (*Scymnus borealis*, Flem.), is said to bore holes in the whale, as large as a man's head. This creature we will compare in our account of the Greenland whale to the numerous enemies that attack the English Constitution. They likewise have analogues in the pirates of the northern seas, which some hundred years ago preyed on commerce.

The sharks in the Oriental Archipelago and Pacific oceans are the most dreaded. Many lives, annually fall victims to their attacks. The West Indian pirates we compared with the white sharks, and we now see analogy to these sharks of the Polynesian and Chinese seas, in the Malay and Chinese pirates. These are sometimes called "white sharks," for they are lightish in colour, but of a different shape and contour from the *Carcharias vulgaris;* yet they are hardly less to be feared.

The angel-fish (*Squatina angelus*, Dumeril) is called by some the devil-fish, and by others the monk-fish. It is one of the ugliest of its class, and is held in much less esteem in England than it used to be. We question if it is not wholly unknown at our tables. It frequents the bottom, feeding on the flat fish. A habit characteristic of one of its godfathers the monks, who chose low rich lands for their dwelling-places, and fed on the little *souls*, and other "small fry" that fell in their way. The Turks treat this fish with more wisdom than we have done: they turn its skin into shagreen and use it for polishing. The monks formerly did some good in *smoothing the rough edges of society*. Those who are much opposed to their influence call them "Devils," while their admirers call them "Angels."—Let us call them "Monks."

The torpedo or electric ray is a rare visitor to our coast, but several species are commonly found on the Mediterranean and Atlantic coasts. They have been famous for giving electric shocks, even from the days of Dioscorides the physician of Antony and Cleopatra who thus early used electricity in medicine. Its extraordinary powers and structure, have been made the subject of numerous memoirs. The construction of the electric organs is analogous to that of the "Voltaic pile." The peculiar fluid secretion of the fish mentioned by authors, represents the diluted acid of the battery; as the electric organs of the creature do the positive and negative plates. It is a slow-swimming fish, and is said to keep at the bottom of shallow water, near the shore, and to kill or subdue its prey by a galvanic shock, before it is devoured. Those creatures that come in contact with it as it lies in shallow water,

receive "a discharge." This suggested the marine explosive bombs called torpedos, which are placed in the shallow approaches to a strong fortress, to destroy the bottoms of invading ships that touch them.

The habits of this fish, are suggestive of the use of engines, not calculated on by the superficial. They are like spiritual influences moving in the "sea of life," that are only likely to injure those going into "shallow water."

The long-nosed skate or shagreen ray (*Raia shagrinea*, Mont.) is amongst the commonest as well as the ugliest of fish. It is provided with curious crushing teeth analogous to the grinding rollers in machinery. It is voracious and ferocious in its attacks on small fry, and struggles desperately on the hook when caught, and the spines of the adult fish render them unpleasant to handle. They deposit eggs with four projecting beaks which are called "sea purses."

The skate is admitted in Normandy, as the type of a flat-faced woman. Those who fall in love with such an one, find if they catch her that they have hooked an "odd fish," who gives them much trouble, and is difficult to manage with ordinary means. A large skate may drag the captor overboard to the loss of his life. A powerful woman—a "typical skate," may drag her lover *into that sea where reason is drowned.* If he does succeed in landing such a "skate"—or such a woman, he finds her a "thornback" all his life. To be in the mouth or in the power of a large species of skate, is a very awkward and painful position, as bad as being in a shark's mouth.

The sword-fish (*Xiphias gladius*) has been famous from ancient times. It stabs furiously with its sword, whales many times its size; and even runs this weapon through the timbers of a ship, which it is supposed to mistake for a whale. The sword-fish has its analogue in those Navigators who from their boldness and desperate courage, attack with little deliberation, all they meet.

The ganoids were the characteristic fishes of an age which has passed away. A few species only, are at present known. This class which formerly contained so many species, is typical of nations who wore armour, and were more common formerly, than in our days. Those now living of this class of fishes, illustrate ships of war and peace; calculated by the mere strength of hull to resist attacks. The sturgeons especially, being stronger in their external covering than in their ribs, resemble many of the vessels of modern warfare, in having a less powerful framework than their outside plates. We ask what these *armour plates* on vessels are for?—and are answered to protect commerce from the attacks of enemies who would prey on it; as

the numerous voracious fishes would on the sturgeon, helpless without its armour.

The box-fishes (*Ostracion*) are incapable of moving rapidly, being enclosed in a coat of hard plates, nearly impenetrable to the attacks of ordinary fishes. Their tails and fins, are the only parts except the lips and eyes, not of the same rigid inflexible structure. They are fish in armour, and like the knights of old, awkward in movement. The American species (*Ostracion triqueter*), is reckoned the most choice fish for the table, of any found on the coasts.

These fish have their analogues in the turtles and armadillos. The turtles in particular shew analogy to the plated ships, which like them are cumbersome and awkward in their movement through the water. The sturgeons are like our "Warriors;" while the box-fish that are completely plated, are more analogous to "shield ships" of the American build, which are slow in motion and broad in beam.

The globe-fish (*Tetrodon*) is most singular and well worthy of the name of "Odd." It is covered with spines on its globe or cushion, a ball showing a resemblance to some species of cactus. The spines are sharp, and in one species they reach such size and sharpness, as to entitle it to the name of the "porcupine of the sea." These spines they can erect, showing a strong analogy with the hedgehog; and floating on the surface of the water inflate their large globe with air. No other fish ventures to attack them, so they return to their natural shape, and sink to the bottom. These are generally fishes of the tropics, but sometimes stray to our shores. They exemplify to us those seafaring men, who from their good nature would be stripped and plundered, did they not possess some external means of protection, from which their enemies shrink. If the porcupine is a type of the journalist of the land; this "sea porcupine" is that of "the press;" used in the protection of marine interests.

In our day the Ctenoid order, is much more extensive than the Ganoid. The pike (*Esox lucius*, Linn.) is a fish famous for its boldness and gluttony; eating ravenously and even attacking man, when pressed by hunger. It will sometimes bite animals that come to drink, with such ferocity, that it has allowed them to draw it out of the water, before it would let go its hold. The Pike is a type of the savage, greedy "middleman" or overseer. Like it he has perhaps an underhung jaw. He takes firm hold of his victim, and gets what he can out of him or her; nominally for his master's benefit.

These fish and their human types, were formerly much *esteemed* and were even thought necessary to the establish-

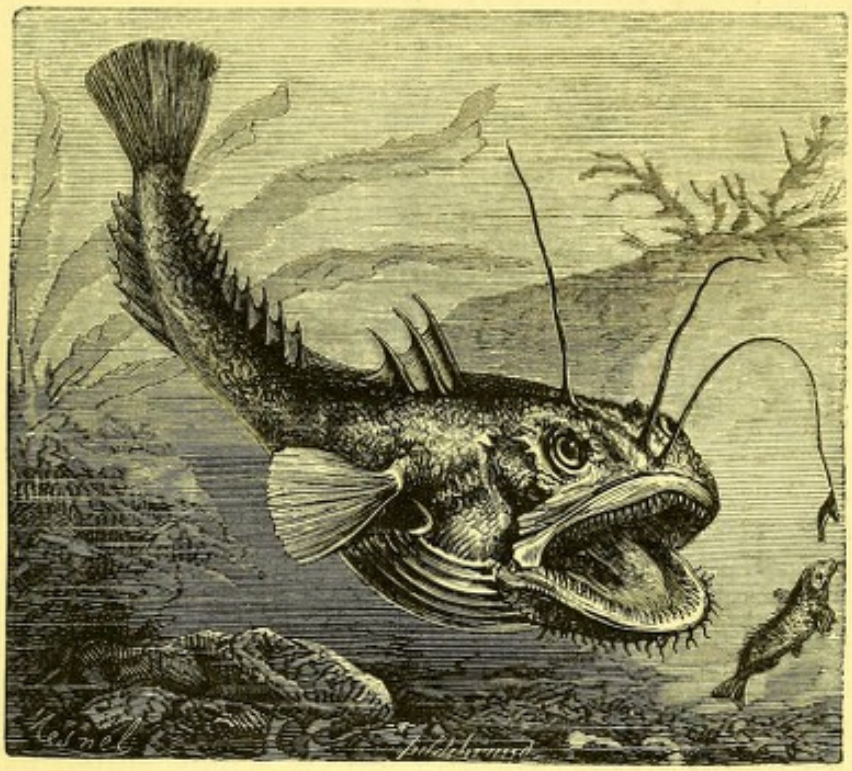
ment of every great proprietor. The pike was valued at double the price of "a house lamb" in February, in the days of Henry VIII. The "Messrs. Pike" were very fierce in those days, and are not quite extinct in our own. Pikes excite less attention now, from so many other fish being in request, of a less vicious character.

The perch (*Perca fluviatilis*, Linn.) was well known to the ancients, as also to the present inhabitants of almost every country in Europe, being found abundantly in most lakes, rivers and streams, throughout the northern and temperate parts. It is a bold biter of the young angler's bait, and easily accommodates itself to the smallest ponds. They are immensely prolific; yielding, according to Mr. Yarrell, 280,000 to the half-pound weight. The perch is a stout-bodied fish, and most brilliantly coloured.

It is fortunate that the finest races of human beings are the most fertile. Some families among the Semitic-European race are like the perch, pretty in complexion, but short and stout in figure, lively and "easily caught," yet by no means the highest or noblest of their order. The habit of sending out *Shoals*, is used in Gen. xlviii. 16 (*margin*) to illustrate the mode of increase of the children of Ephraim and Manasseh, who were to possess a fecundity analogous to that of fishes; which exceeds that of any other class of animals except insects, and still lower forms of life.

We see in the shark and fishes of its destructive class, scantiness of multiplication; and in the Ctenoid fishes the reverse. Usefulness is in proportion to abundance, and the contrary in these cases, although the cause does not exist here exactly *in prolificacy*. It is to the less prolific classes of animals, that we look for examples of *individuals* possessing the greatest amount of weight and influence. Human families that increase most rapidly, are not commonly so distinguished in their individual members, as those who increase more deliberately, and with more attention to consequences. But this is an *inner* type, and does not affect the truth of what was before said—That the highest races of man are the most *prolific*; and that the more useful fishes are the most *fertile*.

The great weaver (*Trachinus draco*) is famous for the severe scratches, it gives to any one carelessly handling it; and has been much dreaded for its supposed venom, both by ancient and modern fishermen.—It has however an excellent flavour. Even amongst fishes, there are poisonous and venomous species in all seas. Seamen of bad character "poison a ship's crew," inflicting injuries on all with whom they come in contact: and such are found wherever ships swim. Yet when kept under



THE FISHING-FROG. Page 164.

THE RED GURNARD. Page 162.

strict control and deprived of offensive weapons; may produce food for respectable members of society.

The red mullet (*Mullus surmuletus*, Linn.) was highly prized by the Romans, who thought that one of the greatest privileges of life, was eating mullet. It sold for an enormous sum when of a large size, being many times more valued than its weight in silver. It is a beautiful fish in appearance, and frequents the muddy parts of our sea-coasts. Its flavour is at once rich and delicate,—a combination not always procurable in food, either for body or mind. The flesh of the eel is coarse and strong; while that of the whiting, is delicate but tasteless. The mullet from the combined richness and delicacy of its flavour, typifies the work of a first-class author, which is a great treat to our intellectual palate. Such should not be devoured in too great quantity, lest it should be brought forth in an undigested state, instead of assimilated for the benefit of the mind of the individual. An Epicurean appetite for literary food should be cultivated, as it involves the rejection of compositions of a coarse and gross character.

The gurnard (*Trigla cuculus*, Linn.) is a big-headed fish short in the nose, and is said to utter a noise when taken out of the water, resembling that of a cuckoo. It is very abundant, and if well dressed is good for the table, but this requires considerable art. Its fins are large and prickly, especially about the head. Its food is prawns and small crabs, which would be perhaps more valuable than itself,—could they grow into large ones. There are several species of gurnards of divers colours and markings, which remind us of a particular class of old ladies, well protected about the head. Some are grey, some are yellow and spotted, some are red from various causes. They are prickly to handle, as they are beset with pins, and require the aid of every art in dress, to make them relished by society.

The bullhead or miller's thumb (*Cottus gobio*, Linn.) is a little river fish. Its food consists of larva and the spawn of frogs; it is easily caught. This fish is typical of the most rustic form of "Mr. Bull"—a miller perhaps, after whose thumb the head of the creature is named. These fish usually keep at the bottom of the water, and like the men that resemble them, are wide in the head. Without being exactly stupid, they are slow and heavy, unwilling to move away from their favourite haunts, which are frequently LOW.

The stickleback (*Gasterosteus aculeatus*, Linn.) is a little tyrant in our brooks and pools. The males in the breeding season attack with ferocity all the small fish that approach their corners of the ponds. They frequently engage in mortal combat with males of their species which they rip up with

their spines. The female constructs a curious nest for her spawn, showing analogy with other and higher orders, usually so distinct in habits from fish. The pugnacious sticklebacks, erect their spines like porcupines when they fight. Boars also whet their tusks; Insects prepare their stings; and Man his weapons. Although not placed in a ferocious genus like the sharks, yet they are not to be excelled in courage and boldness by any fish. Their efforts and conflicts appear puny, like those of little men, who however often fight to the last.

The mackerel (*Scomber scombrus*) is one of the migratory fishes, and forms a part of that shoal of plenty—"The Abundance of the Seas," which it has pleased Providence to pour into our laps. The different successions of fishes at diverse seasons, and their various migrations, illustrate the life of man.

These fishes do not wander towards the pole, to return to our shores in spring as was formerly supposed; but remain round our coasts during the whole of the year: spawning in the shallow water and retiring to the deep to expand in size. The young fish require the sun's concentrated rays for their development in their early stages; which remind us of the early forcing stages in vegetable life.

The growth of man's mind is similar. He first requires to see matters in a strong light, that ardour may be kindled, and strength gained in him. This is especially a necessary preparation for "the *launch*" of the young man into the "sea of knowledge;" without which he might soon "get beyond his depth."

The small fry of the mackerel seek deeper water, and can scarcely be discerned in the depths. There they grow larger, and at last come into shallower water where we enjoy fishing for them, and we profit by their long retirement, and find that they have grown in size and increased in value. If we are wise, we do not follow them when they go into the shallowest pools, to spawn amongst the weeds.

Men of genius are often thought to be "odd fish," and like other *fish* have their periods of retirement from observation. Then they should be let alone, that they may have leisure for the propagation of their ideas, to come forth in due time with *shoals of precious food*, of which SCHOOLS may partake.

The mackerel is a most beautiful fish in shape and markings, which latter are implied by its name. This fish is formed to cut through the water with great rapidity. It is a strong flavoured though favourite fish. They bite eagerly and greedily at a bait; a bit of the tail of a mackerel being a favourite.

A mackerel sky, an indication of foul weather, is beautifully variegated like the marks of this creature, which resemble the

colours seen on the sea and sky, blue, green, and silvery white. The dark stripes on a light ground, typify approaching tempest; although the sky may be at present clear and beautifully blue. The white waves of the sea below, are illustrated in the silvery belly of the fish. A piece of red cloth is said to be "a mackerel bait for a lady," in allusion to the facility, with which both the fish and the Fair, are caught by scarlet.

The tunny (*Thynnus vulgaris*, Cuv.) is a large fish allied to the mackerel, much in favour with the natives of Italy and other countries bounded by the Mediterranean. It is very gregarious, appearing in vast shoals in its native sea, but it is rarely seen on our coast. It greedily follows and devours smaller fish, and is often itself the prey of the porpoise; like its ally the mackerel. Creatures that *prey* on others, are themselves "a prey." "All that take the sword, are liable to perish by the sword."

The John dory's (*Zeus faber*, Linn.) name is derived from the French *adoré*, worshipped; while the generic name is that of Jupiter; and the fish itself, is said by the fishermen of the Adriatic, to bear the marks of St. Peter's fingers. *A series of associations appropriate to "the fish of St. Peter."* The head is large and ugly, and its whole shape grotesque.

The boar-fish (*Capros aper*, Lacépède) has a resemblance to a boar in form of head, as well as in bristling spines. It is strongly scented and distinguished for ferocity, in which it however yields precedence to the wolf-fish (*Anarrhichus lupus*). This last is more properly called "the sea cat;" which latter quadruped it resembles in character, form, and markings about the head. It has strong, sharp teeth, and knows well how to use them. Even if caught, it will greedily attack any small fish or crabs in the same net; out of which it often escapes; for it will cunningly divide the meshes of the net with its teeth. It is excellent food when the popular dislike to its appearance and character is overcome.

On board ship, we have often one or more individuals, who may be called "*sea cats*." They are cruel to those in their vicinity, even if shipwrecked or otherwise in great danger; for their natural savageness, is not subdued by calamity.

The fishing-frog (*Lophius piscatorius*, Linn.) is like a tadpole in shape, the head occupying a larger space than the trunk. It has two fins which act almost like feet, and enable it to jump up from the bottom and seize its prey; for being a slow swimmer it could not pursue it at a rapid rate. It has three spines on its head, capable of being erected or depressed at pleasure. The foremost of these has a curious leaf-like form, which acts as a bait, when the creature crouches down at the bottom of

the sea. It stirs up the mud with its fins and elevating its spines they attract small fish, which attempting to seize the seeming prey, are caught by the "fishing-frog." This animal shows extraordinary analogy to a successful fisherman. The stomach of the "angler-fish," is often emptied by anglers of the human species for their own benefit. This fish's mode of taking its prey, shows that creatures so repulsive in aspect, and tardy in motion, require the aid of artifice to secure a meal, which we see also exemplified by human fishers.

The tree-climbing fish (*Anabas testudineus*) is well known to ascend palm trees in search of food, supporting itself by its sharp spines, with which it can progress with ease, up perpendicular surfaces. They can remain *five or six days* out of the water, with the aid of their *pharyngeals*, which are constructed to contain a quantity of water, and drop gradually on their *branchiæ*, so as to moisten them sufficiently to support respiration. Thus singularly constituted, they are enabled to live out of the water, long enough to perform considerable journeys overland.

The inhabitants of Siam and India beyond the Ganges, husband their resources more thoroughly than most nations, by which they are enabled to withstand famines and drought; while the inhabitants of other countries, belonging to higher races, under similar circumstances, die as fast "as fish" in general do "out of water."

These fish are very pugnacious and are kept for fighting in Siam, as cocks were in England. And being taxed by the king's government, produce a considerable revenue. A savage source of profit doubtless, but suitable to a compound nation like theirs, and illustrated in the habits of this fish; which unites those of a quadruped with those of its own order.

The flying-fish (*Exocetus volitans*) is more graceful than the flying gurnard. It inhabits the Atlantic ocean, and is gifted with extraordinary powers, to enable it to escape from its numerous enemies, both among the larger fish as the Coryphæne, and among the birds. Flying-fish are supported for a few moments with the aid of their long fins. These so-called "wings" merely serve to break their fall, and the impetus with which they rise from the water, carries them on a short distance. This is disputed by some observers. The Coryphæne rushes through the water, and bounds out of it, after the flying-fish. The little flying-fish can fly two hundred yards, while the Coryphæne cannot go above forty feet between each bound. But as it glides through the sea at a rapid rate, at each leap it gains on the flying-fish, which seldom escapes at last; and were they not so very numerous they would soon be extirpated.

The skill of the commanders of small vessels, when in conflict with those of great ones, is usually exerted in efforts, to escape from their more powerful foes. Their ships are often crank craft, and were they of large size, could easily escape by flight, but their small size gives them little *lever* power over the waves; while the great length of the opposing vessels, gives them on the contrary great power over the same element. Their only safety lies in their small size, which sometimes enables them to retire into shallow water, where their enemies could not follow them. They may exceed them as much in size as the Coryphæne does the flying-fish.

The carp (*Cyprinus carpio*, Linn.) was introduced into England at an early period, and according to Izaak Walton is the "Queen of River Fish." It has been much admired for the table, but has of late years become less fashionable. They are remarkably tenacious of life, have a stout form, are wonderfully prolific, and can flourish in unhealthy ponds. That they were introduced from the Continent is certain, like our Saxon ancestors, who are entitled to the name of "Queen of Nations." They are fertile above almost every other Nation, stout in body and difficult to kill. They are voracious, and can live where other nations would die.

The goldfish (*Cyprinus auratus*) so familiar to most persons, was introduced from China where it is of less value than the common carp, which is so much more modestly coloured. In its vivid tints it resembles the attire of the emperors of China who are more gorgeously dressed, but have less energy and are more insignificant and less useful than European Princes.

The bleak (*Leuciscus alburnus*, Cuv.) yields a fine pearly dust from its scales, which is used to give to glass beads, the lustre of oriental pearls. A desire to possess the treasures of distant lands is very prevalent; genuine if possible, or *counterfeit* if these are not to be had. Many articles are valued in proportion to the difficulty in procuring them, or the distance from which they are brought. Oriental pearls are of this character, as contrasted with pearls of OUR own streams and lakes, which are purer and more delicate than those of the East.

The loach (*Cobitis barbatula*, Linn.) is a common little species in brooks, amongst the stones, which its dusky colour often resembles. This species is uneasy and restless in stormy weather, and has been kept in vases, for the purpose of indicating changes in the atmosphere by its movements; which are probably influenced by the electric condition of the air. The conduct of eels is similar in thunder-weather. Individuals amongst us are almost "human barometers." Some plants also, are nearly infallible indicators of atmospheric changes.

The pilot-fish (*Naucrates ductor*, Cuv.) is another creature, which shows analogy, to an occupation amongst men. The Romans said, that a fish which they called "*Pompilius*," was often the means of indicating the right course to a ship on a voyage, when that was doubtful. It had a Greek name, signifying "*companion*," and was reckoned sacred. The pilot-fish is a guide to sharks, as to men ;—acting the part of a jackal to the great fish of prey ; pointing out their food to them, and snapping up any little portions unworthy of their attention. It doubtless follows ships, for what it can get :—a sure type of the pilots of our own day.

The gudgeon (*Gobio fluviatilis*, Willoughby) is a greedy, bold little fish, biting at the smallest bait, with proverbial readiness. When about to angle for them, the fisher is recommended to scratch the bottom of the water with a rake, by which the soil is disturbed, and numerous insects with their larvæ, are exposed which attract the gudgeons in numbers to the spot. They typify human subjects, "easily caught" by trifling inducements, who eagerly rush towards any "field," where there is commotion or excitement.

The tench (*Tinca vulgaris*, Cuv.) was called by old writers the physician among fishes ; in common with whom, they can live almost anywhere. In the dirtiest and most unhealthy ponds, these fish appear to flourish best ; loving weeds more than clear water. There they can prey better, and can accommodate themselves to almost any hole ; getting "rich and fat," as other fish get lean and miserable. It is popularly supposed, that the tench and his analogue, are among the most useful of their classes.

The salmon (*Salmo salar*, Linn.) is termed "the king of river fish," from its beauty of form, size, and rich colouring ; the extent of its range, and wonderful power as a leaper. This fish ascends our rivers to spawn, not being stopped in its progress by wears, waterfalls or rapids ; unless when very lofty. The salmon in its various stages, has often been taken for distinct species of fish, which vary greatly in value according to stage ; the young fish being worth much less, even by weight, than the full-sized salmon. These stages may represent the various degrees of value attached to different metals. The parrs may represent iron ; the smolts brass and the full-grown salmon silver. The destruction of the parrs is like that of the small capital of a nation or of an individual, which has not yet got beyond the value of copper coins ;—a value like the young salmon's, which if left to expand, produces a thousandfold in silver.

The salmon in its various stages, floats in our brain, an image of the commercial and national history of England. The nation like the ova of the salmon, was small at first but contained in itself the seeds of all its future greatness. The ova stage of the salmon, which has its beginning in the higher waters, is like the Saxon; the fry stage is like the Norman, which deeply agitated the western world of waters. The parr stage of the salmon lasts long, as did the age of the Plantagenets; for these princes like the parrs, sought the sea for conquest. The smolts are an intermediate stage, they are almost salmon; a fish good for the table, and from their advanced development may illustrate an intermediate period in history, such as that of the days of the Tudors. The grilse are young salmon, but still are very different from the full-grown fish. They may represent the age of the Stuarts, *who did not satisfy the people;* who longed for something better. At last they got the House of Hanover and our more fully developed Constitution; illustrated in the full-grown salmon, which are glorious fish.

They have been much lessened in numbers by folly and greed combined, in the mismanagement of rivers; which illustrates the encroachments on the royal prerogative. It is often said that a large factory on a river, though perhaps poisoning the stream, and killing all the fish, is better than a river full of "royal salmon." But our wiser men have lately thought that with proper care, we may have *both.* And now Imperial power wraps its mantle round the "royal fish."

The salmon trout (*Salmo trutta*) is the finest of the trouts and nearly approaches the salmon. Where it can, it visits the sea, but exists in lakes which have no connexion therewith, and can there propagate perfectly. It frequently reaches a size equalling that of an ordinary salmon.

Our chief nobility are like the salmon trout, equal in bulk and wealth to some of the "Royal salmon" of other nations. These succeed best when they can communicate with the sea. The minds of nobility expand by foreign travel; *yet sometimes fine and well flavoured "fish" are met with, which have not moved far from where they were "spawned."*

The common trout (*Salmo fario,* Linn.) is our most widely dispersed river fish, and a trout stream, is thought a great addition to the sporting value of the property of a country squire. Good fresh trout are fine in flavour, but vary much in taste as well as in size; soil and situation have doubtless much to do with this. We consider trout as a type of the older gentry, who are yet smaller, and less noble than the aristocracy. They are shy in habits, and do not like their privacy to be invaded; driving *parvenus* away, as trout do pike or carp, from their

favourite holes.—Thus squires will not have poaching on their properties. Sometimes these trout eat the ova of the more "noble *salmon*," in which they represent radical squires.

The grayling (*Thymallus vulgaris*, Cuv.) is a local fish, inhabiting principally mountain streams, with stony bottoms; in the most romantic and beautiful parts of England and Wales. —It is of a smaller size than the trouts. This choice fish has a peculiarly rich and aromatic flavour, when freshly caught. The angler sits on a bank where the "wild thyme grows," overhanging a clear stream, where with his lively fly, he entices the fish, which when drawn out of the water surpasses the sweet scent of the plant.

The inhabitants of our mountain districts still preserve much of the freshness and simplicity of a past age. Remove them to town and they disgust us, as this fish does when carried far from home;—it can only be enjoyed on the spot. Where many tourists go the natives become spoiled; and the fish become scarce. They cannot bear the muddy stream or brook, where manufacture grimly grinds its iron teeth; for it pollutes earth and poisons life with infernal smoke.

The pilchard, the herring of Cornwall (*Clupea pilchardus*, Block), is found on its coast throughout the year, but most abundantly in autumn. It appears in countless numbers, *twenty-five millions* have been taken on shore in one day at a single port.—A HERRING FOR EVERY INHABITANT OF ENGLAND, which like the pilchards, has sent forth shoals for the benefit of other lands. An enormous amount of money is spent in pursuing these fish, which produce more profit to those who buy them than to those who catch them.

The pilchards approach the coast like an invading army, but one whose presence is looked forward to with pleasure, as a deliverer from the pangs of hunger. This army is divided into three divisions when it appears on our south-western coast, of which the first is eastward of the Lizard, stretching to the bay of Bigbury in Devonshire (Yarrell), beyond which no fishing is carried on. A second position extends between the Lizard and Land's End, and a third is on the north coast of Cornwall, the head-quarters of which is about St. Ives. In the drift-net fishery, they start at sunset, and draw their nets in about two hours; which is rapid progress, compared with that of seine fishing.

In seine fishing the fish are surrounded, and several seines are shot and afterwards fastened together; great caution being used not to alarm the fish by noise. They are often kept alive a week in the seine, and dipped out by degrees with baskets, as they are wanted for use.

This invasion of pilchards reminds us of the "commercial invasions," by which we are put in possession of riches, not to be otherwise obtained. The catchers, like inventors or introducers of what is most useful to the public in general, do not gain the greatest profit. Those who fish in the sea of knowledge *with drift nets take a less amount of "fish*;" but are frequently better off than those, who by devoting all their energies to the more certain *seine-like* method of enclosure,—or inductive method in philosophy, may gain higher prizes ; but may lose more largely. The "fishmongers" profit more than the fishers. Some clever manufacturers retail and apply the inventions of sublime minds, whom they would gladly cheat of the original bare credit of the invention, if they could ; as they may have already done of the pecuniary benefit by some tricky patent.

The herring (*Clupea harengus*) is the species most numerously taken on our coasts, and more generally distributed than the pilchard, being found from the Orkneys to Yarmouth.

This great invading host, divides itself into two branches at the Shetland islands. The first division, visits almost every bay and creek on the western coast, while the second proceeds towards Yarmouth on the eastern coast, and is lost at length in the British Channel. The western branch visits the Hebrides first ; where they divide again, one detachment passing through the Irish sea, carrying food to the inhabitants, while the other is lost in the Atlantic. But they are by no means perfectly regular in their appearance, and require not to be driven from their haunts by foul treatment.

The herring visits Greenland and Iceland rarely, but the coast of Holland abundantly. Amsterdam has been said to be "built on herring-bones," in allusion to the prosperity the port enjoys, in consequence of the profits on the fishery.

The herring is a true Teutonic fish, as those who pursue it are mostly Teutons. Celts are bad fishermen. It is not a little strange, that a species nearly allied, if not identical with our common herring, exists in the fresh-water lake Baikal, in Chinese Tartary. Typical of the Teutons who have been forced contrary to their inclination, to colonize that distant region. We can hardly fancy them at home there, yet they multiply and prove good settlers.

The sprat (*Clupea sprattus*, Linn.) is a little fish allied to the herring, of which our early naturalists considered it the young. From its great numbers it is of considerable value to the poorer classes, though inferior to the herrings. It is a coarse and rank fish to the taste, yet enjoyed by the grosser sections of the Teutons. They are cheap and wholesome, and far too good for manure, for which they are often sold. A sad waste of valuable

life; contrary to the principle, that it is inexpedient for man, at the head of creation, to destroy a higher life for the mere sake of feeding a lower one. Although the fact of the absorption of the particles no longer required by the higher life, and that cannot be utilized by it, may in accordance with that perfect utilitarian system which pervades all life, nourish the meanest organism. When an Organism has once lost its *vitality*, it is the prey of living organisms; or still lower, sinks into the Inorganic world.

"Imperial Cæsar—*dead* and turned to clay,
Might *stop a hole* to keep the wind away."

These sprats among fish, have always been associated in our mind with "little sprats of children," who like them defile what they touch; but yet fill the gaps in the lower population, made by the hungry mouth of death.

The white-bait (*Clupea alba*) is the sprat of the upper classes. Whiter, cleaner and more delicate, than that of the lower; but will not bear carriage without losing its flavour. Even the children of the aristocracy, *lose their freshness* if removed from their favourite localities on the *muddy banks* where they sport, and carried into close rooms.

As might be expected the white-bait is more in vogue in London than elsewhere: particularly with Her Majesty's Ministers in July, when they have "*no other fish to fry*," and are glad to eat these on silver dishes, nicely browned with flour. And in accordance with what is now almost a proverb —DOZE OUT AN AFTERNOON UNDER THE INFLUENCE OF CLARET AND WHITE-BAIT;—THE KNELL OF THE SESSION.

The anchovy (*Engraulis encrasicholus*, Flem.) the sprat of Italy, is popular amongst the upper and middle classes in England for its flavour, and is extensively made into sauces and condimental pastes. It is more as a *flavour* than *as a food* that it is used; serving to spice our more tasteless viands. Most of our educated classes, like a foreign "flavouring" to their pleasures; not being satisfied with what their own country affords; while they are content to take their more bulky food of home growth. We have singers from Italy to flavour our Opera, as we have foreign artists to influence our historical school of design—mostly stale, who have lost the gorgeous colouring of radiant Italy. Andalusia furnishes its dancers, and Greece its literature and sculpture; which are supposed to *lubricate* the pens of our writers, and the chisels of our artists.

The cod (*Morrhua vulgaris*, Cuv.) that good honest fish, that opens its mouth so wide, and bites so greedily; makes itself the most generally useful of fishes; the most wholesome,

nourishing and acceptable as food, of any fish of the sea. Its shoals visit the coast, from Portugal to Iceland, and from Iceland to 40° north latitude. It is commonly fished for all round our coast. Those engaged in its pursuit, salting and sale, number many thousands. It is universally taken by the hook, which is usually left six hours after being baited, before it is hauled up. It is one of the most prolific fish known, *nine millions of ova* have been taken out of one cod. It is the great fish of the banks of Newfoundland; and it is to this creature, that the Island owes its commercial importance.

The cod feeds on crabs and small fish. It is usually brought to London in "well boats," which admit the sea-water freely. The fish are fed in Scotland in artificial preserves, where they increase much in size. The cod is a stupid, gaping fish, with goggle eyes, which remind us of a certain class of Teutons who "swallow baits" easily, and when young are much picked up by "sea gulls," being not too "old" to be "gullible." These fish are the greatest feeders of both themselves and man, although they lose by it.

The cod eminently typifies the Teuton workmen in Celtic countries, who add so much to the comfort of the nations of Europe. These industrious Teutons, shift their ground like the cod, when the Spanish authorities or other illiberal governments, render their position unpleasant. The disappearance of the cod, on a coast where it was formerly abundant is a loss to the country, like that of the most thrifty and superior of the population. We have a memorable instance of this, in the case of the Protestant settlers, who were driven from France, at the time of the Revocation of the "Edict of Nantes," and settled as the cod has lately done, not far from London; and again not far from Norwich.

The Norway cod is a superior variety, it grows to a large size, is in great numbers, and is said to yield a fine oil, supposed to exert a healing influence, on those who need to have their blood purified and enriched. This is typical of the advantages which exist, in the "infusion" even at this date, of "Scandinavian blood" into the veins of many sickly families. But why go to Norway? Have we not cod on our own coasts? Yes,—although the better of some of theirs.—We possess the power of healing, many of our own social and physical diseases.

The haddock (*Morrhua æglefinus*, Cuv.) is a fish much in request, and abundantly does it accede to the demand, being found in the German Ocean, and on the Atlantic coasts of Europe. Their shoals are very dense, but capricious in appearance. They are hungry, greedy fish, consuming great quan-

tities of food. The haddock salts and keeps well. We see analogy in them to the Belgæ, who early peopled part of Europe, and also to the Celtic Scandinavians.

The pure Celts remind us of the whiting (*Morrhua lusca*, Flem.), rather a weaker, smaller kind of fish, which may be divided into two branches, the pouts and the silver whiting. The pouts like the British Celts, are the least elegant of the family. They are common in Cornwall, Ireland, Carnarvonshire and nearly all round the coast.

The flesh of the pout is excellent, but does not keep so well as cod or haddock; yet is not to be despised. The true whiting is the most delicate and does not offend the most fastidious palate. It is voracious, seizing everything within its grasp. Like the French Celts, who are so much more elegant than our own, but not the less greedy; they feed on the weaker of the Teutons, as the whiting does on the sprats and pilchards.

In the coal-fish (*Merlangus carbonarius*, Cuv.) of the northern sea, *enterprising* and prowling, we see a likeness to the hardy inhabitants of the Orkneys and Shetland, who visit the Arctic regions. In actual power in our population they are not great, but their energy gives them a respectable place.

The plaice (*Platessa vulgaris*, Flem.) with which we commence the flat fish, is a genus remarkable even amongst fish. The head is curiously adjusted to the spine, both eyes being on one side of the head. One eye is frequently smaller than the other. The mouth is peculiarly placed on one side, and the fins unequally on the two sides.

The more we examine these creatures, the more firmly do we become convinced of their perfect adaptation to their habits. The belly is perfectly white, and the colouring on the upper side, often resembles that of the rocks and soils they rest upon. If most of the species of flat fish, were of the same pure white on the back, as they are underneath, it would cause them to be observed and extirpated by their enemies.

Their flat bodies are typical of low life; what is *flat* in nature being generally of low origin. A flat country does not generally inspire elevating impressions; neither does a "flat face." And we do not admire the walk of a "flat-soled" individual, particularly if he has a "flat head," which is not often an elevated one; although "table land" does exist; both in geography and craniology. Inequalities in the face and brain are typified by these fish. If we see a man with one eye larger than the other, or one side of the head larger than the other; we argue "a *onesided character*," the individual showing "a double countenance" at different times. Such persons may be

great in size both in mind and body, but are not always to be depended upon in cases of emergency.

The plaice attains a large size, and is one of the most abundant of our flat fishes on all parts of the coast, and is highly valued as food, in common with all its genus. Where the sea is transparent they are speared in pretty deep water, by means of a short heavy weapon, to which a line is attached, and is then drawn up to the surface of the water.

These stupid fish, fall a prey to the *angler-fish*, as well as to those who use "the angle." They swim but slowly along the bottom, but if they rise to the top, they are often seized by fishes that swim much on the surface. Persons who look one way and speak another, are taken unawares. The plaice is a ground fish and is much eaten by the lower classes.

The flounder (*Platessa flessus*, Flem.) is the commonest of our flat fish, both in the sea and in rivers, at a considerable distance from their mouths. It is not unappropriately called "fleuke," as it is supposed to be the type of awkward movements, inexpressibly graceless, like that of floundering in the mud; a habit in the creature when the tide runs out at the mouth of the river. Like that "*tide of prosperity*," which has so long flowed on a successful though uninteresting merchant, who has done little to merit wealth, yet "swims in it." But at length the "tide of prosperity" runs out, and the merchant is left to his own resources. He is as helpless as the gasping fish on the mud.

A commercial brother more fortunate, swims in the returning tide, and sees his poor brother stripped by an accountant; as a carrion crow might pick the bones of a flounder on the mud of the Thames. Flounders are very dark in colour, and prefer the lowest parts of the mouths of rivers, to the surfaces of the limpid stream. Their antitypes amongst commercial men, have dark skins, and prefer the town to the country.

The dab (*Platessa limanda*, Flem.) is found on sandy coasts, and is distinguished from the flounder by the curve in the black line on its back. It has a very rough skin like a file: hence its Latin name *limanda*—a file. It is better in taste, than either plaice or flounder. It reminds us of the exclusively marine merchant; who is nicer in habits, but rougher than the flounder and his type. He is not so often stranded on the "muddy shore," but frequently on the Goodwin or other "yellow sands." There he is shipwrecked of life and property. The sea that supported him, recedes from him, and he meets there "a dry death."

The halibut (*Hippoglossus vulgaris*, Flem.) is the largest of the British flat fish, and is most common in the northern and Arctic seas. These fish are most abundant in "flat pieces of

water," between islands ; out of reach of strong currents and eddies. They yield a quantity of oil. The halibut feeds on its smaller brethren. Notwithstanding its large size, it is not very much valued, being coarse and hard in flesh.

In this fish we see an analogy, with the merchant of the north. He is coarse and rough in speech, but strong and large ; and if we can only be induced to tolerate him, he is exceedingly profitable to society, outweighing many others who are more generally prized. Such are the unfavourable specimens of the Scandinavian mercantile class. You cannot move them beyond a certain extent. Other persons will do more on an occasion ; but their regularity and steadiness, in the end triumph over their more meteoric southern kindred.

The turbot (*Rhombus maximus*, Cuv.) is considered the choicest of our flat fishes for the table, and reaches a very large size, being found on almost all parts of the coast ; but is more common in some places than others. From the Wash to the coast of Holland, is the portion of the sea where they are most abundant. The English do not succeed so well with fishing as the Dutch and the Scandinavian nations, who are more thoroughly at home on board ship even than we are.

The turbot fishery is very successful off the little island of Heligoland, from which the Dutch, who think they ought to be the masters of the island, reap a much larger profit by the mere sale of the turbot than the British Sovereigns of the land. The turbot is choice in its selection of food, wandering about the bottom of the sea in shoals for that purpose, and rejecting any bait in the least degree stale.

Our epicures admire this fish much, although they would not like the Roman emperor Domitian, summon Parliament to consult about the best mode of cooking it. Still a solemn *senatus consultum* of cooks, is thought necessary to deal with an extra large turbot for a London club dinner.

The turbot presents us with an illustration of the London merchant, feeding daintily, and turning up his nose at anything that is not of the choicest that the season affords. Foreign merchants and tradesmen, fatten by contributing to gratify his tastes. These Dutch turbots, represent a wealthy class of Hollanders and their descendants, settled in London ; who make money fast, and are very *solid* in their transactions. They make more than the old-fashioned English merchant, being more self-denying and orderly ; and like the turbot they are also *rounder* in shape. In after life they are very broad in the body especially towards the centre, which is also by far the widest part of the fish.

The brill (*Rhombus vulgaris*, Cuv.) is considered the flat fish

next in value to the turbot; but by some it is placed lower than the sole. It is more rank and coarse than either. If turbot be put at the head of the table, the brill is placed at the foot—and may be compared with the junior partner of the merchant, who though he has an inferior place, yet gets a share of the lobster sauce; showing how far he is indulged in his appetites. From having been originally in a lower station, he has perhaps, not even the degree of refinement and *delicacy* of the senior partner.

The sole (*Solea vulgaris*, Cuv.) to our taste has the finest flavour of any fish, and is one of the most favourite for the table. It is long and narrow in shape, compared with the turbot. It does not attain the size of the turbot or brill, and although a salt-water fish, will thrive in fresh water. They are sometimes brown on both sides, and the eyes and mouth usually on the right side, are sometimes found to be on the left side.

These flat fish appear to be most popular with the majority of persons. Flat uninteresting minds are the most common. The salmon the emblem of the precious metals, is worshipped as being the richest fish, the type of regal wealth and magnificence; while commerce is adored in the turbot, and the high-flavoured notions of the age in the sole.—The *soul*—alike only in sound,—is forgotten. These long-shaped fish from their very length, are emblematic of the long-drawn, spun-out characters of men; by which vastly greater length than breadth is attained, and when depth comes to be considered, we see how "shallow" they are; like their emblems the flat fish, in spite of their fine flavour.

The remora (*Echeneis remora*), the most curious of the sucking fish, by means of its flattened disk, near the head, exhausts the air between it, and any object it may wish to adhere to, living or dead. The Mediterranean species here referred to, was well known to the Greeks and Romans. The fish is slow in motion, and cannot go at a rapid rate through the water, unless attached to some more swiftly moving object, which may afford it food by the parasitic animals adhering thereto. Showing that fishes have parasites of their own class, as well as of lower classes, who preying on their crustacean and molluscan parasites, rid them of many pests of a noxious character.

The habits of this fish, suggest a means by which the bottoms of ships can be approached, when they are under the water; and point out where improvements should be made in the diving bells at present in use. A diving bell used for the purpose of ascertaining the state of a ship's bottom, must not be independent of the ship, on account of the eddies, which

counteract the natural attraction of small, to large bodies. Alternate attraction and repulsion, without the introduction of some stronger force, would provoke concussion, between a loose diving bell and the ship.

Eels (*Anguilla acutirostris*, Yarrell) have an external resemblance to snakes, but are as true fish as any. They breathe slowly, and can remain a long time under water,—even months in the mud, during the winter season. They are very rich but rather strongly flavoured, and only find favour with those who have not delicate stomachs. The Dutch deal much in eels, which are very abundant in the canals and ditches of their country. They are tamed in the Polynesian islands, where they attain a large size, eating freely out of the hands of those they are accustomed to.

Eels are impatient of cold, and do not exist in the arctic regions. In our climate they are speared, during cold weather as they lie buried in the mud of rivers or ditches. To remain in this state so long, indicates the *lowest condition of respiration.* Throughout the animal kingdom this is accompanied with a low degree of irritability, both of nerve and muscular action; and contrary to what is remarked, that long and lean animals commonly exceed stouter ones in activity. Had eels large fins, and did they move in a straight line, they would doubtless be among the most active fishes: but their serpentine course lengthens their route through the water, and is the means of explaining much in their history.—AN INDIRECT COURSE IS USUALLY THE LONGEST.

These long-lived eels, so low and earthy in habits, like snakes and other animals of languid circulation, possess an extraordinary tenacity of life, in which they typify the reptile class among moral beings, "whose lives have been prolonged for a season and a time;" while others more elevated in character and habits, live but a short day, to rise to a future life of happiness. The eel's richness is typical of the wealth, which those who live long, worship. These fishy worms and their types, often enjoy their pleasures long.

The great pipe fish (*Syngnathus acus*, Linn.) belongs to a singular tribe, possessing a very elongated beak, which has a curious valve-like jaw at the extremity. The female sheds her spawn into a sort of pouch under the belly of the male, in which they are hatched, according to Mr. Walcot's account, quoted by Mr. Yarrell in his "British Fishes," and confirmed by four foreign naturalists. The male alone has the pouch into which it receives the young fish when danger approaches.

The great length of their tube resembles the woodcock's beak amongst birds, as their body does the shape of a reptile;

and they approach the Marsupials among quadrupeds, in having a pouch for the reception of the young.

In a creature which presents analogy with so many branches of the animal kingdom, we see what reminds us of varied forms of spiritual influences, at once earthly, aerial and marine, which this creature's structure, instincts and habits illustrate, though to a feeble extent. Its shape resembles the usual descriptions of the great sea serpent. The sea serpent typifies the "Dragon that is in the Sea," being indistinctly seen, and has never been captured and perhaps never can be, by human hands.

CHAPTER VII.

TEACHINGS THROUGH THE STUDY OF REPTILES.

TORTOISES — ALLIGATOR-TORTOISE — CROCODILE — ALLIGATOR — CHAMELEON — MONITOR — AMBLYRHYNCHUS — IGUANA — BLIND-WORM — SNAKE — PYTHON — BOA — COBRA — VIPER — RATTLE-SNAKE — SEA-SNAKE — FROGS — TOAD — PIPA — NEWTS — SALAMANDERS — PROTEUS — LEPIDOSIREN.

A HORROR of and shrinking from reptiles, appears to be deeply impressed on the mind of man. It probably commenced at an early period, with his "temptation and fall." In all ages and in most countries, reptiles have been objects of adoration by those who worship power for its own sake, and that often in proportion to the mischief committed by its abuse.

Tortoises have been in all ages a type of slow progression, but their progress is of a steady character. Gifted with little intelligence, they are yet pertinacious in their pursuits, and thus accomplish greater things than some animals whose circulation is more rapid. Their shield of hard plates, renders them safe from the attacks of most animals, but some of the eagle tribe have been known to lift them in their talons, and carrying them to a great height, let them fall so as to break the shell, and then feast on their softer parts.

In the harmless tortoise, we see an analogy to the quiet and inoffensive amongst ourselves, who are guiltless of bloodshed, and are willing to work hard for the sake of accomplishing what is necessary, even if that be a slow process. It is said of the tortoise that previous to hybernation, it slowly excavates a chamber in the earth for itself, but proceeds more rapidly in proportion to the coldness of the weather, until the work is finally accomplished. In like manner our slow men, are often unwilling to exert themselves except when obliged; but can do a good deal, and often provide a comfortable home for "the winter of life." During the summer the tortoises breed, bury their eggs, and leave them without further thought. Some very lymphatic men are comparatively indifferent about their offspring.

The great tortoise (*Testudo indicus*) of the Galapagos Archipelago, is one of the largest of its tribe. Unlike some other species it drinks large quantities of water, and forms paths down to the drinking places, by following which the Spaniards often discover water. These tortoises are said to move at the rate of eight miles in two or three days—a good distance considering how slowly they travel: proving what can be done by constant motion, even of the most leisurely kind.

When caught by the natives, the animal is slit near the tail with a knife; and if fat killed outright for food; but if lean is liberated that it may become so.

The natives of these islands are suitable in character and civilization with the fauna,—one of the most curious on the globe. The inhabitants are degraded, having been mostly convicted of crimes, and banished from the main land. The islands are as unproductive of great events as of great plants. The large animals are reptiles; and in like manner the energy of the population is of a debased character.

The alligator-tortoise (*Chelydra serpentina*) is the fiercest of its kind, snapping up fish, young water-fowl, and even venturing to attack man by biting off his fingers when he comes in its way. It is common to Canada and the United States, and shows a considerable likeness to the skulking Indian tribes, who do not hesitate to attack, when they fall in with those worth plundering. They combine the cruel treachery of the snake or lizard, with the impenetrability of the tortoise.

The alligator-tortoise has powerful prehensile claws, with which it lays hold, while it bites furiously with its toothless mouth. Its eye and upper jaw, resemble those of a ferocious hawk:—it has not a spark of gentleness.

These shielded reptiles are typical of modern engines of war by sea and land. In the "Monitors" and "Cupola ships," we see the turtles illustrated, which has been formerly remarked by other writers, and in the tortoises we see a resemblance to the shore batteries and land defences. The Romans even, used plated shields suggested by this creature, in their attacks on fortifications; they were called *Testudo* (see Livy, b. x. c. 43). The plates are capable of resisting an immense amount of pressure, and on a reptile's back are typical of the degraded condition of society which renders these means of defence necessary. Yet the tortoise is not a type of *degradation* so great as is the snake or the lizard, which typify demoniacal influences. The shield reptiles may illustrate corrupted man; but the alligator-tortoise, illustrates him possessed by a demon.

Shield reptiles become very fat, and afford sustenance to many persons. This may be emblematic of the commercial

prosperity, and high state of living which often accompany preparations for war. It has been justly argued that these means of defence are necessary for the protection of the wealth that lies beneath the shield, which would without a strong defence,—like the fat of the reptile, be exposed to plunder.

The crocodile is the chief of the lizards, their king and emperor, and well does he represent Beelzebub, typified by "the Leviathan" of Scripture. This creature has more boldness than any of the lizards, and is effectually protected against attacks; being impenetrable to most weapons on the back and tail. Its teeth overlap each other; and when the mouth is suddenly shut they sometimes enter the opposite jaw with such force as to become embedded, so that its mouth cannot be opened without an iron lever. It seizes animals of moderate size, and dragging them under water drowns them, bringing them on shore to be devoured.

The crocodile's eggs are small, and in this state, or while very young it is easily killed. When of a large size it is very formidable, and possesses enormous strength; its daring and courage being also excessive.—Its voice is a hollow sepulchral growl.

Nations who are most in darkness and under Satanic influence, are the most cruel and savage. These have the largest lizards among them, such as the natives of tropical Africa. According to Dr. Livingstone the Bakwains of South Africa, have a horror of this animal. "When they see it they spit on the ground and say, '*there is sin.*'" Alligators are found in most parts of tropical America, the Indian Archipelago, and other regions, where morality and religion are at the lowest ebb. The most important lizard is the *Crocodilus vulgaris* of the Nile. In some districts of Egypt according to Strabo they used to worship this great lizard, which was fed and treated with every honour. According to Champollion it was called *Souchis*, the Egyptian name for Saturn.

It may be as well to mention here, the probable analogy between the reign of this god Saturn and Satan, which preceded that of Jove or Jehovah, by whom he was rendered incapable of reigning; while Jove took his place. This was perhaps founded on the tradition of Satan inhabiting the earth, from which he was driven by superior power.

The crocodile's aspect is terrible, not by any means charming. He represents Satan triumphant but enraged, not as a seducer, but as a destroyer: for this great lizard is an enemy to most animals. But the little spur-winged plover (*Holopterus spinosus*) called by the Dongolians "*El-Um-Tisaad*, the crocodile's niece," is allowed to perch on its back, and even

enter its mouth to extract leeches, or particles of food which cling to this dragon. This bird is a type of those who for the sake of "filthy lucre," become servants of the evil one. "All working together for good" in the scheme of universal government. Thus the spur-winged plover, although the friend of that *enemy* of man and other animals, the crocodile, yet contributes to maintain "the balance in nature."

The alligators of America are found throughout its central regions and the West India islands. Yet in the British West Indies they are generally less numerous and formidable. The state of morality in the latter islands is low surely, but does not reach that mingled condition of idolatry, superstition and licentiousness, that characterize Brazil, Columbia and Central America.

Don Ulloa in his "Voyage to South America," says of the alligator, that "it lays in the space of two or three days, 100 eggs, which it covers with sand, watching the process of hatching from some little distance. It is more than ordinarily furious when any animal approaches the resting-place of the eggs. When the young alligators escape from the shell, they crawl on the mother's back, and are thus conveyed to the water. The turkey buzzards or gallinazos (*Cathartes aura*) devour many of the young alligators, and the *anxious mother* herself eats all the weaker ones."

Such alligators are typical of the Republics of South America. The metaphorical "leviathan" in order to crush man more effectually, reduces him to a low level—a Democracy, that he may the more certainly force him beneath the wheel of the "iron car of war." An intestine form of strife is that most favourable to the utter demoralization and degradation of a country. When the bowels are diseased in the physical man, digestion cannot go on, for they are too much "at war" among themselves to attend to the maintenance of their resources. They require the aid of an extraneous surgeon, if it be not too late. These republics are in a similar state of disorder, which calls for foreign aid to give a chance of a cure.

Crocodiles have little love for their own offspring, unless strong and vigorous, but make them their prey if they show any signs of weakness. Are alligators, so renowned for strength, unwilling to be represented by *feeble* descendants who might not be equal to their numerous enemies? Or does it establish the inconceivable brutality and cruelty of the mother, who devours her own brood, as freely as any other prey?

The chameleon of which there are several species, illustrates forcibly the theory of "The Double Organization," in many branches of the human and animal organism. The chameleon

appears to be an anomalous reptile, one half of its body being more independent of the other half, than is the case with any other creature. One side looks, breathes, is coloured, awakes, while the other is asleep or of a different colour. The eyes are capable of squinting, or of independent motion to an extraordinary extent. In like manner we see how human beings may be paralyzed on one side, and how one hemisphere of the brain may be diseased, and yet the other half of the system may retain its functions to a considerable extent.

In the chameleon we see the many-coloured reptile form, accommodating itself to light and darkness. Assuming the azure of Heaven, the red-brown of Earth, or the neutral tints of Flesh, between the two; and yet so cold withal, that we shrink from its touch.

The chameleon is the type of a journal, taking its *tone* in politics according to "the times," and assuming a "*colouring*" at will, in proportion to the *clearness of the atmosphere*, or the influence of *reflected or transmitted light*. It is "reflected" when it falls in with popular opinion; it is "transmitted" when it becomes a "government organ."

The chameleon is said to have the paw of a parrot. It has a *long tongue* like most "*gobemouches*," and a goggle eye in proportion;—a type of an incessant prattler, who believes what he hears, and who picks up the smallest atoms that fly past him. The prehensile power of the chameleon is great, like the grasp of modern journalism.

The Nilotic monitor (*Monitor niloticus*) is one of the largest of the recent Saurians, and is very tenacious of life, and according to the Arabs destroys many of the eggs of the crocodile. They are amphibious and are said to give warning of the approach of the crocodile, by hissing or whistling. The Nilotic monitors may be compared with the magicians of Egypt, who professed to use their powers for producing or removing calamities. Magicians frequently accompany their spells with noises, resembling those made by reptiles. The familiar spirits, spoke "out of the dust" (Is. xxix. 4) that is to say from a low position, as it were out of the ground, like reptiles.

The dragons of which so much has been said by early writers, were not probably creatures of the imagination, but had their descriptions founded on the remains of extinct Saurians, such as the Pterodactyle.

The present little flying dragon (*Draco volans*) is a small harmless creature, found in the Eastern Archipelago. It lives in trees where it flits from bough to bough like a flying squirrel. Such an animal is trivial when we consider what was for-

merly said of those creatures, and has caused some of us to look on those with pity who fear "the dragon." Formerly he was viewed as an inconceivably awful being of enormous power, but now the "progress of knowledge" has shown him to be a mere harmless lizard, *a jest* compared with the powerful creature he was once supposed to be.

This state of modern feeling is unfortunate in a moral point of view, leading some to trifle with one, who although unseen at present is not the less a reality. The Pterodactyle, a gigantic winged lizard of past ages, is a type of what Satan's power once was, and what it may be again.

The lizards are small compared with the crocodile, but still, some do attain a great size. Those in Great Britain and the Protestant countries of the north of Europe, are few and small; while as we approach the south they become more numerous, attaining their maximum of European development on the shores of the Mediterranean.

Bruce relates that he saw thousands of lizards in one day, in the court of the great temple of the sun at Baalbec, covering the ground and walls of the ruined buildings. Their colour was dazzling to behold as they glittered in the sunbeams. They are suitable types of the ruin and desolate state of what was once magnificent, grand and the wonder of the whole district; but now the abode of lizards, bats and owls!

The *Amblyrhynchus cristatus* of the Galapagos Archipelago is a lead-coloured animal, slow in movement, unintelligent, and hideous in aspect. It has little fear of man; but is harmless and not inclined to bite. Its food is seaweed, which it seeks at the bottom of the sea. It runs freely towards those who injure it, in which it shows extraordinary folly and stupidity. The human inhabitants of these islands are stupid and degraded, and show little desire to lean on a Higher Power who would benefit them; but lean towards vices which are their enemies. Their sustenance is as wretched as their lives. They have little activity, being torpid and reptile like in their habits.

The iguana (*Iguana tuberculata*) of the West Indies is one of the largest of the lizards. It is not formidable, and is eaten as a choice article of food, particularly in the Bahama islands, the inhabitants of which live so much on the spoils of smuggling. —They haunt as these lizards do the remote "Keys" or little islands in their sloops, to be followed by the "Dogs of War," which catch them as the hounds do the iguana.

The lizards of Britain are small and insignificant, and only destroy flies and insects. They typify the influence of the "Evil one" in this country, which is less in our highly favoured land than in some others. Ireland seems to be an exception in having

no lizards; yet in that country the favourite domestic animal is the pig, which is significant of a lower standard of agriculture as of morals, than that prevailing in some other parts of Europe.

The blind-worm (*Anguis fragilis*), is a very quiet inoffensive little creature making no noise, and feeding on earth worms and slugs. Did it not belong to the reptile class, it would meet with more favour; but being so low in its habits, and incapable of raising itself from the ground, it escapes the observation of many. It may typify that degraded race the Gypsies, who appear almost out of place in our land, where they have little influence.

The serpent tribe (*Ophidiæ*) are the great seducers of the animal world, and they only attack what is living. Their structure is of a very simple character; they may be roughly divided into two classes; those that *bite* and those that *crush.* The jaws of serpents are wonderfully elastic, and their bodies are highly flexible and capable of great distension. Their spots illustrate their varied character, and are common to the greater number of species. Almost all the serpent tribe in temperate climates hybernate, and a large number are torpid in the dry season in tropical countries.

As they live to a great age in common with others of the reptile tribe, they are aptly typical of "the *Old* Serpent." This long lease of life, is one reason why they are said to be "*wise*," as "old age,"—if the faculties are retained, gives immense advantages. Old men and animals are much more difficult to catch than young ones.

The different methods pursued by serpents for conquering their prey, illustrate those pursued by Satan. He is smooth and slippery, like the serpent tribe until his grasp is sure, when he displays his relentless character. He acts in two ways, one by *poisoning the blood* of those who fall in his power, corrupting all their *flesh;* the other by crushing their spirits and rendering them without hope, so that he can devour them at leisure. The mouth of serpents reminds one "of the jaws of death." Some are sucked down unconsciously as it were; while others in writhing agony of mind and body,—PASS AWAY.

The common snake (*Tropidonotus natrix*) is a species found in these islands. It is only dangerous to creatures like frogs mice and lizards. They lay their eggs in hotbeds amongst decaying vegetation, where the heat engendered by the putrefying manure is great. Such is representative of the cause of the increase of reptile-like men, who are thus *forced* into greater prominence and increased in number.—Disorganization in society greatly fosters evil influences.

In the present state of the world decomposition must go on;

but after a while these creatures which so much flourish in ruin and decay, will confine themselves to the attack of what is utterly worthless and injurious to society, becoming the special instruments of USE, although in a low place. Scripture makes this clear to us. Serpents appear to have been from the first a symbol of debasement, illustrated by their *low flat foreheads*, which are emblematic of their lives. This is taken up in Genesis, in illustration of the *future degradation* of Satan, whose head was to be bruised; and in harmony with this the serpent tribe is in the holy mountain, to feel a CHARMING influence;—not to be DEAF as the adder formerly was.

The python is one of the largest of the Ophidians. They are not venomous, but are very destructive to smaller animals. Perhaps a graceful antelope comes to drink at a stream in the province of Natal. It is near the water; when it suddenly hears the hiss of a large python, and sees its fierce eyes glaring upon it. The antelope begins to palpitate from fear. It might cross the river and be out of the reach of the serpent in a moment; but while it gazes trembling at its enemy, a coil is thrown round it, followed by several more. In vain the creature writhes, darts out its tongue, bleeds at the nose and mouth, and implores the earth that drinketh in its blood. Its breath is gone in those last sighs. Then its great enemy having broken its bones to short lengths, with his tongue anoints its head, and sucks the whole body down his widening jaws.

In like manner those who trifle with evil, if they have not greater force themselves to resist its serpent-like fascinations, should fly without a moment's pause. But many struck by its aspect, wonderful and terrible, stand in mingled fear and admiration and so become like the fascinated animal,—a prey.

The pythons incubate, laying eighty or ninety eggs on which they sit, and take no food during this period. All that approach them are greeted with a horrid hiss from the mother of the pythons. Just so Satan hatches his evil instruments, protecting them with care until they are ready to "play their parts" and seek their own prey. The Incubation of the Python illustrates the growth of Evil, which is not yet fully mature. The Incubation of the Dove is similarly illustrative of the Dawn of Purity on Earth. According to the Koran, the snow-white doves yet nestle in the Throne of Allah.

Boa constrictors of which four or five species are known, inhabit tropical America, dwelling in swamps over which they rule as emperors among wild animals. The highest trees are climbed by them with ease. They swim like eels in the water and move on the ground with all the celerity of a jaguar.

To a creature of such varied powers the Mexicans gave divine

honours, illustrating the tendency which corrupted man has, to worship what inspires him with the greatest terror. The Mexicans ornamented a figure of one of these serpents with rings of gold, which they placed in their *Teocallis* or temples.

The boa is the most powerful of American reptiles, and when it attains its full size as it does in the tropical regions, no animal can withstand it. This is typical of the gross idolatry into which the southern central Americans were plunged.

Other countries have more numerous animals of prey to divide with the serpents their rule. In this central region, semi-civilized paganism attained its utmost development on the American continent; crushed the miserable population in the coils of superstition; squeezed out *every breath of truth*, and reduced the mass to a state of unconsciousness of what was passing in the rest of the world.

The *Cobra di Capello* or Naja admired as the spectacle snake, but dreaded as one of the most deadly of a venomous class of reptiles, in most cases causes the death of those it bites in a few hours. These creatures are found in Egypt and Hindostan, although distinct species, in harmony with which these countries have been famous for serpent worship, as well as an abject spirit and low Morals. A class of persons exist in these countries, who possess the power of influencing, and to a certain extent taming these animals by words or music. This power is usually called "supernatural," and may be Satanic or Mesmeric. It is probably sometimes one, and sometimes the other; for mankind always have had an idea, that the influence of Satan is exerted in favour of those who become his slaves.

In the action of the poison of these deadly serpents, we see much that is instructive. The speech is first affected, then the respiration; the sight becomes dim, the pulse becomes fainter and fainter, and the extremities cold; death stealing on without that convulsive struggle, which so usually precedes man's exit from this world.

Our parents when bitten by the "Old Serpent," had their *blood poisoned*, which was death to them and their posterity. The "poisoned blood" circulating through their system, has had a corrupting influence throughout. The Deluge in the days of Noah did not heal the disease. The confusion of tongues was another effect of it. This poison is fatal, and can only be met by the introduction of a greater force. "One fire burns out another's burning." A new flame of life flying through the circulating system, separates the poisoned life, which decays; but leaves a cast of a being, in which its former qualities are seen, but yet far higher in tone and purer than they were, before the POISONED BITE.

The viper (*Pelias berus*) is the only venomous snake known in Britain, and those bitten by it do not die so commonly, as by the poisonous serpents of other and hotter lands. The viper varies so much, that it is not quite clear whether there may not be several species included under its name. Its food consists of small mice, young birds and reptiles. It usually brings forth its young alive, from eggs hatched within the body of the mother. When born they show great ferocity, attempting to bite before their fangs are developed, proving them to have even at the earliest stage, the tendencies of their mother the old viper.

Venomous serpents in general are a type of corrupt religious systems, which oppress many lands; but from which even Britain is not entirely free. The depth of iniquity existing in tropical Africa and in Central America, is illustrated by the deadly serpents that inhabit these regions: and the vices of certain of our religious systems, are typified by the British viper which is most to be dreaded by women and children. These have not however always that wholesome horror of *human vipers*, that renders them comparatively harmless; for the viper is most *deadly* when "fostered in the bosom."

The old viper represents paganism; the young vipers its imitations sprung from the same stock. The grandmother of the vipers is "The Old Serpent."

The viper is sometimes oviparous and sometimes *viviparous;* that is to say sometimes born *alive*, and sometimes *hatched* from eggs. Those born alive illustrate acknowledged children, and those hatched from eggs, such as are secretly affiliated to her. As the vipers have different degrees of venom; so the various orders of priests vary in their power of injuring those they dislike; this is partly dependent like the viper's poison, on LOCALITY as well as on SEASON.

Vipers have their homes in places where putrescent matter accumulates. Not that they live on it; for they hunt only for "the precious life," being willing to attack those unsuited for their food, and only want the power to compass their death.

The celebrated rattle-snake (*Crotalidæ horridus*) of North America is fortunately gifted with a noisy rattle, as a warning of its approach to men and animals. The horny rings of the tail alternately expanded and contracted from each other, occasion this clattering sound. This serpent is generally indisposed to attack man or large animals, but its bite is among the most venomous. In summer it is most inclined to attack, while in winter it is torpid or nearly so. A number are frequently found together in a pit lying helplessly coiled round one another; in this state a child can destroy them.

The rattle-snake is said to exercise a fascinating power over squirrels and other small animals, which could easily escape were they inclined. "A way of escape is made" for most men, but the influence of "The Serpent" pins many to earth, which they are unwilling to leave. The wise and enlightened accept the warning sound of the approach of the destroyer, and get out of his way; but those who trifle with him, unless armed with the power to vanquish him,—suffer.

It is advisable that serpents should not be extirpated, as they keep us in mind of the existence of evil agencies; and put us on our guard against them, encouraging and exercising our various powers therein.

The black snake (*Coryphodon constrictor*) of the United States is a formidable reptile, difficult to extirpate. There are black snakes in many countries, as in Australia and the Cape of Good Hope, which illustrate their dark, depraved human populations. That of America does also the Negro, "the great difficulty" in that land.

All serpents cast their skins. For some time they are drowsy, reject food and appear very dull in colour;—the bright shining lustre of their scales is gone. At last they become quite blind, and crawling amongst thorns and brushwood; by their contortions they manage to crack their skin all round the middle, drag themselves through the sharpest thorns head foremost, pull back the skin over their heads like a reversed glove and slip out of the skin at the tail. The skin of the eye likewise comes off. The serpent appears fresh and in tenfold beauty to what it was before; and is then ready to start in search of prey.

At present Satan is preparing to assume a new appearance; when the time has arrived he will apparently possess more power than ever, and will be adorned with a brilliancy which he probably has not had since his fall. The serpent's change just described, is clearly a type of the *undying* transformations of evil spirits. It is not a passage to a higher life like the metamorphoses of Insects.

Snakes may be charmed, their fangs taken away, and thus rendered harmless—a type of man over whom Satan reigns no longer.

The sea-snakes (*Hydradæ*) infest the Molucca islands and are much dreaded by the fishermen, who consider their bite certain death. They often catch them in their nets, and when taken out of the water they speedily die. They have broad flat tails, which act as a sculling oar, to propel them at a rapid rate through the water. At present they are the only representatives of "the Great Sea Serpent" which have been examined by man, for it has not fully come into view.

The Amphibia is the last great order of reptiles, and varies in form and habits from the Cæcilia, which burrow like worms through the mud, and swim with facility in the water like eels, —to the frogs and salamanders. These Cæcilia somewhat resemble blind-worms in shape, and are found in South America, Ceylon and India.

The spawn of the Bactrians or frog genus resembles that of fishes or the eggs of Mollusca, and is somewhat like jelly. When hatched they assume a form like the early stage of a fish, and at first have tufts or Branchiæ on each side of the neck. These separate oxygen from the air, which is held in solution in the water they inhabit. Small supports enable the tadpole, which has hardly yet assumed this shape, to cling to stones and plants, for even its lips are not as yet developed. Gradually the Branchiæ disappear, and are replaced by gills like those of fishes. Hind legs at last make their appearance, but the creature is still a tadpole. It is ravenous, and grows rapidly; then four legs appear; and as the lungs are gradually developed the gills disappear, and at last the tail shrinks and is lost. The frog now leaps among the herbage, a small but perfect animal.

There is analogy between the progressive development of each class of animals towards maturity, and the history of the extension and growth of powers and forces in the Moral world.

The frog's spawn, and young tadpoles are much eaten by the newt, the near ally of the perfect frog. This is typical of the embryo nation, which is cast like the spawn of a great frog, to be exposed to be devoured by powerful enemies. Nations in their juvenile state of helplessness, are often "attacked by those who from their similar habits, might be expected to pity them." The next is the fishy stage, the first of motion, like the nation's earliest child-life. The mouth of the frog is not yet developed, like the language of the nation which has not copiousness.

The frog continues to grow until it fully enters the tadpole state. The head is large, and commands every part. In this state where the head is the most prominent feature in the animal, we see an analogy with the Celtic Gauls, who were more inclined to centralized power than the other tribes inhabiting France. The tadpole acquires feet as its head becomes smaller, which is analogous to the period of French history when the Franks got a footing in the country. Less was then dependent on the head of the government than in the days of the Gauls.

The *tail of the frog* shrinks in and is lost, but still we see where it was; which is analogous with the indistinct remains of the early history of the nation, and its traditions, which like the tails of animals *point back*. It was not until these traditions

were greatly forgotten, that France reached the summit of her glory. The French frog was perfect two centuries ago, but it was not full grown until the days of Napoleon first, when it swelled and puffed greatly beyond its natural limits. The head was in France; a fore leg in Germany and Russia; one was in the Peninsula; a hind leg was in Italy and Egypt, and another reached to the north of Africa. But when it swelled in Defiance of "John Bull,"—*rana rupta.*

There are three common species of frog in Europe, of which our vulgar frog (*R. temporaria*) is the best known to us. But the green or edible frog (*R. esculenta*) is the largest species. It is a voracious animal, seizing and devouring young birds, mice and insects. It is common in France but rare in Britain. The third is the fire-frog (*Bombignata igneus*) which does not exist in England. It attacks the small fish which swim in the European ponds.

We consider those different species of frogs, illustrative of the French character at various stages of their history.

The French are vulgarly supposed by the English, to be somewhat *long-faced* and *lantern-jawed,* ill set in the legs, but active and excellent "at hopping;" lively and sportive. These are some of the qualities and personal characteristics of our common frog.

The second or edible frog, may illustrate the French as possessed by "utilitarian views," which are so much cultivated at present, but which like this voracious frog may destroy what is of more value.

All the frogs are remarkably glossy and polished, and the French nation is fond of what is brilliant and highly varnished. FRENCH POLISH IS A TRUISM.

The fire-frog reputed venomous, may represent the flashy, "fire-eating," bloodthirsty propensities of the nation, which cause so many of the smaller states of Europe to tremble.

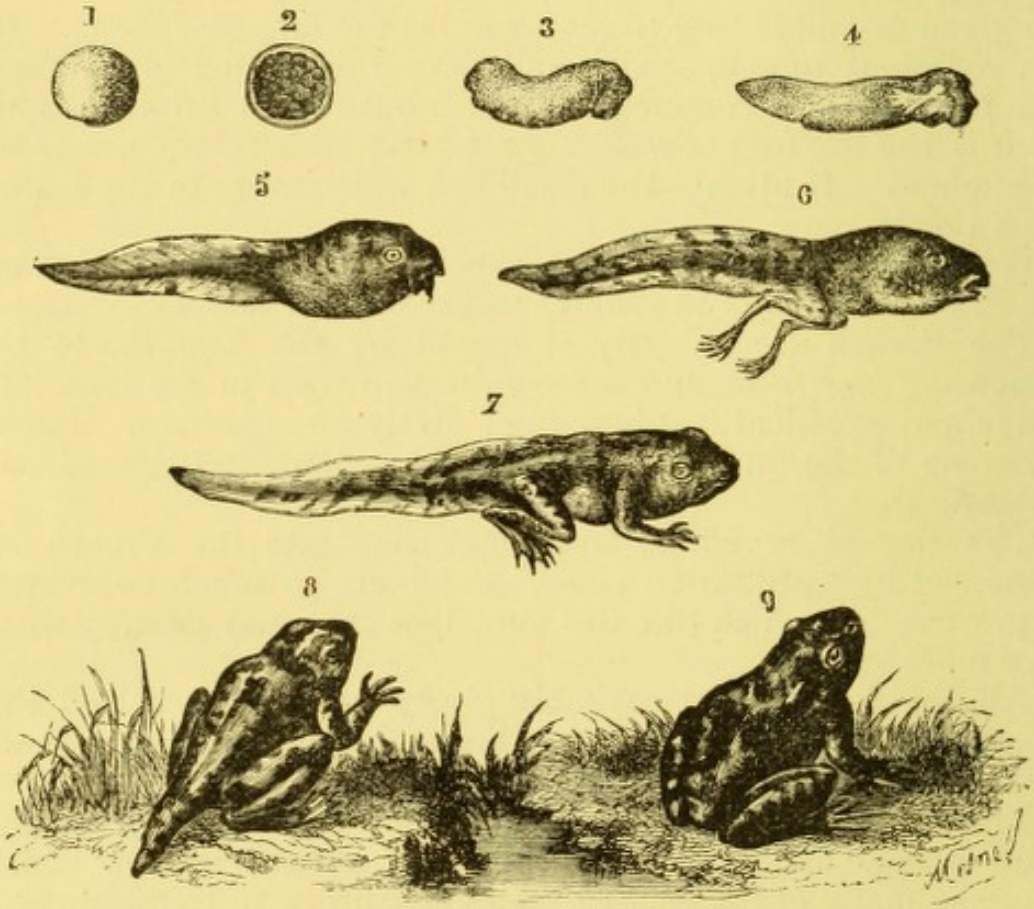
Lastly writers on prophecy like Mr. Elliott in his "Horæ Apocalypticæ," tell us that there were at one time three frogs on the shield of the arms of France, which he thinks has reference to the "three unclean spirits *like frogs*" mentioned in Revelation xvi. 13, which "Came out of the mouth of the Dragon, out of the mouth of the Beast and out of the mouth of the False Prophet."

The bull-frog (*Rana mugiens,* Catesby) is one of the largest of its kind and has a harsh bovine voice, which to the ignorant sounds as terrible as that of a bull. It is common in the United States where it is heard at most seasons, but its bravery is less than its "brass;" it is however difficult to keep within due limits. It is carnivorous, devouring fish, mollusca and

young ducks, which latter in England are stronger than the frogs.

In America, frogs are less famous for their Sportive than for their Grasping qualities, which they carry to a greater extent than do the French frogs. They may illustrate the more noisy traits of Yankee character, which so often bring the nation into disrepute.

The tree-frog of Europe (*Hyla arborea*) belongs to quite a distinct genus, approaching the geckos and chameleons. They



DEVELOPMENT OF THE FROG.

1, Spawn. 2, Spawn fecundated. 3, First stage of the tadpole. 4, Tadpole showing branchiæ. 5, The perfect tadpole. 6, First appearance of the feet. 7, The appearance of four feet and suppression of branchiæ. 8, Frog retaining the tail. 9, The perfect frog.

are beautiful creatures, remarkable for their agile movements among the leaves and shrubs. Their structure permits them to walk with ease on the under side of leaves, and to spring on their prey with extraordinary rapidity; which consists of flies and little insects alighting on the leaves.

The farther we proceed south in Europe, as a general rule, the smaller and lighter is the population physically, and the more given to pleasure. We refer to the Celts and Semi-Celts in Germany, France and Italy.

The common toad (*Bufo vulgaris*) has been much reviled as a poisonous creature, and certainly the moisture exuding from the glands in its back and sides, is a somewhat corrosive liquid, poisonous to animals and not wholesome to man. They are humble and generally inoffensive reptiles, which crawl along at a slow rate and pick up slugs and other injurious creatures in our gardens.

Those men who flatter others in an obsequious manner are called "toadies," from the analogy they show with the habit the toad has of licking the slime of the slug. Human "Toadies" frequently possess disagreeable or injurious qualities, which do not however injure the more noble specimens of humanity.—The toad is only dangerous to the smaller and inferior animals.

The pipa (*Bufo pipa*) of Surinam is an awkward, grotesque animal; far exceeding our common toad in size and ugly uncouthness. It is one of the most wonderful of known animals. It is now well ascertained that the female spawn is spread by the male on her back, and is received there into little cells, in which the transformations take place; when the young escape as small but perfect toads.

The Carib aborigines of South America, refuse to share with the female, the labour of providing for the young, giving themselves over to hunting and war. On the back of the mother is thus put the burden, which some even of the lower classes of animals, do not devolve entirely on her.

The newts or tritons are abundant in stagnant pools, over which they rule with tyrannical ferocity, driving before them the small water insects and sticklebacks. They are mostly confined to stagnant water or slowly running streams, where the decomposing vegetable matter, attracts numbers of aquatic insects and mollusca. The tadpoles of the frogs form a considerable portion of their food. Their transformations resemble those of frogs. The males during the breeding season, acquire a crest and more brilliant colours. In their ferocity and ill temper they equal the crocodile.

This creature is a type of the destroying influence of demons, which are less dreaded in these northern countries than in the south; but they nevertheless exist, and only want an opportunity to display their powers.

The salamander (*Salamandra maculosa*) has been for ages the subject of incorrect observation and superstition. This animal was said to be capable of resisting fire, which is to a certain extent true, for it has been known to rush into a fire-place, remain for a few seconds in the hottest part, and come out alive and uninjured. It is provided with numerous glands, which secrete a liquid of a saline character, a bad conductor

of heat, which acting like a solution of borax or alum, preserves its skin from the rapid influence of the fire. This with the cold-blooded nature of the creature, enables it for a few seconds to resist an active flame, which would immediately destroy the life of a small mammal, bird or insect.

It is a little animal, black with yellow spots of a longitudinal shape; which significant colours, those of light and darkness, doubtless assisted in fostering the prejudices with which it was regarded. These were partly founded on fact, for its skin is highly poisonous, and small animals cannot eat it without injury or death, or even with impunity what is defiled with its secretion. The salamander is a true reptile and is typical of light and darkness. It thus represents degraded power, which not content with destroying its prey, poisons what it cannot feed on.

The salamanders of Europe are small and insignificant compared with those of Japan, as the natives of that country are superior to those of Europe in the strength of their superstitions, and the whole-souled manner in which they are given to idolatry. In China they openly worship "The Dragon," illustrating the degrading character of their belief. With some of us he is a fabled monster not to be believed in altogether; "a bugbear founded on fact;" but with the Chinese he is an Adored Entity.

The salamander of Japan (*Sieboldia maximinia*) is by far the most gigantic of recent Amphibia, and is cruel and savage in its attacks on fish and aquatic animals. Its appearance is sufficiently hideous to deter most Europeans from trifling with it. Its shape resembles that of a much flattened European salamander, with the loathsome aspect of the toad.

What hideous monsters vice and superstitious idolatry are to those who are not enslaved by them! The religion of Japan, is not enhanced in value by the civilization, that accompanies it, which like the small eyes of this great reptile, only direct it how to ensure its prey.

The *Proteus anguinus*, is a creature of everlasting night, dwelling in the subterranean recesses of caverns, in the dark, deep lakes, where few fish exist. Its eyes are in a rudimentary state, but suitable to its life. It breathes both by lungs and gills, like the tadpole and fish in one. It resembles the eel in shape, but has feet somewhat like the newt, and lives on minute Infusoria and ova of fish.

These creatures are the only remaining representatives of the fish-lizards, once so gigantic and powerful, and that played a most prominent part in the prehistoric fauna of our globe. Kirby thinks that these gigantic Saurians may still exist in the interior

of the Earth. These extinct dragons are typical of the greater power possessed by Satan in former ages. The proteus of the ancients assumed many forms; that of our days is the important link between two distinct classes. It inhabits the country of the Slavonian race, and may illustrate their qualities of mind, which show a *protean* power of adaptation to circumstances, savage or civilized life, such as characterizes races, which are either real or apparent hybrids.

The lepidosiren or mud-fish (*L. annectans*, Owen), is a *fish* approaching the *reptile*. Before the dry season they bury themselves in the mud, which consolidates round them in a hard cake. The creature inside forms a sort of cocoon with leaves and mucus, round its body, in which it remains in a state of torpor, until the flush of water during the following wet season, softens the mud, and the animal at once awakes to activity.

The nations of the Gambia are more ferocious and cruel than those of some other districts in Africa; but are more intelligent and independent; thus showing analogy to races higher in some qualities; though they resemble the most savage tribes in their want of tenderness and compassion.

The lepidosiren when hungry, devours its own species. It is an inhabitant of the great river Gambia.

CHAPTER VIII.

THE POETRY OF BIRD-LIFE.

BIRD-ISLANDS—VULTURES—EAGLES—OSPREY—HAWKS—OWLS—SHRIKES—FLY-CATCHERS—THRUSHES—NIGHTINGALE—WARBLERS—WRENS—WAGTAILS—BUNTINGS—FINCHES—CROSSBILL—STARLING—BOWER-BIRD—CROWS—MAGPIE—LYRE-BIRD—UMBRELLA-BIRD—WAXWING—BIRDS OF PARADISE—HUMMING-BIRDS—WOODPECKERS—WRYNECKS—HOOPOE—NUTHATCH—CUCKOO—ROLLER—BEE-EATER—KINGFISHER.

BIRDS amongst Vertebrata, are second in number of species to fishes. It is supposed there are about eight thousand species or "races" of birds, now existing on the globe. They possess greater powers of flight than other back-boned animals. Bats fly, fishes and squirrels attempt it; but their structure does not enable them to soar high; like man's upward spring in his present state. Some flights are dark and bat-like; appropriate to the gloomy caves by day, or the benighted mind when it sleeps.

Insects the creatures of summer days, flutter in the sunbeams, and seldom reach the clouds. They cannot fly like birds, and sometimes helplessly "the sport of winds," are carried far out to sea and perish. Skirting the crests of mountains, they attain great heights, but stop to rest on flowers, which make the way pleasant. Yet their flights—always short-lived, are illustrative of the character of the happy hours of many persons; who only enjoy life when summer-like prosperity shines.

Flying-fish and reptiles pursued by their enemies, start into the air but for a moment. Their flights remind us of the efforts man makes to rise above what surrounds him on earth, and of short-lived human fame.

The flights of quadrupeds, reptiles and fishes, variously illustrate what is gloomy and cheerful in man's aspirations. That of bats, typifies what is most dismal in his expectations. They repose in dark corners during the day, and only flit at night. The flight of the little dragon of the Eastern Archipelago, cannot be called much more cheering. That of the squirrels and flying-opossums is more pleasing; but still not typical of long-continued lofty aspirations.

Aeronauts by their ingenious mechanical inventions, are enabled to raise themselves above their fellows. It is but for a short time they attain their lofty height; they cannot long support themselves in the air; but soon sink to the ground from whence they rose.

> But birds can cleave the clouds!
> And in their eyes bring down the fulmen!
> Divide the wave and feel the coral's breath.

Such are glorious creatures:—

> "Join voices all ye living souls; ye birds
> That winging up to heaven's gate ascend,
> Bear on your wings, and in your notes His praise."

Birds possess sight surpassing that of any other class of animals. When at a lofty height, the eyes of many survey much that is passing in the world beneath; typical of spiritual intelligences, whose vision is more extensive than that of man.

Some birds like eagles and falcons, are noble in aspect and feed on living prey; and are illustrative of messengers of power and vengeance. Others with a sinister expression, that feed on carrion, are typical of evil agents, whose very breath is corrupt. And some like the dove are sweet and innocent in appearance, and have thus been often accepted as messengers or emblems of peace.

No class of animals is found in so great a variety of places as birds. Where no quadrupeds but seals exist, in the far distant, gloomy, Antarctic regions; where no terrestrial animal lives, they fly and fish; for their rapid powers of motion enable them to leave the country, when the change of season cuts short the supply of food.

Although most birds fly, a few genera are incapable of raising themselves from the ground; yet have some compensation for this defect in being better divers and swimmers, or faster runners than other birds. Some of the *impennis* species in their day, even are masters in the land where they live.

A coral reef rises from the waves; its earliest inhabitants are birds, whose guano contributes to form the soil, in which the first land-plants grow. They are humble weeds, but are succeeded by stately cocoas, which attract rain to the little islet. A home is at length prepared for man, who induced to settle there, covers the island with his habitations, now become the abode of a thriving and lively population who well-nigh extirpate the sea-fowl, and rooting up the weeds, replace them by esculents suited to the wants of Man.

A corrupt state of morals, like the neglect of sanitary laws, saps the foundations of the prosperity of the island. Its human population disappears, and their huts fall into ruin. The reign

of the birds returns, and the weeds regain their ascendancy. In like manner the inhabitants of the great cities of ancient days, as they enlarged their boundaries, drove away the animal tenants of the marsh, which was converted into a garden. Such was the case with the neighbourhood of Babel, which in its desolation was revisited by "unclean and hateful birds," that had no place in its precincts in the days of its prosperity.

Most naturalists are agreed in placing the vultures first amongst birds; and if strength, size and a dignified aspect give this preference, they are surely entitled to it. The birds of prey are eminently illustrative of the different ranks in society. The falcons are more generous, courageous and gracefully formed than eagles or vultures; but are inferior in size. Princes who are not crowned heads, have often higher qualities, than those who sit on a throne. The eagles much larger and more powerful than falcons, typify kings, who are more influential than princes.

Most of these birds of prey, build on lofty eminences, from whence they survey the smaller birds as from a throne. The vultures see farther, and having the most stupendous power of wing, soar higher than all other birds of prey.

They are types of Emperors such as rule Russia, and who have sometimes ruled over large sections of the Earth. Like vultures they delight in slaughter, and are faithful attendants on death and dismemberment. Vultures seemed formed principally for an uncivilized state of society, and "to commune with rugged Nature." They have no place in an English landscape; although the Egyptian and griffon vultures, who have each visited our land, seem to typify the more rapacious among our rulers. Such were William the Conqueror; and the devourer of the dismembered and confiscated Abbey lands;—HENRY the EIGHTH.

Africa is the great stronghold of vultures, and as a rule cruelty and brutality have reigned almost throughout that land; where every kingdom is as it were *a carcase*, and *a prey*.

Four vultures breed in Europe, and appear to typify the four great monarchies of the world.

The Cinereus vulture (*V. cinereus*) is not the largest; but yet is one of the rulers of the East among the birds of prey. It exercises more influence in Palestine and Syria than some other species, which are more European in their range. Such a bird is a type of the old Babylonish Empire.

The Egyptian vulture (*Cathartes percnopterus*) is more widely distributed than the preceding, being found from "India even unto Ethiopia," as well as in Europe. As a bird of brighter colours than the other vultures, it may represent the gorgeous Medo-Persian Empire.

The griffon vulture (*V. fulvus*) is a larger and more powerful bird than those we have just described, and being more characteristic of Europe and especially of Greece, may typify the Empire of Alexander the Great.

The *Lammergëyer* (*Gypaëtos barbatus*) is the most powerful and majestic of all these vultures; and in the form of its wings and claws is like the falcons. In ferocity and strength, it far surpasses any bird of prey on the old continent. They have become scarcer as civilization has progressed; yet they still exist, and should it droop, these ravenous birds may again congregate. If the Grecian Empire is typified by the griffon, that of Rome is illustrated by the *Lammergëyer*, which was so much more powerful, and like this bird, attacked its prey during its life and vigour.

The Sociable vulture (*V. auricularis*) a doubtful native of Europe, lives in *communities*. It is a type of the Socialists, who it is to be hoped will never rule in Europe.

We survey the four European vultures again. Eagles have a place in the arms of France, Russia, Austria and Prussia. Vultures would be more appropriate emblems for these governments.

The *Lammergëyer*, reminds us of the French Empire, as it combines the courage of the hawk, with the power of attaining a great elevation. This bird endeavours to drive weak animals over the rocks, and when their bones are broken, feasts on the carcase. In this it shows analogy with the policy of some Imperial rulers, who endeavour to induce those on whom they desire to prey, to *ruin* themselves. These birds are capable of swallowing an enormous quantity of flesh, and when thus gorged are an easy prey; which shows some analogy with the state of plethora of the late French Empire, whose *very great size* rendered it more easy of attack.

The other vultures feed on carrion, or only prey on what is at its last gasp; while this prefers living prey; typical of the different mode of warfare, pursued by the French and Russian Empires.

The condor (*Sarcoramphus griphus*) soars higher and farther, than any vultures of the Old world. Its range extends along the Andes and Cordilleras, which form the so-called "backbone of South America." And well does this giant bird, pick the bones of the carrion of these regions. The land it inhabits, abounds in the grandest scenery in the world, and yet produces little that the moralist can admire.

The land is magnificent and the country imperial, but the people are carrion, and the rulers vultures; and they do not even possess the courage and vigour of their analogues in Europe.

The Incas of Peru and their successors the Spaniards, were surely more admirable than the mongrel Republics that have followed. They were as superior to them, as the condors are to the commonplace Perchers and Runners of the plains.

The condor is an emblem of great empires which have passed away. As it soars to the summit of Chimborazo, it is a type of the elevation to which Ecuador and Peru might attain, in the hands of a vigorous and industrious population.

The turkey buzzard (*Cathartes aura*), we consider to illustrate the character of most of the Republics of South America. It is a cowardly, mean, and *dirty*, but cruel and rapacious bird. It flies craven from the king of the vultures (*C. papa*); it quakes before the giant condor, who himself is held in awe by the smaller yet more courageous harpy eagle; which is a type of the rising Brazilian empire, that excites the disgust and dread of the republican divisions of that continent.

The secretary eagle (*Serpentarius cristatus*) attacks the most venomous serpents of Africa, and is found so useful in that country, as a means of lessening the numbers of species noxious to man, that it has been introduced into the West Indies for a similar purpose, with complete success. The maintenance of the balance in creation, is necessary to its well-being. A country must be greatly disordered, when it cannot rid itself of what is noxious and hurtful, without external aid.

The secretary eagle is a type of emigrants, who carry with them, the means of the extirpation of the vices in the land where they settle.

The eagles are powerful birds, and as a rule illustrate regal state. The imperial eagle (*Aquila imperialis*), does not live within the British isles. We have not had an emperor among us since the days of the Romans. But these birds are found in Algeria, Turkey and Russia; yet they are smaller than our golden eagle (*Falco chrysaëtos*), which is more generally known and admired. Continental writers say the imperial eagle is the finest bird. It is perhaps doubtful which species was referred to by ancient authors, as the emblem of Rome. The vulture, is the type of the supreme power of Rome; but the eagle is the emblem under which their legions fought. It still typifies in the provinces that were once Roman—the hand that holds the sceptre.

We have to thank Germany for our present royal dynasty; who however were descended from the ancient Scottish kings; perhaps typified by the German spotted and golden eagles; alike now considered British.

Let us cast our eyes on Scotland, the home of the eagles and the Stuarts.

In one of the mountainous parts of our island, the true lover of nature hears a wild cry through the sharp frosty air, and beholds "a speck on the sky" descend as a noble golden eagle. The scene is in Perthshire, in a lonely glen or chasm, in hills of mountain limestone; to which a lofty waterfall obstructs the entrance. At risk of life and limb the naturalist creeps along a narrow ledge of rock, holding his breath, and enters a glen surrounded by cliffs three hundred feet high. There is no vegetation on the rocky sides; not a Scotch fir-tree, not a sprig of heather or broom; but a wild wood of dark firs with much heath and broom fills up the bottom of the glen, peopled by the fox, the hare, the raven, the red grouse; and among the smaller birds, the crossbill and the crested tit.

Over this animated domain a pair of eagles reign, the king and queen of all the neighbourhood. This little world is nearly complete in itself. No intruder has for ages disturbed *the sacred bird's rule:* an Inheritance older than the Norman rule; before Graeme broke down the Roman wall; or the days of Ossian. Their ancestors have seen King Edward's conquests, have feasted at Flodden Field and at Culloden! They shriek and fly as man approaches, an intruder on their domain. Their eyrie is on an inaccessible rock, but it can be seen from a higher point with a powerful telescope. Their nest is a vast structure, materials accumulated through many years; but it is not tenanted yet; the winter season is not passed, yet still the birds perch near it, in hope of the dawn of the spring. The eagles not fearing man hover near the stranger, as if threatening him for his intrusion. The grand birds soar away. He wishes he could command the air as they do.

He returns a month hence.—No eagle greets him with its piercing shriek! He wanders through the valley, and hears nothing but the croak of the raven, or the rustle of the timid hare. He sees the ravens fly close to the bottom of the cliff, on the top of which the eagles built their nest. There an eagle lies stretched on its back, and a raven stands on its corpse, picking out "Those eyes that stood undazzled in the Sun." "He was the Sultan of the Skies, and Earth paid tribute to his Eyrie." But now!—"Imperial Cæsar dead, and turned to clay"!!

The raven would not have dared to have touched the eagle during its life; but now it croaks in gloomy mirth over its carcase. A spirit which reminds us of the coarse levity with which some persons treat the mighty dead. Their envious eyes, like ravens or greedy carrion crows, lust for the gory death of those who rule. Such we fear would sacrifice all that is beautiful and worthy of being remembered in history; all that the noblest

of us admire in the present day; all our glowing hope of an active and brilliant future, on a profaned altar, miscalled that of "PROGRESS;" in truth one of human bones on a foundation of ruin and decay. The sound theory of progress, accepts every blessing as an earnest of a greater one to come; and hopes that every present possession, may yet be developed and EXTENDED, RATHER THAN DESTROYED.

The different inhabitants of the glen which we have above described, and the eagle rulers themselves, we have compared with a Kingdom. Britain had Kings and Chiefs, before the appearance of Cæsar, and if Her civilization did not reach the Roman *altitude*, still Her inhabitants were highly cultivated compared with the *really barbarous* nations of the nineteenth century. The British eagles typified Caractacus and Boadicea. The savages of remote regions of the earth, with whom some Ethnologists are quite willing to class our ancestors, are indeed primitive and rude in their habits. If we seek for types of men in birds, we can only compare the savages of the North, with the puffin and the guillemot; and those in the South with the penguins.

The white-tailed sea eagle (*Aquila albicilla*) often breeds on the cliffs within view of the sea; and lives on fish, or on any prey it can get either alive or dead.

The "Sea Kings" of Norway were eminent fishers, and like this bird were bold and courageous and ruled over the less vigorous "*Ichthyophagi*," as these eagles do over the gulls and puffins.

The osprey (*Pandion haliætus*) which lives exclusively on fish, is nearly extinct in these islands. It is a smaller and less noble bird, than the golden or white-tailed eagles. It is a type of the remnants of the Finnic population of the British Isles, who were so devoted to a fish diet: from all we know of them, they appear to have been a quiet race of little enterprise compared with the prototypes of the *true* eagles.

The spotted eagle (*Aquila nævia*) is a much smaller and more insignificant species than the preceding, and feeds greatly on insects, toads and other vermin, and is thought by many "a vermin" itself. Yet it belongs to the noble eagle class; which is seen instantly, when it is compared with the buzzard. It has far more spirit and courage than that bird; and is perhaps for its size, not inferior in this respect to the larger eagles.

We consider this species, typical of the princes of Germany, allied to our royal family.

The falcons are a magnificent division of birds; for they exceed all other birds of prey in grace, high spirit, harmony of colour, penetrating glance and refined aspect. Their gentleness

in captivity is not less than their courage; and they are in a high degree susceptible of education. We may search the whole avifauna in vain, to find birds which equal them in attractive qualities. We consider them a type of nobility, who from ancient times have been the attendants of royalty. They like the falcons, are different in degree of rank as well as of character.

There are three species or races of jer falcon, which stand at the head of their order for size and beauty: for when trained by the falconer they are a match for the largest game birds, such as the heron, the bustard and the goose. The various falcons according to ancient writers on the "noble sport," were appropriated to different ranks in society. Thus the eagle, merlin and vulture, belong to the Emperor. The jer tercel to the King; the gentil falcon or goshawk to the Prince; the sparrow hawk to the Priest; and the kestrel to the Servant.

The jer falcon may well wait on the king, its strength and beauty rendering it so noble in aspect. Those who are *high* in rank, wait on those still Higher.

The jer falcons are "flown at" large birds, hares and other small quadrupeds, which they kill by striking their talons into their brains. The most highly trained hawks, do not kill their prey, but bring it down alive to their masters. These accomplished birds, typify those individuals who unite High birth with fine qualities; and with the aid of natural and acquired gifts, attain a lofty position. They soar as it were like these birds, and "bring down applause from the very skies they pierce and break."

The peregrine (*Falco peregrinus*, Linn.) true to its name, is a wandering bird, and has all the fine qualities of the other species; but is even more gentle and easily managed than the jer. It too is "flown at" herons, ducks and other large birds, which it pursues with the ardour common to all the genus. This activity is typical of the energy which many of our Nobility display; who also like the peregrine visit most countries of the world. Many Englishmen, like swallows, migrate at certain seasons of the year; and like the sea gulls are at home on the waters.

The merlin (*F. æsalon*, Tem.) was in the medieval times appropriated to emperors, and from its graceful motions, beautiful markings, spirit and activity, may in truth remind us of a page of noble birth, in attendance on a "King of Kings."

The orange-legged falcon (*F. rufipes*, Bech.) is a beautiful little species. It is rarely found in the British isles, and typifies a gentleman in waiting or a nobleman at court; it having the grace and attractive qualities of those of higher rank, with-

out their power. The orange-legged falcon has not as much spirit as the merlin.

The kestrel (*F. tinnunculus*) is a fine bird, although its commonness renders it less valued. It is not so courageous as the hobby or the merlin, and is less noble in its prey, being more devoted to an insectivorous diet. It was appropriated to the servant in the palmy days of falconry. It is perhaps a type of the ruined gentleman, who is compelled to take a menial's place.

The sparrow hawk (*Aster nisus*) is a prettily-marked bird; dark on the back and light on the breast in accordance with the costume of the priest, to whom it was formerly assigned. It is by no means a contemptible bird when trained for the field, but does not show the elevated spirit of a true falcon, as it belongs to a lower class.

The goshawk or gentil falcon (*Aster palumbarius*), although belonging to this inferior family, yet is so courageous, docile and graceful, that it has always been one of the most esteemed species for the chase. It possesses great strength, and in this respect nearly equals the peregrine.

It may be a type of the private gentleman, who has risen to the rank of a nobleman and personal attendant on the king or prince.

The buzzard (*Buteo vulgaris*), appears a coarse and vulgar bird when contrasted with the falcons; and it is a type of the man of low birth and coarse manners.

This bird resembles in character a bully of the lower class. It shows a willingness to fight a little merlin, which is less than half its size. But the little bird boldly coming to meet the *giant;* the latter is seized with terror and does not wait its approach. The buzzard is ignoble also in its diet, feeding much on insects, frogs, toads, lizards, mice and the young of small birds; those even as large as the partridge, it is afraid to attack, for fear of the mother.

The honey buzzard (*Pernis apivornis*) is the most exclusively insectivorous of the birds of prey, but it will occasionally eat reptiles and young birds. Its common prey however consists of insects of the hymenopterous order, to which it is very destructive; some hundred nests of bees and wasps being probably destroyed by one bird in a single season. It is as cowardly in disposition as the common buzzard; but is more elegantly shaped and richly coloured.

The honey buzzard is typical of the well-dressed thief, who entering the garden in the guise of a visitor decamps with the bees. The arts and devices of thieves, are sometimes useful to the honest members of the community. This bird plays a

similar part, when it destroys the nests of those robbers of the orchard,—the wasps.

The kite (*Milvus regalis*) like many petty oriental sultans, is regal only in name ; and as they often are, is handsome and graceful, but treacherous and cruel to those who are in their power. The kite although possessed of much greater strength, yet fears to attack the hen, whose chickens in an unguarded moment, have come within reach of its claws. A timid mother when outraged by the loss or danger of her young, becomes fiercer than a beast of prey.

Again the kite is like a robbing Turcoman tribe, who cunningly approaches to capture those straggling from the caravan ; but when perceived and chased, flies.

The harriers (*Circus*) are so called from their habit of beating the covers for game, like dogs. They are a genus very destructive to young birds, in the moorlands and marshes. They are slow, but easy and powerful in flight, and are very courageous, being ready to attack and kill full-grown pheasants and partridges.

They are a type of those who show great vigilance and perseverance in discovering an enemy, as well as equal determination and dash in assault. The Celtic-Scandinavians have this combination of qualities, and produce the best light troops in the world.

The owls are all birds of prey, but in Britain, only the smaller species have those nocturnal habits, which are popularly considered characteristic of the genus. They have been justly said to resemble the feline race amongst quadrupeds, the smaller species of which are also more crepuscular than the larger.

The owls which are soft in their plumage, stealthy and noiseless in flight, remind us of smooth-furred quiet-moving cats, which have also fierce eyes and very great strength and elasticity of form, in proportion to weight. Both have sharp claws, which they use with great effect to tear their prey.

The eagle owl (*Strix bubo*) is a truly formidable looking bird, having the ferocious aspect of the owl, with the size of the eagle.

If the eagle amongst birds, represents the lion amongst beasts, so the eagle owl does the tiger ; for scorning the nocturnal habits of its smaller relatives, it attacks its prey in the daytime. This species when annoyed barks like a dog.

Minerva the goddess of wisdom, war and the liberal arts ; according to classic mythology was produced from Jupiter's brain without a mother. The owl was sacred to her, and has been " the bird of wisdom " ever since.*

* The bird of Minerva Mr. Tristram thinks to be Athene meridionalis. "Land of Israel," p. 67.

There is a certain staid and venerable aspect about the owl, which inspires respect and dread, in the superstitious who hear its note. As it hoots from the desolate tower, melancholy sensations rise in the listener; for the mouldering glories of a past age, start into remembrance. The green ivy illustrates what they once were;—the "moping owl," the grief which man feels on the decay of greatness.

The owls as a class, typify the House of Peers, and the eagle owl has been compared with the representative of that body, the Lord Chancellor, from the mixture of gravity, sternness and vigour in its deportment.—This bird is called by the French the "*Grand Duc.*"

The owl can punish with hardly any effort, the contumacy of smaller birds, and can dart upon aggressors like an arrow tipped with "grey goose-quill;" which we may liken to a mandate of the Court of Chancery.

The brown owl (*Strix ulula*) appears small after the eagle owl, and is common if not abundant in the woody districts of England. Its voice is louder and more doleful than that of any British species, and in the ears of the superstitious, sounds like the mutterings of an evil spirit. It is less beautiful than some of its tribe, being exceedingly stout and clumsy in external appearance, in which it exceeds almost every bird of the robust family to which it belongs. Its habits also are less noble, than those of the larger species.

We see analogy between it and some of the inferior Peers; who by success in farming, fisheries and county jobberies, manage to elevate themselves from the position of country gentlemen, to that of members of the Upper House. They are useful to society, but are surely not in the first rank even of the Barons.

The white owl (*Strix flammea*) is typical of a still humbler member of the house of Lords; one who has made money by *cotton*, and cannot leave off his cotton robe. This species of owl, shows much that is downy and cotton-like in plumage; and its back is marked like a "chaste" popular print.

The snowy owl (*S. nyctea*) is a noble creature indeed, but scarce among us. It is beautifully marked and graceful, and typifies our choice Scandinavian Peers, whose ancestors early migrated from the frozen north.

The snowy owls vary in tint, some being whiter than others. The brown bars with which they are all more or less marked, typify the popular or earthy sympathies of their prototypes, which vary so much in degree.

These birds' feet are beautifully feathered, and their touch is light; but their claws are sharp, and timorous hares are caught

by them for food. These habits illustrate the sporting tendencies of the English nobility.

The House of Peers like many of the owls, is *most lively* at night; being able it is thought, to see into matters best in the dark.

The shrikes (*Lanius*) amongst birds, illustrate the trade of butchers among men. They are as fierce in proportion to their size, as any birds of prey. They mangle small birds, mice and insects, and impale them on thorns for use, as butchers do their meat on skewers.

From the lofty and elevated falcons and owls, the descent to the shrikes, is very great and abrupt. They are connecting links between the great birds of prey and the insectivorous and omnivorous birds, called by Linnæus, Passeres. There is more of every-day life about them, than about the great families; which are the *aristocracy* of bird life. The shrikes have the air of true *Bourgeois* and display the petty vices of such. They are however pretty birds.

The grey shrike (*L. excubitor*) is a *blue-backed* bird, and may be likened to the butcher's boy in his blouse; while the red-backed shrike (*L. collurio*), may remind us of him, after his work is done.

The flycatchers (*Muscicapidæ*) have a large bill. Their French synonym *gobemouche*, is applied to those who show great facility in believing that class of stories which are "told to the marines." These tales are like the flies which the "*Gobemouche*" catches and swallows so readily. The blue-bottle flies that buzz round our heads, are like the tales that amuse those who have a moderate share of credulity, but are "literally devoured" by the persons to whom we have referred. The incredulous turn from them with distaste.

Two species of flycatchers are found in Great Britain. The spotted flycatcher (*Muscicapa grisola*) is by far the largest and most abundant British species. It builds a neat, mossy nest, which it places in a hollow tree, or often wherever a resting place can be found.

The true *gobemouche* among men, is easy in his mode of life, and can make himself at home in a great variety of localities; such as even at the angle of a lamp-post in a town; where its prototype has been known to build its nest.

The pied flycatcher (*M. luctuosa*) is not abundant in Britain. Were its good qualities for the table as well known to our epicures, as they are to those of Italy, it would stand but a poor chance indeed.

It is a type of credulous individuals, devoted to the pleasures of the table, upon whom a host of smaller epicures live. Like

those who live too exclusively on the birds, they impoverish their supporters; since if they are resolved to *live on them*, it is quite certain they cannot *long* live for them.

The thrushes (*Merulinæ*) with which we commence the singing birds, include some of our best songsters. Mellow, rich-toned singing is heard from them; but not great compass or variety of tone. Their song has a crude, fresh, country sound, reminding us of those persons who have ordinary but melodious

EMERALD BIRD OF PARADISE. Page 222.

voices; not cracked in endeavouring to imitate the more lofty and elevated "Swedish Nightingale."

The song of the missel thrush (*Turdus viscivorus*) has a clear mournful sound, and is heard most loudly on the approach of stormy weather. It is like that of the broken-hearted, who yet sing in mockery of their woe. It also reminds us of the strapping country youth, who in a gloomy evening in February, pours out a mournful, though not inharmonious strain to the cold east wind; as he tends his sheep on the hill-side, skirted by a thick wood.

The voice of the song thrush (*T. musicus*) is one of the most pleasing that we commonly hear. Its melody is both cheerful and sweet, and has just sufficient plaintiveness to move our tenderer feelings without drawing every chord of our affections, and opening every old sore, which time and change of season had healed.

The song of the thrush inspires us with pleasant emotions, for before the winter is passed its strain begins. In like manner a pleasant change may pass over our feelings; for in the midst of trouble our spirits may begin to rise, although the relief has not yet come.

The blackbird (*T. merula*) has a black body and a yellow bill. It is shy, not easily caught, and whistles well, apparently without any effort. Its song in our opinion, is superior in quality to that of the thrush; being richer and having more of the bubbling music of the waterfall.

The blackbird may be compared with a whistling girl, shy and skulking, but withal pleasantly attired in modest black, and with a complexion tinged with saffron.

The golden oriole (*Oriolus galbula*) is a rare visitor to Britain, but breeds abundantly in Italy. It has a round, flute-like voice; exceedingly pleasing and attractive; but the bird is dirty and awkward in its habits in a cage.

It reminds us of the gay Italian operatic singers, who also visit us in spring. With all their excellence in music their habits and morals, are often such as we cannot admire.

The dipper (*Cinclus aquaticus*, Bech.) is a most interesting bird in the localities where it is found, enlivening the mountain streams and pools, by its diving and sporting habits in the water. It makes a large nest somewhat like that of a wren; perhaps within reach of the spray of a mountain waterfall. It has been accused of devouring the ova of the trout and grayling; but careful examination demonstrates that it more frequently feeds on the larvæ of beetles and dragon-flies, which are more destructive to ova than this little bird could be, if it lived entirely on them.

In some of the mountainous parts of our island its song may be heard, where perhaps from the scarcity of wood, no other bird cares to reside. Its strain has a peculiar and unique beauty among the notes of British birds. Heard in its native wilds it is pleasant, like the sound of the bagpipe or an old Gaelic song; but transported from its *home* it affords little pleasure.

The hedge accentor (*Accentor modularis*), one of our commonest birds, is lively in voice and motion although unobtrusive in colouring. Its song is monotonous, but possesses some of

the notes of the skylark. In the aviary it learns easily the notes of other birds, which it mixes up with its own in a confused manner, spoiling both. It sings loudest when quarrelling with one of its companions, in which it reminds us of a tattling female, who picks up stories, but cannot repeat them perfectly; and who raises the tone of her voice, and endeavours to talk down those who oppose her. This class of persons generally hang as it were on the skirts of those they respect, and to whom they are willing to pay the most servile attention.

In like manner the hedge accentor, devotes itself to hatching the egg which the cuckoo—a great bird, lays in its nest. The young cuckoo makes its appearance before the young accentors, and soon turns out of the nest any hatched birds, or eggs, and thus becomes sole ruler.

This episode in bird life, is frequently illustrated in the case of foster children, who are often like the young cuckoo grasping and selfish; and ungrateful at last even to those who have nourished them.

The robin (*Sylvia rubecula*) is supposed to have a certain sympathy with man, which is doubtless the foundation of the friendly feeling, which he so often shows towards the bird; for in summer and in winter, it fears not to approach Man's dwelling. In the warm season it builds in his flower-pots and outhouses, and when the soil is under the iron covenant of "Jack Frost," the bird comes near, in common with pensioners of human kind, to receive the Christmas dole.

If bold with men, it is pugnacious with birds of its own size, which it generally drives before it. Its own species comes in for a share of its attacks, which are mostly desperate, and often end in the death of the weaker robin.

The bird's analogue,—a frank, generous and brave character; walks boldly up to his superiors, but in a conflict with equals fights till death.

From the most ancient times it has been the fashion to admire the nightingale (*Sylvia luscinia*) notwithstanding its dusky plumage. This preference is owing to its song, which far transcends that of any other bird. Tourists go a pilgrimage to hear this bird, just as they do to enjoy the song of some favourite *Cantatrice;* and plain features and obscure costume do not prevent her voice from being admired.

The russet colour of the nightingale is composed of a variety of brilliant hues. Under *the veil of modesty* transcendent merit may be concealed; and glaring colours often deck immorality: yet when we come to dissect this dusky veil we find what is bright and beautiful intermingled. In natural objects it is a rare exception to see great extremes united in one individual, and

in human beings, this is not more frequent. Our most beautiful singers are often unsymmetrically formed, owing to their mental and physical constitutions, presenting great excess and deficiency of development:—such peculiarity accounts for their talents and their defects.

The music of the nightingale is the concentrated beauty of the song of a variety of birds. Its executive power, is equal to the quality of its tone and extent of its scale. It combines the mellow plaintive sweetness of the woodlark, with the sprightliness of the skylark, and the essence of the other warblers of the grove. Its voice is believed to be more *penetrating* than that of any other bird, for it can be heard at the distance of a mile, which is as far as the voice of man can reach. According to the anatomist Hunter, the muscles of its vocal organs are proportionately stronger than those of other birds. The late hour at which it sometimes sings, enhances the effect of its voice; for most birds are then at rest. IT THRILLS THROUGH THE STILL AIR AN EVENING SOLO, TO CONCLUDE THE DAILY CHORUS OF ADORATION WHICH NATURE IN HER BEAUTIFUL AND VARIED LANGUAGE, POURS OUT TO HER CREATOR.

The nightingale as the representative of singing birds, is wisely given the first place. Its song rises to Heaven, in contrast to that of the skylark, which appears to come down from the clouds. The song of the nightingale so admired in Germany, in its variety, sweetness, power and soul-stirring tone, reminds us of German or Scandinavian music; which is elevating and pleasant to hear, and possesses more of an *intellectual* character than the luscious but sensual music of Italy.

Let us consider what birds please us most by their song. Not the birds of prey;—vultures emblems of "world-power;"—falcons of Nobility and Gentry;—owls of Chancellors and Senators; or the other divisions of the great birds, which personify our most influential classes: but these little dusky genera, such as warblers and thrushes, yield the best song.—*Prima donnas* generally originate in *low life*. These little songsters' voices, being louder than those of the great birds, illustrate how what is smallest in size, may produce the greatest effect. The ear, the medium by which sound is conveyed, not being regulated by the same rule as applies to sight.

The black-cap (*S. atricapilla*, Linn.) stands next to the nightingale in beauty of song, which it is said to imitate, and is thus called "the mock nightingale." It greatly exceeds that bird in beauty of plumage, but its song though similar in character is vastly inferior. In Germany it is called the monk, from the black head of the male; while the female has a red head.

If the nightingale represents the *Prima donna*, the black-cap or "mock nightingale," reminds us of the comic singer, who does not possess such high qualities, but is still admirable. In the "comedy of birds," the little black-cap, could play well the part of the friar.

The white-throat (*S. cinerea*, Linn.) an exceedingly graceful bird and a good songster, resembles the nightingale in song and plumage. Being more generally distributed it oftener contributes to our pleasures. If the nightingale resembles the singer with an "Uncommon voice;" the white-throat may be compared with the vocalist who is found in most places with a good ordinary voice. He may be esteemed the "Nightingale" of his district, but is far inferior to the *true bird.*

The reed-warbler (*Salicaria arundinacea*) has an unattractive and singular note, and a sombre plumage; but it has an elegant shape, and is an interesting bird in its habits. It climbs among the reeds, as actively as a mouse to its ingeniously built nest; which is one of the most curious of any British species. It passes the winter in Africa, and the summer in these islands.

It illustrates the quiet dame, who can execute ingenious works, but who has a third-rate voice, which yet finds admirers. She is modest in her attire, and active in her habits. She travels to the south in winter, but enjoys the northern summer.

The migration of birds is very important both as a fact and as a type. Hundreds of species visit various countries at different seasons in search of food, going north in summer, and south in winter. This is eminently the case with the *Anatidæ* or ducks, which find sustenance in the wonderfully rapid development of organic life, occasioned by the great length of the summer days in the Arctic regions. The immense number of insects and mollusca, found in Lapland and other northern countries in summer, accompanied by an equal proportion of birds occasions much astonishment to the visitor. When the cold season approaches, these birds leave Lapland for Southern regions, where the development of organic life, is not so much checked by the approach of winter.

These different migrations remind us of Emigrations amongst human populations; whose movements are also influenced by the supply of food. The roving habits of some quadrupeds, well illustrate those of nomad nations, who do not cross the seas: and the passage of birds, the emigrations of human beings to countries beyond seas. Man *migrates* in his Youth, his "Summer of life" to some Northern country which has great resources, and in his "Winter" having fulfilled "His mission," he returns to the south. Men born in the north though settled in the south, pant for their native air, which they must

respire if they would recruit their strength. In like manner many birds *re-visit* the place of their birth. These different changes from one climate to another, are favourable to the increase in numbers and prosperity of man and animals.

The wren (*Troglodytes europæus*) is found in every country in Europe, and is well known for its small size and activity. It is fond of comfort, and accordingly makes a snug nest, which varies in materials with circumstances; but is always enormously large in proportion to the minute dimensions of the bird. Being exclusively insectivorous, and especially fond of caterpillars, it is of immense benefit to the farmer and gardener; both in summer and winter. In the latter season, although insect life is in many cases dormant, yet the eggs, pupæ, larvæ and imagos of the insect tribe in a state of hybernation, are procurable by the indefatigable wren. It hunts many a nook and cranny of hollow trees, ivy, outhouses and thatched cottages; and in finding there a sustenance for *itself*, increases that of Man.

The wren is a robust and most prolific bird; and is a type of those stout-bodied persons who are "blessed" with large families, but who are like themselves under the ordinary size. They are comfortably cared for in their warm habitations by their industrious parents, and are like the wren eminently beneficial to society.

The more ignorant among the Irish, have a great hatred to the wren, which is one of their best friends, and is like its type the reviled but quiet Saxon settler, too frequently a victim to cruelty or revenge.

The golden-crested wren or kinglet (*Regulus cristatus*) is a little bird of graceful motions, beautiful colouring and pretty form. Its note is weak and monotonous but pleasing, and its habitation is truly the most exquisitely finished of that of any British bird. They have been called "kinglets" on account of their golden crown, but they surely are amongst the smallest and feeblest of birds. Most species that feed on insects are very easily killed on the approach of frosty weather, and both the common and golden-crowned wrens are especially so.

It is not so prolific as the common wren, and is a type of elegant young princesses, who are without much character or power, and are delicate and susceptible, although they wear a golden diadem.

The pied wagtail (*Motacilla Yarrelli*) is a lively species, which frequently crosses our paths as we wander by the water-side, chirping, and wagging its tail. The contrast of colour in this bird, like that of the wheatear, is agreeable to the eye. It is also very useful being almost entirely insectivorous.

It reminds one of a graceful young lady in half mourning, who perhaps wishing to appear sentimental, is in reality on "the look out." She crosses the paths of men she meets, giving at the same time an undulating motion to her skirts, while she turns her head round to look after them; the exact motions which we have frequently observed in this bird.

The little tits (*Parus*) are a small, active, hardy, but lively and amusing class of birds, which exceed all others in fecundity. They possess a great amount of courage, and fly when hungry upon birds a great deal larger than themselves, attacking them and splitting open their heads with their powerful bills, and eating their brains.

They remind us of spirited little dwarfs like the famous Hudson, who was formidable even to those quadruple his size. The Scotch say of the tits, "they have a drop of the Deil's blood in them," to which they attribute their savageness in attack. They have large heads, a peculiarity in common with little men of spirit. Their necks also are very thick, like those of many fathers of large families.

They are interesting birds, from their extreme impudence, for they venture to hiss at man's approach; and bite his fingers when put into the nest. A similar pugnacity is shown by small people in the protection of house and family. They hiss like this little bird, and stand on tiptoe with consequential air.

The song of the titlark or meadow pipit (*Anthus pratensis*, Bech.) is much above the average of singing birds, but is not extreme in any single quality, although varied in tone, and is less powerful than that of any of the lark genus. If the nightingale is "the master" or teacher of song to the more imitative birds; so the titlark is "the junior teacher or mistress of music," its voice being capable of exercising so great a variety of movements, in an ordinary manner.

The skylark (*Alauda arvensis*, Linn.) certainly one of the most agreeable cage-birds, is sought for with great diligence by fowlers. In one respect its song surpasses the nightingale or any other bird, that of *aspiring loftiness of tone*. It is pleasing to watch it soar, singing as it rises on high, until it is lost to human sight. But it cannot leave the Earth from whence its subsistence is derived, or remain long in its high position. Neither can Man when elevated on the wings of his imagination, for he must soon descend again to the dull commonplaces of every-day life.

The great height to which the lark attains, does not prevent it from being devoted in its attention to its young; which it is unwilling to forsake even in time of danger. Parents whose

"aspirations are lofty," are careful to *fulfil* their every-day duties; and most earnestly desire the good of their children.

The woodlark (*A. arborea*, Linn.) has a mournful, sweet and plaintive song, that moves us more than any bird's. Burns compares it with the sighings of a broken-heart, which is not silent in its grief, but pours forth its feelings to be echoed by the woods. Its mellow notes are so like the moanings of wind through reeds and water, that it might well have been sacred to Orpheus.

The common bunting (*Emberiza miliaris*, Linn.) is a clumsy bird, compared with many that we have previously mentioned; being thick-billed and heavy-bodied; and has an unattractive song. It is a shy and rustic looking bird; and its thick body reminds us of an awkward ungainly clown, whom no one admires; but who has just sufficient sense to avoid falling into every trap.

The yellow-hammer (*E. citronella*, Linn.) has a faint resemblance to the canary, but is much larger and more clumsy. Its great abundance makes it little esteemed; otherwise it would be caught, and prized as a cage-bird. From the curious noise it makes, when its eggs are taken, it has been supposed in Scotland to say; "Deil, Deil, Deil, take ye." Its brass-like colour is appropriate to a creature which is the subject of this superstition; false gilding being one of the means of rendering what is otherwise *vile*,—BRILLIANT.

The house sparrow (*Fringilla domestica*) is a very prominent member of the class of finches, a division of small birds, which possess for their size, a large amount of spirit and self-importance. The sparrow is a lustful little bird, the most impudent of the small bipeds, and universally acknowledged to be the emblem of small specimens of the Great *biped* Man. They are prolific and pugnacious, but puny, mean and insignificant in their doings; yet their very insignificance, protects them from the attacks of the noble-minded of our race.

The cock sparrows fight in a peculiarly bold manner with each other; which certainly typifies the contests that take place, between the mean but quarrelsome members of our species. They are clever birds, and show much skill both in thieving and in performing tricks; and were they less abundant, they would be more admired, notwithstanding their dusky colour; particularly in towns where the smoke begrimes the rosewood-like markings of their plumage.

The sparrow has been too much persecuted, for it is especially useful in devouring the seeds of many weeds, which would otherwise choke the land. We should not desire the disappearance of these little birds and their human analogues, who are so

useful in picking up many trifles, that might otherwise grow into gross abuses. GREAT PEOPLE CANNOT ALWAYS ATTEND TO SMALL THINGS.

The goldfinch (*F. carduelis*, Linn.) one of the most sprightly, elegant, neat and clever common birds, is universally a favourite. It is even more capable of being taught tricks than the sparrow; and its brilliant plumage and restlessness, render it an interesting bird to keep in a cage.

The goldfinch reminds us of an agreeable, sprightly, singing, dancing, juggling little man; much admired by the ladies; who like their female types of several of the other finches, are often ready to mate with such an one. The goldfinch in captivity, unlike most other small birds will pair with two or three female canaries in a season, the young of which are also prolific. The men typified by the goldfinch, are neither very chaste nor very constant. This bird forms a very beautiful nest, strong and more compact than that constructed by most other birds, being very ingenious; like those flippant men who are so clever with their fingers.

The chaffinch—*Fringilla cælebs*—*i.e.*—bachelor finch, is so called from the males arriving in flocks earlier than the females. It is a lively bird, and its plumage is bright; hence the proverb "gay as a chaffinch." The nest is admirable in point of taste, choice of material, construction and strength. It is of an elegant cup-shape, garnished most carefully with lichens, and its eggs are likewise beautifully marked. Its song surpasses that of the other finches; but it is not at present fashionable in England, yet in Germany they admire it more than any other song-bird, except the nightingale and skylark; and classify it into a dozen different varieties. The bird is very clever in learning the notes of other birds, and becomes very tame and docile in captivity.

The goldfinch reminds us of the French character with its varied accomplishments; while the chaffinch does of the German and English; who take such special pains to adorn their homes. Some birds make very rude nests, or none at all; while others take the greatest pains, not only to build a comfortable, but elegant home. In which they show analogy with those nations and individuals, whose tastes and habits stimulate exertion; in contrast with those, who like savage tribes, care only TO LIVE; and rear their offspring in the rudest manner.

The bullfinch (*Pyrrhula vulgaris*, Tem.), is a very prettily coloured bird, but is of a stouter body than some of its family. It is pugnacious, and will not allow familiarity from the other inhabitants of the aviary. Like the "bullies" among human beings it is *black* about the mouth and under the eyes, and *red* about the neck; illustrative of its character and quarrels. The

BRITISH NESTS FROM NATURE.

Hawfinch.
Long-tailed tit.

Golden oriole.
Long-tailed field-mouse.

Crossbill.
Chaffinch.

bullfinch has little song of its own, and that of an inferior character, but readily takes up any other song, and may be taught to whistle a variety of tunes; but such a bully is a short-lived bird. A combination of musical and pugilistic tastes, is seldom compatible with long life. The song of the bullfinch is principally artificial. It is like the language of men of the bully class; who are as counterfeit in courage, as they are shallow, and inclined to copy others in speech.

The canary (*F. canaria*), a bird whose song rings in every house in Germany, is very generally kept in Europe as a cage bird. It was introduced from the Canary Isles, and like many species of animals in a domestic state, it has mostly lost its original colour. Black wild-cats, rabbits or fowls are unknown; neither are yellow canaries found in a savage state. The canary has a good natural voice, which varies much in individuals as amongst men; and is also susceptible of a high amount of cultivation.

Canaries that are mottled on the upper part of the body, and have a yellow breast, are the strongest and healthiest, in which we see an analogy with those hardy breeds of horses, that have dark manes and lighter coloured bodies.

The canary is a type of the yellow Portuguese of its native islands; and in Europe of the Coloured Serenaders. They can only reside in our country with the aid of great precautions, being natives of a warmer climate.

The crossbill (*Loxia curvirostra*) has a most peculiar and very powerful beak, the upper and lower mandibles of which transverse each other, which gives it great power in splitting fruits and seeds. It destroys quantities of apples for the sake of the pips alone, which would render it a most destructive bird were it sufficiently common. When young it is florid and red, but enjoys a *green* old age both literally and figuratively. It has been vulgarly supposed to be a Sacred bird, from the absurd fiction of its having twisted its beak, in the endeavour to extract the nails from the Cross of our Lord; and is said to have acquired in consequence the power of healing diseases, particularly epilepsy. The water left by these birds in their drinking troughs, is swallowed for this purpose by some classes of German boors.

This bird is a suitable type of distorted superstitions connected with "The Cross." Such may last the age; although as time advances they will lose their influence. It is singular that this grotesque species, *should breed in the first month of the year;* earlier in the season than any other bird. The appearance of its young in the cold, dark season, is significant of the winter or early spring of a nation's history, which is favourable

to the HATCHING OF SUPERSTITION. Successful incubation at this early season, is greatly encouraged by the highly carbonized character of the food used by these birds; which consists greatly of the seeds of the pine and other cone bearing trees: this enables them to support a great degree of cold. This incubation is a suitable emblem of dark, early days;—the January of Knowledge and Development of Life.

The starling (*Sturnus vulgaris*, Linn.) is a wise-looking bird, and clever in all its tricks and ways; for it may be even taught to speak. It is a strong species, formidable to smaller birds, at whose nests it pecks, and whose eggs it eats. Its plumage is of a dark colour with yellow specks, which is appropriate to a bird of an intelligent though thievish character.

It is a type of a pushing, enterprising person, rather important amongst the lower classes, but small amongst the great. He is talkative rather than eloquent; and has an excessive air of vulgarity, without the beauty and grace of the magpie's prototype. He has the avaricious propensities of the family to which he belongs; and has little respect for the rights of others.

The bower-birds allied to the starlings, construct an extraordinary "run" or wreath of sticks, under which they rest. This is decorated by the birds, with shells, feathers, or any thing bright or shining; the object of which appears to be sport. It reminds us of a bowling or playing alley among ourselves; and proves that birds are capable of exerting themselves, to procure pleasure and amusement as well as food: an analogy which would appear to pervade every department of Nature. Whales, porpoises and young animals almost universally sport like children, and even the old, when accompanied by their young, have their sportive tendencies. This bird has evidently an "eye to the picturesque," as the "bower" is not its breeding-place.

The starling is a type of a tradesman, while the crows by their larger size and greater powers, show analogies with the members of "the learned professions;" who like them are highly intelligent. Their plumage is principally black, like the coats of these learned bodies.

The raven (*Corvus corax*, Linn.) the head of the crows, represents the Lord Chancellor, the chief of the legal profession, as a spoiler and plunderer of other men's estates; while the eagle-owl typifies him in his legislative capacity. The raven is greedy, ravenous and gluttonous; and glories when large and powerful animals are "brought to grief;" picking out their eyes ere they are dead. Like the Court of Chancery they delight in trouble and distress; for such may end in death and spoil.

A stray sheep falls from the cliff and breaks its limbs; and as it lies moaning, the ravens come and croak about it; ere its last gasp they perch upon its body over which they stretch their glossy wings. This adds to the helpless creature's agony; it sickens and tries to turn away those eyes from the gloomy bird of prey, soon to lie seething in its maw.

This dying sheep's horror reminds us of the death-bed scene of an old man. His pulse is feeble, which leeches do not strengthen; his estate is somewhat confused; and his ideas begin to reel;—but it is too late for the settlement of his affairs. Before his mind the Blackgowns of the Court of Chancery fly like ravens, who he knows will part his substance when he is dead; for they are insatiable.

The raven loves to pick up gold or other shiny metal to carry to its nest. It is often a thief; although the bird *generally*,—and "The Court," *always*,—escape unpunished.

The carrion crow (*C. corone*) resembles the raven so much in form, colour and habits; that it may be called "a smaller edition of it." It is a type of the ordinary members of the legal profession, who are so useful in assisting to keep in check malefactors, rogues, swindlers, and all who would do injury to society. The carrion crow prefers decaying flesh to that in a fresh state, which it hides in holes. Its habits are well described by Harrison Ainsworth in his song; who also saw the analogy between the bird and the man of law. He says of the crow, "The fouler the offal, the richer his prey;" and rightly observes that it "cannot hang too long for him." Which is emblematic of the *dreary length* of many cases in the lawyers' hands.

The rook (*C. frugilegus*) is a dark and gloomy bird; partial to church-towers and church-yards; but not so much so as the jackdaw. It is a useful adjunct to the farmer; and has its analogue in the country rector; who like the rook is by some accused of taking more than his tythe dues of the farmer's corn; which some say he should not touch. For our part we like the cawing of rooks in its proper place. A rookery is often thought as necessary to a squire's domain as a parsonage; both being in the interests of agriculture. Too many rooks are a nuisance; and so a rook-pie is allowable in all overstocked rookeries. This typifies the recent onslaught on the Irish Church. The poor Irish rooks are being routed out with unrelenting venom.

The jackdaw (*C. monedula*) shows all the prattling, noisy habits of its allies the crows. It has extraordinary powers of learning to speak, and the avaricious properties of its kindred.

The jackdaw from its devotion to ecclesiastical buildings, is a type of the noisy advocate of the rights of the church.

"A man may cry Church! Church! at every word,
Without more piety than other people;
A daw's not reckoned a religious bird,
Because he keeps on cawing from the steeple."

These birds are little molested in the vicinity of ecclesiastical buildings, on account of their sacred character and lofty height, which few climbers can reach.

The magpie (*C. pica*, Linn.) is the most ingenious, elegant and clever of its family; and in volubility also surpasses the rest. It is a type of the orator and speech-maker. As speaking more than any of the small birds, it may be called their representative.—It has many analogues in Parliament.

The magpie is one of the most curious of nest-builders; for it twists thorns into the form of a mat or roof, for the protection of its eggs and young.

The plumage of the jay (*C. glandarius*, Linn.), very chaste and harmonious in colouring, is suggestive of a pretty costume suitable to a lady. The black wings and tail, and line along the cheek, answer to the skirt and black velvet neck-ribbon; while the light grey, spotted head-dress, resembles a white net over black hair.

In disposition the jay is a thief, but shows the intelligence common to its class; and as it can be taught to speak it is an interesting bird to keep in a cage. It breeds in forests, and is very destructive to the eggs of small birds. Being of a combative spirit they are attracted to traps, by an imitation of the cry of their enemy the owl, which they wish to attack.

If the magpie illustrates the orator of the upper class, the jay does the radical of the middle class, who is willing to sap the root, of what affords the greatest pleasure and benefit to man.

The chough (*Pyrrhocorax graculus*) is now extirpated in many of the old localities in Britain, where it formerly abounded. These places are strange to say, the same as those where the earlier British races have remained little disturbed; such as Wales, Cornwall, the Isle of Man and the West of Ireland. But now like these races, the bird is becoming less conspicuous.

The chough is a red-billed, red-footed bird with black feathers; reminding us of some of the Welsh and Cornish complexions, which are very pink, and accompanied by black hair. They form a considerable contrast to the persons with black hair and yellow skins; whom we have formerly compared with the blackbird.

The lyre-bird (*Menura superba*, Davis) is one of the most lovely and curious of the singular birds of Australia. Its tail

resembles a lyre of the true classic type; showing that form in Nature, is repeated in Art. Its peculiar, unpleasant song is suitable music for the savages of Australia; to whom the bulbul of Syria, or the nightingale of Europe, would be no more pleasing than the rudest music, afforded by birds of the harshest tone of voice. The lyre of this island continent, is therefore not that of Apollo!

The umbrella-bird (*Cephalopterus ornatus*) displays an extraordinary crest in the form of a large projecting hood over its head; as well as a plume in front of long dark feathers. From its aspect it might appropriately attend funerals. The plumage of its head and neck, reminds us of a black cloak. So dark and gloomy a bird in an attire resembling a mourner, as an inhabitant of the fertile regions of the Amazons, is in harmony with a soil teeming with organisms in *decay* and *birth;* whose very aspect, throws around the traveller a gloomy impression.

The waxwing (*Bombycilla garrula*) is a bird of bright and harmonious plumage, with a flowing beard and a fine crest. It is ornamented with little wax-like feathers, which tip some of the quills of its wings. It is gregarious in winter, and occasionally visits Britain in flocks, during the storms which accompany this season; but chooses the colder portions of Finland and Lapland as its breeding resort. It is perhaps the most beautiful of the small birds that visit our Island, but is distinguished by a harsh cry, and dirty habits. In Lapland it is much esteemed for the table, where it supplies the place of the *bec-a-fico* and the ortolan.

When we see the fairy form of the waxwing, during the chilly, dusky days, we think that other lands are worse than ours, and that the little bird feels glad to come among us and share our seeds and berries.—If our country is cold, theirs is colder still.

Birds of Paradise (*Paradisæa*) were long misunderstood. They were supposed to inhabit the air and not touch the earth, and feed on the dews of heaven, and never needing to perch had no feet. As they were believed to have so little connexion with Earth, they were called birds of Paradise; but the knowledge of their habits was as confused, vague and uncertain, as that of this unexplored country. Now they are known to possess feet, and to live on fruits and insects like other birds.

The land in which they dwell, although a *Paradise of Birds,* of reptiles, of insects and of plants; is not a PARADISE OF MAN. He imitates the low forms of life in the abode of these birds, in the isles of Sunda; and especially in New Guinea; where pestilence mocks at the life of man.

The emerald bird of Paradise (*Paradisæa apoda*, Linn.) is a splendid species; and as it flies with the sun shining on it, glances like a meteor (Lesson) dazzling the view; for its plumage is so soft, that it appears like a golden train. It is most elegant in its habits, and apparently admires itself as much as it is admired by men. Good plumage in birds, is an indication of physical vigour and lively spirits attendant thereon. The life and cheerfulness of Man, are generally greatly dependent on the state of his health, for the mental and physical condition are usually found in harmony.

The voices of these birds are harsh and unpleasant to the ear, which somewhat lessens their attractive qualities. Their habits are arboreal; and they seldom perch on the ground except to quench their thirst. The birds are polygamous like the unchaste natives of these isles; which shows them to be the type of the inhabitants of that sensual paradise, to which the followers of Mohammed expect to retire.

The humming-birds (*Trochilidæ*) are the representatives in the Western Hemisphere of the sun-birds of the East, and are smaller, more delicate and brilliantly decorated if possible than the Nectariniadæ; those creatures of sun, who "suck the honeyed flowers." They are tropical birds, far too brilliant to be characteristic of cold climates, or to bask in a winter sun. These are allied to the warblers in their method of breeding, as well as in shape. They shine like brilliant gems amid the gorgeous fauna of warm and tropical America. Their plumage sometimes exceeds in lustre any human productions, for it surpasses in dazzling refulgence, plates of burnished metal.

It is curious to observe insects and birds, decorated with scales which might be mistaken for polished metal, did we not know by chemical tests that it is mere unsubstantial tinsel, the glitter of gold, of copper and of gems without anything of their substance. We likewise see that the most powerful and intelligent birds, and the most wonderful insects in their habits and their works, lack this false glitter, which often appears to hide what would be otherwise plain, of insignificant size, and of puny and feeble force.—A large beetle in our cabinet, weighs eight times as much as a small humming bird.

Poised on the wing, they make a reverberating sound as they sustain themselves; reminding us of bees, or of the little British moth (*Macroglossa stellatarum*) which goes by their name, and is all we in our climate know of the humming bird. Except bats and fish, they are the smallest of the vertebrate animals; and so much less than most birds, that our wonder is excited, in beholding them perform all the functions of pairing, nest-building and rearing their minute young; as perfectly as the largest

species. The humming-birds are less intelligent than many other divisions of birds, but some are sufficiently so to make ingenious nests. They show a courage in defending their young and eggs worthy of the largest birds.

The bird-catcher spider (*Mygale*) attacks these little gems and their infant progeny, sucks their blood, and leaves but glittering dust. Which reminds us of a lovely flower crushed by a Giant's thumb; or a bright "child of Eve" in the grasp of grim Satan. Their sportive motions and habits are significant of pleasure, and suitable to the perpetual summer which commonly smiles on their lives. But even they, have their battles with each other; for the *hot* atmosphere they breathe will sometimes provoke ire. They are especially characteristic of the fauna of Mexico and Peru; and delighting in the bright days of that climate, and the beams of the great luminary; they may be compared with the aborigines of those countries, decked in a gorgeous attire of gold and feathers, who WORSHIPED THE SUN.

The woodpeckers are a useful class of birds, as they are mostly insectivorous. They are oftener heard than seen, for the tapping sound they make on hollow trees, to dislodge the insects therein, echoes through the woods. The green (*Picus viridis*) and spotted woodpeckers (*P. major*) are those species most familiar in Britain. They are true foresters, like the woodsmen whose business is to destroy insects injurious to the trees.

The plumage of the different species of woodpeckers varies much; some being very bright and gaudy, and others of dusky tints, especially the females. The costumes of the keepers of the forests are very different, some being obliged to wear a gay livery; while others adopt a plain attire. However brightly the men may be clothed, their wives are mostly dressed in dingy garments.

Foresters and woodpeckers are both necessary to the well-being of society, and the protection of valuable timber. The former may injure the trees in spring, by tapping them for their luscious juice, or by breaking off their branches for firewood; while the latter may in search of insects, sometimes peck holes in sound trees, or enlarge those in the partially decayed.

The wryneck (*Yunx torquilla*, Linn.) is a summer visitor from the north of Africa. It has been called "the cuckoo's mate," for it arrives a week or two earlier than that bird from the same southern region. The plumage is variegated in a remarkable manner, with several shades of grey, brown and buff. It resembles the woodpecker in food and habits, but its more dusky colour and shy manners, cause it to be less conspicuous.

Although so plain in colour, its markings are exceedingly chaste, and we admire it more than we do some other species of brilliant hue.

We may compare this bird with the consumptive but graceful cottager in plain attire, who is more pleasing than many a gaudily-dressed girl. When winter comes this chaste daughter of the forest dies, she being one of those "sweet flowers" that expire every year, unless like the birds they can pass the winter in the south.

The hoopoe (*Upupa epops*, Linn.) whose various notes resemble its names in sound, is adorned with a beautiful crest; but it is a rare visitor to our land, and does not often remain to breed. Its graceful motions and useful habits in destroying many larvæ of insects that infest timber trees, render its greater frequency desirable. It has a habit of throwing up its food in the air and catching it, like one engaged in sport. The crest it wears, rare among the soft-billed birds, reminds us of the attire of the dressed up clown, who on a holiday trespassing in a game preserve, acts "the king of the forest," but who endeavours to escape or hide himself, whenever the true Lords of the forest or their attorneys appear.—The hoopoe flies *crestfallen* before the hawks and the crows.

The nuthatch (*Sitta europæ*) possesses extraordinary strength in its bill for so small a bird, and still more dexterity in its use. It places the nuts in a groove of the bark of a tree, and continues to hammer at them until they are split; when it eats the kernels and rejects the shells. It also collects the insects it meets with as it climbs among the trees. Its back is grey and its belly somewhat yellow, reminding us of the colours worn by a Quaker; like whom also it has a habit of shaking its head. The "Friends," like this bird are distinguished for perseverance, and for accomplishing much with little means; they also know the difference between chaff and grain.

The cuckoo (*Cuculus canorus*, Linn.) is said by Shakspear to "mock married men." These words of the great dramatist, are capable of bearing two interpretations, equally illustrative of the habits of the bird. *Firstly* the cuckoo's custom of having its eggs hatched by other species, typifies the offspring of one man brought up by another couple; who are thus "mocked" by him. *Secondly* the female cuckoo, is in the breeding season followed by *several males*;—polyandrous conduct, like that of the inhabitants of Thibet, in ridicule of the exclusive sexual relation.

The cuckoo has a bad disposition; it entirely neglects incubation. It is generally believed to be nearly, if not quite indifferent

to its offspring when hatched; although instances have been observed of the old bird feeding its young. It is dirty and awkward, and has a stubborn, greedy, violent, and as we have remarked a licentious character. All these peculiarities which we have specified as characteristic of the female cuckoo, are observable in its lady-prototype.

The cuckoo lays its eggs in the nests of from fifty to sixty species of various Genera; shrikes, thrushes, warblers, larks, pipits, buntings and finches.

The "colorization theory" with which the name of M. Baldamus is associated, if insufficiently proved, is at least curious; but thirty observations of the author tend to confirm it. His researches lead him to think that the colour of the egg of the cuckoo which varies considerably, usually approximates to that of the eggs of the species in whose nest it is found. If this be a tree pipit the eggs of which are most commonly reddish, the cuckoo's egg assumes a tinge of that colour. When in the nest of a reed or sedge warbler, whose eggs are green, that colour is likewise found in the cuckoo's egg.

The "colorization theory" supposes that an impression is made on the *sensorium* of the bird, by a view of the tint of the eggs in the foster parent's nest, which influences the colour of the expectant cuckoo's egg, without however destroying its individuality of markings. This is but a new application of an ancient belief of "Female susceptibility," on which Jacob acted in his dealings with Laban's cattle.

The cuckoo visits the hedge-sparrow's nest in the low hawthorn; a type of domestic happiness disturbed in the cottage, by the bastard of higher origin, introduced into a humble family; for he like the ferocious young cuckoo, may drive his foster brothers and sisters from home.

The roller (*Coracias garrula*, Linn.) is a showily coloured bird, but possesses an ugly beak, a harsh voice and a habit of rolling its head. It reminds us of a gaudily dressed woman whose head is seldom still, with a coarse mouth, who produces a disagreeable impression when she opens it.

The roller is not nice as a cage bird, and is difficult to tame and awkward on the perch, and would be little noticed had not its feathers a bright metallic lustre. This style of woman, were it not for her "showy dress," would take a much lower standing.

The bee-eater (*Merops apiaster*, Linn.) vies in colour with the clearest and brightest skies of blue and yellow, such as are seldom seen in our land. These birds are not often killed in Britain, but appear to belong to a clime where they can reflect the tints of the atmosphere. They ornament the fauna of the

south of Europe, which in summer enjoys a semi-tropical climate. The bee-eater abounds in the Greek Archipelago, and is caught by the Cretan boys as it flies past, with a hook baited with a lively insect; for its food is similar to that of the fly-catcher. Its brilliant plumage is accompanied by little merit as a songster, and is emblematic of the gaudy tints of dress, so much in vogue in Algeria,—the home of this species.

The workman of northern Europe is not surrounded by brilliant tints in natural objects, to provoke emulation in the colouring of his manufactures; and thus sober hues in dress and ornament have generally prevailed.

The kingfisher (*Alcedo ispida*, Linn.), is an exception to the common order, by which the tints of the birds of Britain, correspond with the dull hues of the skies; but which yet possess a varied beauty and grandeur, not to be excelled. No common bird of Britain is so brightly coloured as the kingfisher; for green, blue, buff, orange and bright red, unite in adorning this gorgeous species. But its body is clumsy, its bill heavy, and its motions awkward; yet its flight is rapid, and it utters a peculiar cry as it darts into the air. It sits quietly on the branches of the trees overhanging the water, from whence to pounce down upon those minute creatures of the finny race, that approach the surface. It places its eggs on their bones, usually in a hole dug by its own efforts, in a bank overhanging a stream. The first week in April is called the "Halcyon days," for then the kingfisher begins to sit. The storms which accompanied the equinox have ceased, and tired Æolus for a moment holds his breath. The bird's habit of breeding just at the commencement of pleasant spring weather, has caused it to be viewed almost with superstitious feelings. Winged fable has given it control over the air; and it has been stuffed and suspended in cottages as a weathercock. When compared with other birds that live on fish, its brilliant hues give it a regal pre-eminence; but its small size renders it one of the most insignificant of fishing birds. Those who are regal and pompous merely in dress, excite little respect; they are like stage kings or queens, having as little power as the King that "Drinks" on Twelfth night.

CHAPTER IX.

THE POETRY OF BIRD LIFE.—*Continued.*

PARROTS—MACAWS—COCKATOOS—TOUCANS—SWALLOWS—DOVES—PHEASANTS—PARTRIDGES—PEACOCK—COCK—OSTRICH-FAMILY—DODO—QUAIL—BRUSH TURKEY—PLOVERS—CRANE—BUSTARD—HERONS—STORK—SPOON-BILL—IBIS—WOODCOCK—ADJUTANT—FLAMINGO—BALÆNICEPS—RUFF—GALLINULES—GREBES—SWANS—GEESE—DUCKS—DIVER—GUILLEMOT—PELICANIDÆ—TERNS—GULLS—PETRELS—PENGUINS.

OF all classes of animals that make their voices heard in the forests of the tropics, those of the parrot tribe are the most disagreeable. The roar of the lion, tiger or jaguar, is individually more terrible than the cry of these birds, and is associated with shedding of blood; but it is usually solitary and not like that of the parrot, echoed by a host of comrades, whose united clamours,

> Assail the ramparts of our ears,
> And take the drums by storm.

The nerves of the traveller on the Amazons, are more shaken by such an aural assault, than by the yell of the wildest beast.

The analogue of these birds is to be found in the prating, prattling, never-tongue-tied class of persons, who commonly have noses like parrots' beaks, and goggle eyes to match. These when at all numerous, are more formidable to persons of delicate nerves than the tigerish bull-dog class of men, who are usually so much dreaded and avoided by society. The parrot class of men on the contrary, although so disagreeable to some persons, are commonly protected and petted. The voices of these individuals, like those of parrots, are generally sharp and harsh; yet they find admirers, nay even worshippers, who make parties to hear them talk; but they are often malicious, and can use the foulest language, instead of the flattering phrases they sometimes express.

Parrots, like human imitators, display different degrees of cleverness in their performances. The men with whom they are compared, are accused of repeating words and sentences,

without comprehending their meaning. The parrot is not a creature of Europe, and the nations of whom it is a type, are not European. The natives of that continent are not "parrot-like" in their method of learning; but the countries that produce parrots, nourish also nations of imitative tendencies, who in a greater or less degree adopt the manners and institutions of their superiors; yet *comprehend* them but little.

Parrots are worth examining in detail, as affording a striking analogy with classes and nations amongst men. They are wonderful climbers, having powerful feet and beaks, which are almost as hard as the hornbill's. They greatly use their beaks in progression; for seizing on the branches of trees, they can raise themselves into a higher position. This habit is illustrated by the manner in which some persons, rely more on the *use of the mouth* to assist them in "moving in society," than upon manual labour. Parrots live to a great age, and in style of features, remind us of those we occasionally see amongst ourselves. Some species are apparently good-natured and affectionate towards men; while others preserve a cool indifference, which is often most markedly expressed in their eyes, which sometimes indicate a high degree of impudence and selfishness. Some of the smaller parrots are gentle and affectionate to one another; almost equalling the dove in this respect. The whole genus show great affection for their young, and carefully choose their breeding-places.

Monkeys and parrots show much analogy in character and habits; they both possess extraordinary powers of imitation, which they exercise in copying man and his peculiarities. Monkeys "take off" his gestures, and parrots his speech. Both are excellent climbers and are mostly arboreal in habits. In their native forests, parrots are exclusively vegetarian; but in confinement they show their flexibility of habit, in eating readily almost everything that is set before them. They accommodate themselves most thoroughly to the diet of artificial life, and appear to enjoy such luxuries as pastry and highly-flavoured viands, and even learn to relish wine to excess.

"Parrot-like" nations more readily imitate the vices than the virtues of their superiors. Parrots are pre-eminently social; another resemblance to imitative men, whose predominating sympathies, induce them to desire constant society; which birds, quadrupeds and men, that possess more *individuality*, do not so much seek for.

The most remarkable peculiarity in parrots, consists in their admirable power of imitating the speech of man; which is not however given to all species; or even to all individuals of a species in the same proportion. We have an instance in the

pathetic story related in Humboldt's "Views of Nature," of how the language of the unfortunate tribe of Atures was preserved by an old parrot, after the tribe had for ever perished. An instance of what an humble imitator; an eaves-dropper; a creature insignificant in itself, may be the means of doing. A nobler creature might be too unbending to stoop to this. Such was Boswell, who did for Johnson's memory, what the parrot of Atures did for its dead master;—IT PRESERVED HIS LANGUAGE. The species tamed by Johnson, in that idiom Dog-Latin, is the *Boswellia Parrotii of Canis.*

Parrots of the most brilliant plumage, are often least gifted in the power of imitating speech. The most wonderful and intelligent birds also of other orders; whether as songsters or architects, are usually not brightly coloured. The sombre hues of the honey bee, the ant and the *Locusta migratoria*, that most destructive of insects; are themselves indicative of power. Their very dusky tints compounded of bright colours, typify combined forces, which are much the most powerful. The Bilious-Nervous temperament, accompanied as it is by so much of the colour brown, is that which indicates the greatest strength and activity in the higher animals.

The macaws are the largest, strongest and grandest in plumage of the genus, and have regal and pompous magnificence about them, worthy of the gorgeous courts of Mexico and Peru, as they were;—and of Brazil as it is. But they show less capacity for learning to speak, and are more satisfied with their own attainments, than the wiser, yet smaller parrots. They are ill-tempered, and bite sharply and severely when provoked. The red and blue macaw (*Psittacus macao*) is the largest of the class, and can speak better than any of the family; but it is dirty in its habits. It is a type of the Brazilians, who, with all their gorgeous style of living, show much that is unclean and offensive.

The macaws of St. Domingo are as inferior birds to the green macaws (*P. militaris*), as was, and is the government and national character of the people of that island, to those of Mexico and Peru. This is a magnificent species, and worthy to be the type of those great but faded monarchies. The land is still green, and there is yet hope that good government may accomplish much. These peoples are now in their moulting state; but when their new plumes grow, they may yet shine in their sunny lands again.

The Illinois parrot (*P. pertinax*), a common bird in captivity in Europe, builds in the termite hills of Guiana and Brazil. It is affectionate and intelligent, but its talking powers are very insignificant; yet its plumage is extremely beautiful. These

birds congregate in flocks of several hundreds, and post two or three of their number as sentinels, to give notice of the approach of enemies. Similar habits are observable of monkeys; —and of Man in a savage and civilized state.

Parrots illustrate many classes and occupations. Thus there are "orators" among parrots, who like prating men of great speaking-power are certainly highly talented; yet such close imitators, and so much inclined to parody; that they may afford amusement, but can never inspire respect. They rank higher than buffoons; for their sentences are longer, and they rely less on what is noisy, than on what is pompous and long-winded. Instances of parrots repeating considerable passages, from the works of great authors illustrate this; as the parrot who repeats merely a few words, or imitates street-cries does the "Buffo." The opportune manner in which it introduces sentences is sometimes very striking, accompanied perhaps by a guffaw, closely imitated from some silly fellow, who laughs loudest at his own jokes.

There are "parrot-like" lawyers, who are very clever. There are "parrot-like" clergymen, who read the service with no more feeling than these birds do, when they repeat The Lord's Prayer or The Apostles' Creed. A bird that could repeat "The Creed," was bought for a hundred pieces of gold by a Cardinal; whose appreciation for its unfelt utterances, was doubtless founded on similar sentiments.

Parrots learn tunes which they can often whistle with correctness, but without feeling. A type of the harsh Old Maid who sings. Her voice is as much dreaded by the children in the nursery, as is the cry of the carrion crow among the chicks of the farm yard. The parrot,—her idol has closely imitated her voice and exceeded the model in asperity. The talking parrot is a favourite with the unreflecting and gullible portion of the public, who mistake its senseless utterances for humour or wit; as they also do the folly of Buffoons, and the blunders of noodles. Fools rate at a higher level than they deserve, the mere parrots of all professions, who are the most idle and useless of their craft, and yet the most noisy and voluble.

Cockatoos are an elegant stately class of birds, which have a genteel air about them; but yet among us are purely ornamental; for they show even less intelligence than parrots. They may utter a few words, which seldom go farther than their names; for they are more occupied in keeping their feathers in order; and putting on stately and lofty airs; than even in active mischief. They remind us of lazy but beautiful *blondes*, wholly given up to dress and contemplation of themselves; not being able to talk about anything else. Like

oriental beauties the cockatoos are mostly attired in white, but are yellow about the face and head. There are black cockatoos, which illustrate Melanic Sultanas of the Oriental isles; who are about as useful as their white allies.

The little parrakeets form a numerous division of graceful, charming birds; not to be excelled in beauty by any class kept in cages; and their dispositions are equally amiable; for they show a gentleness and sweet affection for each other, equal to the turtle doves. They may well be called "love birds," for they are what we *love* to contemplate, and may teach many of us lessons in conjugal or brotherly affection. They mourn the loss of their companions, and have been even known to die of grief; which we do not commend in them, or in those persons whose feelings are so intense as to wither at any shock of this kind. Yet a little more grief, like that displayed by the constant birds, at the loss of mates or relatives, would be pleasing even amongst Mankind.

The toucans (Rhamphastidæ) are relatively small birds, but have bills which approach in size those of the largest living species. Their wings and beaks are vividly coloured, and their markings remind us of the tattooing of savage nations; but the brilliant colouring of the bill is only retained during life. Like most nations who tattoo themselves much, they show pugnacious dispositions; savagely attack the young of other birds, and pierce the nests with their powerful beaks. Even those built of strong clay such as the *Synallaxis*, are destroyed by them, although safe against many mauranding reptiles and birds, who are not so powerfully armed as the toucans. But in the dry season the clay nests of the rufous bee-eater, are sometimes impenetrable by this bird, which most cunningly waits until the rain softens it; when it proceeds to the "breach" and destruction of the tiny fortress.

Sir Robert Schomburgk mentions a tame toucan, which domineered over the fowls and even large four-footed beasts, on an estate in Guiana. It was allowed to feed itself first, and maintained order among the large and small creatures on the farm.

The upper mandible of the toucan, being so much larger than the lower, it is awkward in the use of its bill; being like the hoopoe obliged to throw its food up in the air, and catch it in its open mouth.

Bullies have their representatives in every order, and are generally awkward and coarse in their manners. Such have mostly large mouths or beaks; or large heads, with a body—like this bird's—comparatively small; a combination significant of great impudence and courage, when contrasted with position.

The swallow (*Hirundo rustica*, Linn.) is viewed from its first appearance in April, till its departure in autumn, with more pleasure than most birds. This pleasure is accompanied with a feeling which to the greedy and selfish would greatly enhance any psychological or æsthetic interest, the knowledge that it does not feed on grain, green peas or berries. Its food consists entirely of insects, which it catches on the wing. These are principally gnats and other minute Diptera: but often in

THE RED AND BLUE MACAW, PSITTACUS MACAO. Page 229.

flitting in the neighbourhood of hives it may capture the industrious bees.

The swallow like other migratory birds, visits in summer the land of its birth, and in winter the land of its adoption. They are a graceful tribe, and for such small creatures have marvellous power on the wing. They are ingenious nest-builders, for they plaster the mud on perpendicular walls, and with the aid of straw and roots, make so strong a dwelling, that were it

not pulled down by man, would usually last a good many years ; and it is accordingly inhabited by the bird for a succession of seasons. The swallow is awkward in its movements on the ground, but it clings gracefully to its nest, and on the wing it is at home. In its undulating flight it approaches very closely to objects ; but when we think it will dash itself against them, suddenly alters its course, and in a few seconds is far from danger. This rapid change of movement reminds us of that of a skilfully-managed yacht of the most approved construction ; whose proximity to the shore, causes us to fear for her safety ; yet she makes a sharp curve, and launching securely into deep water, makes a safe path for herself.

Swallows by their different movements, are supposed to prognosticate foul or fine weather. They haunt us in many dreams, in which we, in imagination floating on the air, visit many lands like these migratory birds, to be revivified by change of scene ; for if we cannot like birds fly in person, we can in thought. Those who possess the power of dwelling in the happy days of youth, and in the likewise pleasant days of experience, when though the season is not so genial, yet hope makes it cheerful, never grow old :—Like the laurel they die green.

The goatsucker (*Caprimulgus europæus*, Linn.) is absurdly named ; for its structure would render it incapable of sucking a goat.* It is a beautifully marked bird, with a plumage shaded like the wryneck with buff and brown ; which may be compared with that of some owls, also nocturnal birds ; whose unobtrusive colouring renders them the better able to pursue their prey unobserved. Goatsuckers are stupid birds ; they make no nest, but merely lay their eggs in a depression on the ground among the ferns. They fly in a clumsy manner in search of the insects, which taken on the wing form their prey.

The swallows as day-flying species, may be compared with the falcons ; and the goatsuckers, birds of night, with the owls. Nocturnal species of animals, illustrate dark, gloomy influences, which pervade all Nature. It is only the greater workers that are then in repose, the lesser are not hushed to slumber ; but as eve opens, enter into busy activity. The earth is then peopled by moving creatures, when the motions which accompany daylight have ceased.

The passenger pigeon (*Columba migratoria*) is the most migratory and remarkable species of the genus, for it comes in count-

* This bird will sometimes perch on a sheep's back, probably like the starling to feed on the ticks and maggots which infest the animal. When seen clinging to the belly of the brute during the twilight, it might easily be supposed to be sucking, when it was in reality removing noxious pests : tradition has usually some foundation in fact.

less numbers, covering the ground, trees and bushes for many miles. The devastations they commit, are dreaded by the civilized man, when in their annual migrations, they approach his fields. Like the locusts they break the trees by the weight of their myriads. They strew the whole country for long distances with their dead bodies, unfledged birds, eggs and dung, which are largely devoured by birds of prey, pigs and dogs. The pigeons scatter themselves over the country to collect food, and have been known to leave their nests early in the morning; fly sixty miles to a place, where food was abundant, and return before noon.

These rapid movements of the bird remind us of the journeys of men of business, who *sleep* and *multiply* in Brighton (fifty miles from town); but who visit London daily to obtain their livelihood. The migrations of this species of pigeon in countless numbers, represent the emigrations of European nations towards the West. During the late war they fell victims to many enemies as they landed from the East, being sometimes almost as helpless as these pigeons in the vicinity of their foes. The bristly hogs typified "the railway contractors," and the birds of prey the "conscription crimps."

The inhabitants of Kentucky use burning sulphur, guns, clubs and long poles to drive away these birds, but only with partial success. It was somewhat wonderful, that the dread of sulphur and gunpowder, did not deter human emigrants from rushing to the United States at the time of the late rebellion.

The turtle-dove (*C. turtur*, Linn.) is prettily and delicately mottled, if it does not display the brilliant plumage of some exotic species. As the turtle cannot bear the cold of our climate, it visits us only during the mild season, and its pleasant note is a true indication that summer is near. "The winter is passed, the rain is over and gone; the time of the singing of birds is come, the voice of the turtle is heard in our land." Then is the happy season when all "nature is married."

The ring-dove (*C. palumbus*, Linn.) is the most common in Great Britain, and is a most attractive bird, from its sweet note, and beautiful though stout form. Its hue is modest, and were it not so destructive to vegetation, it would be more generally liked and less persecuted. Its ring which only goes half-way round the neck, is like the ring of betrothal, not the ring of marriage. The collared turtle-dove (*Turtur risorius*) on the contrary, has a plain thin mark round its neck like a wedding ring. Betrothal rings have a broad top, and are often "half hoops." This pigeon like the passenger species, flies far to obtain food for its young;—a tender solicitude for offspring, which in man is the accompaniment of constancy.

The pheasant (*Phasianus colchicus*) stands at the head of British game birds; with all the grace of an exquisite form and shape, and all the gorgeousness of regal state. It represents a European sovereign; as the peacock, and gold and silver pheasants, whose plumage is more brilliant, illustrate the more gaudy attire of Oriental princes. The pheasant as a native of the East, represents the Oriental origin of many of the brilliant ornaments of European kings; yet it and they, have been long naturalized in the lands of the West.

The pheasant, like many other game birds is polygamous; a peculiarity not uncommon amongst those men exclusively devoted to sports and games, although it may not openly receive this name. In mediæval times our sporting characters dressed in brilliant attire; which we may compare with that of the cock pheasant; but now "Young sporting England," is clothed in sober hues, like the hen or young pheasant.

The partridge (*Perdix cinereus*, Linn.) is, compared with the noble, arboreal pheasant, an humble insignificant creature, in colour as in habits; for it seldom mounts trees or flies high. When it does take wing, it makes a great noise;—a striking contrast to the flight of many birds. If clumsy flyers, they are good runners. They are monogamous, and have a modest, innocent expression, unlike that of the licentious cock pheasant. Being principally graminivorous, they consume much of the farmer's crops, which is condoned on account of their great value as game.

It is difficult to induce them to alter their habits, like their analogues the rustic squires, who are not given to flying high or far. Pheasants are often bred in towns, and are carried out into the country for sporting purposes; but the old-fashioned country squire and partridge, do not care to breed in the city. They are noisy, but not inclined to showy display. Some dispute the utility of the modestly attired partridge and his master the squire, as obstructive to agriculture in eating up the produce of the land. These forget that the landlord as well as the birds of heaven, are entitled to subsist on the fruits of the earth.

The English partridge is a nice juicy little bird, but not so large and strong as the red-legged species (*P. rubra*, Briss.); when these are brought in contact, the weaker bird gives way. This has been the case in more than one part of England. The Normans in like manner subdued the Saxons, and in some localities became the predominating element in the population.

The golden and silver pheasants (*Phasianus pictus* and *P. nycthemerus*) are among the most beautiful of their tribe, and shine as they fly, in their native woods like the Sun and the Moon.

The golden pheasant,—a native of Japan, reminds us by its

bright plumage of the Japanese Daimios, whose social position and splendid style of living, command so much admiration. The silver pheasant we think typical of the Mandarins of the Celestial empire.

These pheasants fade into insignificance in sight of that comet amongst the birds, the peacock (*Pavo cristatus*) whose main glory consists in its tail. It is nearly unexampled in variety of tint for so large a bird; and its hues are distributed in a most attractive manner, so that it forms when in good plumage, with its tail spread towards the bright sunset, one of the finest objects on which the lover of the beautiful can feast his eyes.

This bird has long been thought so conscious of its personal importance, as to have become the representative of pride in human character. For like a man in whom *pride predominates*, it throws its head back as it walks;—the natural-language of large "Self-Esteem." Its fine crest is then erect; but when terrified it lowers its crest and tail, and retires "in all the consciousness of defeat." It is interesting to watch a pair of bright peacocks, in combat for a dull peahen; like two Oriental potentates devoted to a Venus of the East. They approach each other with crests erect, and tails expanded, in a slow and dignified manner, watched perhaps by the barn-door fowls with astonishment from a distance. They begin their fight by pecking at each other's tails, which are typified by the border-lands of Indian Sultans. When the conquering prince has shorn his enemy of much fair territory on the outskirts of his dominions, he attacks his capital. The victorious peacock in like manner, having plucked the plumes and tail of his antagonist, flies at his head. A stage in the conflict, both with princes and birds, followed by the retreat of the weaker party. Neither Indian princes nor peacocks, have a *foundation* of much courage beneath their glittering array.

The peacock throne of Shah Jehan, came behind that monarch, like the tail of this creature which it imitated. The train of the peacock following the body, has doubtless suggested much of the pomp, the "*appanage* of royalty." The pride of Oriental sovereignty is like that of a gallinaceous bird, such as this. It has little of the *hard*-courage of the hawk or the owl, which conquers birds of larger size than itself. The peacock in this respect is inferior even to the turkey of America (*Meleagris gallipavo*), whose degree of courage in attack and defence, reminds us of the Mexican princes.

Montezuma the greatest aboriginal potentate of the New world, was illustrated by the ocellated turkey (*M. ocellatus*) which has some of the gorgeousness of the peacock of the East, just as Montezuma had of the great Oriental princes. He suc-

cumbed after a faint show of resistance to the Spaniards, as these turkeys do to the larger birds of prey.

The common domestic cock (*Gallus domesticus*) and its numerous varieties, like all other creatures that have been thoroughly tamed by man, show very great variation in size, form, colour and markings. Cocks and hens, like horses, dogs, cats and sheep, show an analogy to each other, as regards temperament and complexion. Red fowls most approach the sanguineous temperament; they are the most courageous and the best for gaming; and light-coloured fowls, including the brownish, reddish and speckled, are the most prolific, and perhaps the best for the table; being milder both living and dead. Red-haired men are commonly hot-tempered and quarrelsome, and have often a great deal of "game" in them. Black breeds of fowls are often preferred to other varieties, on account of the large size, number, and superior qualities of their eggs. The secretions such as milk, of black-haired or black-skinned animals, are rich. But fowls and most other animals which are melanic, are more susceptible of cold than red or light-coloured breeds.

There are many intermediate varieties amongst these birds, some being curly and rough in the feathers and others smooth; analogous to the hair of different human races.

The ostrich (*Struthio camelus*) vastly exceeds any other bird in size, now inhabiting our globe. It is a native of Africa, the country that produces the largest known quadrupeds, and which is thus made the metropolis of animal life. It has been compared with the camel as inhabiting the desert, as having a long neck and legs, and in being able to pass a longer time without drinking than most other birds; and it is the only species that has been hitherto used for porterage.

The ostrich has little general intelligence, and the Arabs even consider it proverbial for stupidity. It is variously described as "a good" or "the worst of parents;" but the truth may doubtless lie between these extreme accounts. The ostrich in Scripture, is said to "leave her eggs in the earth," and to be "hardened against her young ones." This indifference is probably only comparative when contrasted with the devoted affection manifested by other species, who sit more constantly on their eggs or young. The ostrich leaves her eggs when the hot sun renders her presence unnecessary for warmth. She evidently takes as little care of them as is consistent with their preservation at all, and therefore Luther was just in his application of the Scriptural illustration in Job. xxxix., to the negligent parent of his own time.

The Rheas are the ostriches of South America, but smaller and more insignificant than those of Africa; yet they are fine birds and by far the largest on the American continent. Like the "camel bird," they are very swift of foot, and tax the speed of the best horses of the country, and like it are often accused of deserting their eggs. They lay them at considerable intervals, so that they cannot all be hatched at once. Each hen bird does not hatch her own eggs, and they are supposed to sit by turns on the common lot; but the male has often charge of the nest. It is probable that the last eggs laid, form the first food for the newly-hatched birds. Bad mothers among ourselves leave their children more than they ought to their Father's care; who instead of being the master and protector of all, is made to perform DRYLY the office of a nurse.

The cassowary (*Casuarius galeatus*) a swift and powerful bird allied to the ostrich, inhabits the Sunda islands. It is becoming scarce from being often wantonly killed, for its feathers are not valuable for ornamental purposes, like those of that bird. At a distance they look like hair, yet on examination are seen to possess the character of those of birds. The bird fauna of these islands "is less vigorous" than that of South America. The cassowary is weaker than the Rhea, but it is stronger than the emeu (*Dromaius Novæ Hollandiæ*) the great bird of Australia, which has the poorest fauna and flora of any great country, not within the arctic circle. The human aborigines are *lower* in the scale of Morals and Intellectual capacity, than those of any part of the world of Equal extent.

A very large bird (*Casuarius australis*) the second largest living, has been lately found in Australia: it is a type of the savage Bushrangers,—"Monsters of Iniquity."

The kiwa (*Apteryx Mantellii*) is one of the last of a family of Struthionidous birds which supplied the place of large mammals in the island of New Zealand. The love of this bird's feathers and juicy carcase, have led to its becoming nearly extinct. It is we fear a type of the Maori population, who seem destined to disappear before more powerful emigrants. As they did to the great birds of that island, so will be done to them, by the more powerful Anglo-Saxon race. The kiwa is a nocturnal bird of heavy, stupid aspect, that burrows in the ground. A type of the degraded Maoris, as compared with the more civilized Malays, of the same division of the human race. They have been in as great ignorance of what was passing in the world, as nocturnal birds are of daylight movements.

The mooruk (*Casuarius Bennetti*) of New Britain, is one of the most curious of its family, exceeding in wildness of aspect those of others of its class. Its long, straight, shaggy, black,

hair-like feathers are decorated with brilliant colours. It reminds us of the dark savage men of its home; who paint devices of bright tints on their bodies.

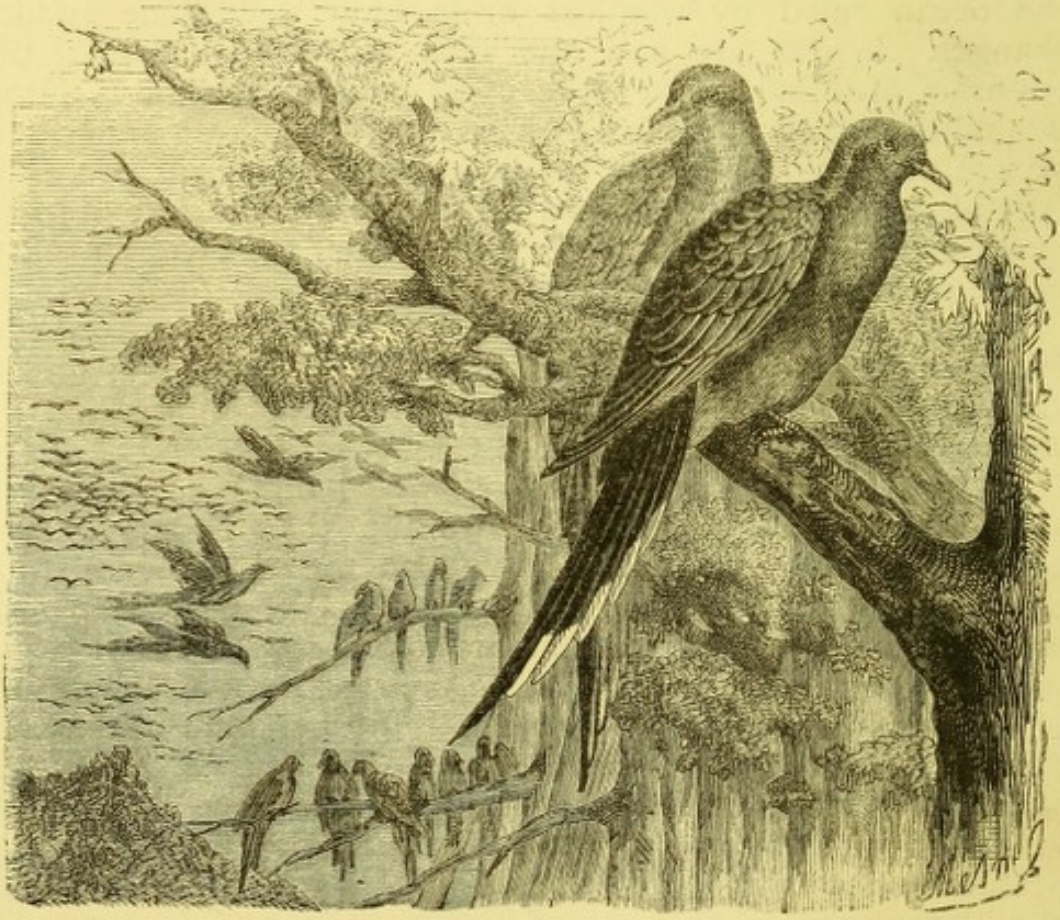
The dodo (*Ditus ineps*), an inhabitant of the Mauritius, Bourbon, and perhaps some other adjacent islets; to the great grief of men of science has been long extinct. It shape was quite unlike that of any other bird, for its little wings, could never have admitted of flight, and its short legs must have rendered it a poor runner; and as an easy prey to man and animals it was soon extirpated. It was described as fat and gross in flesh, and of a dull melancholy aspect.

Let us endeavour to recal for a moment, the days when the dodo reigned the principal animal of the Island of Mauritius. The lovely Isle was richly wooded, well watered and very fertile. The scene of the tale of Paul and Virginia, has thrown an air of romance around its shores. In the days of the dodo's reign; it was uninhabited by Man; and his first settlers CONQUERED ITS KINGDOM. It is now occupied by a lively and industrious population, who have rendered it one of the most productive spots on Earth, for the valleys produce abundance of sugar canes, yams, manioc and maize. Various islands of the ocean ruled by wingless birds, have undergone similar changes. Where are now the moa of New Zealand; the epyornis of Madagascar; the great auk of Iceland? Dead behind the march of man! FOR EVER!! In like manner, His savage races perish before the advance of the civilized. The Age of great reptiles is passed or is passing; the Age of great quadrupeds and the Age of great birds; but the AGE OF MAN in the plenitude of power is COMING.

From the few relics of the moa and the dodo that we have, Professor Owen has built up perfect skeletons, which give a vivid idea of them; so that the naturalist when wearied by anatomical details, may dream of extinct birds.

The grouse (*Tetrao*) are more beautiful than partridges, and more hardy than pheasants. They have the independent spirit of the inhabitants of a wild mountain forest, or a free and open moor. The natives of high-lands are commonly more addicted to the study of nature and attached to their institutions, than those of low-lands. In this they resemble the mountain grouse, so difficult to tame. The lustful quails care not for the stalks of heather gathered from the mountain sides; but for the rank luxuriant produce of the plains, that can flourish best where pestilence abounds. The quails remind us of the voluptuous and degenerate inhabitants of many cities and low marshy lands, who lack the high qualities so common to mountaineers.

WHITE SPOONBILL, PLATALEA LEUCORODIA. Page 243.



PASSENGER PIGEONS, COLUMBA MIGRATORIA. Page 233.

The brush turkey (*Talegalla Lathami*, Gould) of Australia, is a small species compared with the bustards and the turkeys of America, and is like them typical of the Australian race, so degenerate compared with others.

The talegalla has an extraordinary custom of gathering together a large heap of vegetable *débris*, to form a sort of hot-bed on which the eggs are laid. The heat from the decaying vegetable matter, is quite sufficient to hatch them without aid from the parent bird; thus displaying great analogy to the method in which reptiles are hatched. A type of the "reptile" habits of the Blacks of Australia, who like this bird take little care of their young.

The long-legged plover, or black-winged stilt (*Himantopus melanopterus*), exceeds all birds in the proportionate length of its legs. They are of great importance to a bird that inhabits sandy plains, for they enable it to view the surrounding country for some distance in search of prey, or to wade through many a brook without wetting its feathers. These birds have been compared with the inhabitants of plains that walk on stilts; who like this plover would see farther than their neighbours.

The plovers, the woodcocks and the snipes are amongst the silliest of land birds. The dottrel is the most foolish of the waders, for it runs into danger that almost every other species would avoid. The plover genus typify the least acute of the Saxon population of these islands, who with *great folly* have no FEAR.

The crane (*Grus cinereus*) begins to breed in Sweden before the winter is over, and usually in remote localities, where naturalists have great difficulty in visiting the nests: hence for a long time its nidification was almost unknown to them. It is a splendid species, the tallest of the land birds of Britain, but it is not easy to observe it in a wild state on account of its shyness.

It reminds us of a lady of retiring manners, dressed in grey of a rich bluish cast, with a black silk cloak, her head being ornamented with long plumes. One species of crane is in France called the "*demoiselle*" (*G. virgo*), from the extremely delicate colours of its plumage which might suit a virgin.

The bustard from its size and height, could look down on the smaller land birds of Europe, like the great tenants of the soil on the yeomanry. The crane stands at the head of the Wading birds of Europe, and is a type of "the tenants of the crown," who manage the river fisheries. They are not usually so detrimental to the supply of fish, as the smaller tenants; typified by the heron.

The common heron (*Ardea cinerea*) is still preserved a deni-

zen of rivers and marshes, by those proprietors who wish to maintain the balance in nature. It is a noble bird, both on the wing, on land, and in water. It is very destructive to the fish of our streams, but being omnivorous it may also kill and eat many of their enemies, such as frogs, toads, small animals and birds. The heron is not very injurious on the great streams, as it feeds principally upon fish of a good size, in which it resembles the simple country angler; who like the bird is becoming more rare. The heron is as different in its mode of seizing prey from the gobbling duck genus, as is the angler, from the fisher who uses nets, which capture the fish large and small, to the great injury of the fishery.

The great and little egrets (*A. egretta* and *A. garzetta*, Linn.) are magnificent white species of the heron genus, whose plumes have adorned beauty from mediæval times to our own. The desire of gallant cavaliers to gratify ladies with ornaments for dress, doubtless led to the extirpation in some countries of these lovely birds;—ONE BEAUTY FADING BEFORE ANOTHER.

The bittern (*A. stellaris*, Linn.) "in the good old times," when corn-fields were marshes, and market gardens yielded only the bulrush and the sedge, often uttered its wild peculiar note in the Eastern counties. But now the bird is rare, a chance visitor from Holland or the north of Europe. When "the bittern possessed the land" it was laid waste, for this bird cannot exist in the midst of civilization: yet when we see it in the midst of woe, and hear its wail among ruins, we contrast its cry with that of the sweet warblers, that enliven the pleasant garden. The bittern's melancholy cry does not cheer us, but it tells of the rise and fall of cities and empires; and of the wail of those led into slavery, and thus teaches us a lesson that none of the song-birds can do; although their melody may carry our ears captive the whole summer; for they speak in simple accents of bright days, present or to come.

The night-heron or night-raven (*Nycticorax ardeola*, Tem.) said by Milton to sing, makes a dismal noise, which sounding through the gloom of the marsh when nothing stirs but the grasshopper or the frog, may well excite horror in the superstitious. The sight of these marsh birds in general, has a depressing influence on the mind. Their motions are either very slow or very rapid, and they have a dull aspect. Persons who live in marshes, lack the cheerfulness of mountaineers. They may be industrious and regular in their toils, but they want the elastic step and ringing voices, repeated by the mountain peaks. The Dutch in whose country the night-herons abound, are a grave people, little inclined to levity, who would be even more gloomy were they not so constantly occupied.

The spoonbill (*Platalea leucorodia*, Linn.), once a native of the marshes of Britain, has been extirpated. It must have made sad havoc amongst the fry and ova of fish, with its spoon-shaped bill, but it also eats many mollusca, so greatly destructive to vegetation. Most persons with very prominent lips, are stupid and sensual, as well as ungraceful, and lack vigour and skill in attack and defence. (See page 240.)

The spoonbills and ducks are often foolish birds, and cannot defend themselves with the same vigour as those with an elegant beak.

The sacred ibis of the Egyptians (*Ibis religiosa*), a fine species was adored in some parts of Egypt; and as it were in memory of the faded glories of that country, still builds on its ruined monuments. It has never visited our shores; but the glossy ibis (*I. falcinellus*, Tem.) a bird of the same genus is an accidental visitor, and from its dusky plumage has been called in the north the black curlew. It is viewed with some degree of dread by the superstitious of the north, and considered a type of the "Evil One," whose agent that nocturnal bird the common curlew is supposed to be. This last is the "lang-nebbed thing" of the Scotch; an abundant bird on mountainous heaths, and the supposed ensign of the Weird profession.

The dunlin (*Tringa variabilis*, Meyer) is one of the sandpipers; a class of little birds which are very beneficial to owners of marsh land, and were they abundant in cultivated districts, would there be equally useful; but they love the wild sea-coast. They are amongst the smallest of the waders, and show analogy to the little boys who catch shrimps as they walk in the shallows; without floating like web-footed birds—at home on the water.

The woodcock (*Scolopax rusticola*) one of the least intelligent of birds, is nocturnal in habits, and thus avoids many an enemy. As all the birds of this family lay great eggs in proportion to their size, their young ones when hatched are large, highly developed, and soon able to provide for themselves. Birds which can feed themselves as soon as born, when they attain maturity, are the most stupid of their class; for they do not appear to advance much beyond their earliest instincts. In like manner Negro children show more precocity than those of Europeans. Those children who are more deficient than the average, as regards the understanding of first principles, and possess fewer of the higher qualities of the mind; can often help themselves better than those of a far higher order; from their physical frames being developed to a greater proportion than their mental, at this early stage. Those birds that lay their eggs in nests, and whose young longest require parental care,

soar the HIGHEST, sing the SWEETEST and can TALK BETTER than their fellows. The *quality* of their instincts at a late stage of development, is far superior to that of those birds which in the *chicken stage* were more advanced. When we see them in their adult state, we can scarcely believe they were ever, even on an equal footing.

Throughout the vast Organic Kingdoms, *Precocity* IS THE GENERAL FORERUNNER OF PERPETUAL PUERILITY.

The adjutant (*Ciconia agala*), the grandest of the storks, rules amongst the birds and reptiles of the pestilential marshes of Bengal. The power of its gastric juice is so great, that it can dissolve bones. Its voracity is equal to its digestion, for it will devour all animal substances within its grasp. Cats, tortoises, birds, their eggs and young, and serpents of all degrees of venom, are alike consumed by this omnivorous bird. If it kills a few chickens, it destroys so much carrion and vermin, that it is protected as a public benefactor.

The East India Company may be compared with this bird. It rid Hindostan of many *reptile vices* which "poisoned society;" and if it devoured many small states, it "digested" them into one vast Empire. It was the King of Corporations;—THE ARCHANGEL, the Guardian of the Land.

The flamingo (*Phœnicopterus antiquorum*), a connecting link between the web-footed genera and the storks, possesses an extraordinary length of neck and legs, but a most slender gullet. Like the first it can swim on the surface, and like the second can wade in shallow water. They are magnificent birds on the wing, especially when an evening sun, and clear atmosphere, allow their brilliant scarlet hues to be seen to perfection. They fly in flocks, and have been aptly compared with troops of soldiers, in the costume of "the guards." They appear to be under the control of leaders, who give notice of the approach of danger. The flamingoes of America, like the recent armies of that country, appear in larger bodies than those of Europe.

They curiously enough build nests considerably above the surface of the ground, forming as it were stools, on which they do not sit, but stand, covering their two or three eggs with their tails. They have also been compared with clerks sitting at the desk, and thus may be a type of the soldier turned writer.

The whale-headed stork (*Balæniceps rex*) is an extraordinary bird, which has points of contact with another order of creatures. Its bill is evidently formed for scooping up ova; it thus feeds like the whale on much that is soft and blubber-like, although probably, unlike that monster of the deep, it can enjoy large prey.

It is not a little singular that this ravenous bird of Abyssinia should show a strong likeness to King Theodore. His poor subjects were as much his victims as the fish and young water-fowl are of the stork. We believe that an approximation takes place between persons much in contact. We were greatly struck with this on examining the portraits of a number of the late Abyssinian prisoners and that of Theodore. They had acquired, strange to say a considerable resemblance to their persecutor; probably from having dwelt so long on his image.

The ruff (*Machetes pugnax*, Cuv.) is a beautiful bird, showing perhaps more variety of plumage than any known species, it being difficult to find two alike. It is ornamented with a rich collar of feathers, which gives it a singular appearance. It probably suggested the "Ruffs" round the neck, worn by man two centuries and a half ago, which were introduced from Flanders where the birds particularly abounded. The ruffs are stupid birds, but are excellent when fattened for the table, being caught alive for that purpose with the godwits.

The voracious ruff is the emblem of the Flemish or English *bon vivant* 250 years ago, who wore a ruff round the neck and a glossy and brilliant attire, like "Breughel de Velours." These birds and these men, were both born and bred in marshy districts, and were very prolific.

The moor or water-hen (*Gallinula chloropus*, Lath.), a long legged species, delights to frequent the shallows among the reeds and fens. It is an excellent swimmer and diver, although without webbed feet. This bird is of a dark, sooty, greenish purple colour, the general effect of which is black, but has a red bill and feet, and by its lively motions forms an attractive addition to the water-fowl on a pond.

The moorhen is a type of the little Marshman, who lives among the reeds, and is almost as aquatic in his mode of progressing from one little patch of sedge to another, as a water bird.

The corn-crake (*Gallinula grex*) connects the gallinules with the partridges. It is a land bird, affording excellent sport, and is a first class runner; but most cunning; for when it has not the opportunity of running away, it has been known to feign death (*Jesse*) in order to throw its captors off their guard. These birds are very abundant in Norfolk; a country where the inhabitants shew more acuteness and sly dodging, than the bulk of those of our land. Norfolk is also famous for partridges, which play similar tricks.

The violet gallinule (*Porphyrio hyacinthus*, Tem.) is a splendid bird, being worthy to stand at the head of its class in "the purple robe of royalty." These water-hens of Africa, are of a cruel disposition, for with their strong bills they split open

the heads of chickens and eat their brains. They are a comparatively low type amongst birds, and show how inferior beings, attain in some countries a high and prominent place, and even clothe themselves in Imperial robes.

The *Notornis Mantelli* (Owen) allied to the water-hens presents also points of resemblance to the dipper (*Cinclus aquaticus*, Linn.) but it is as large as a goose. The great size of this bird, which belongs to an order which usually contains species of moderate or small size, is in harmony with the great development lower forms of life, receive in the islands of the Southern Hemisphere.

The coot (*Fulica ater*) inhabits similar localities to the moorhen, but confines itself more exclusively to the water. Its toes have little membraneous appendages, like the grebes and phalaropes. It is a type of the "fresh-water sailors,"—the marines; better able to take care of themselves on the water than landsmen, but poor artificers when contrasted with the able seamen, who are represented by the true web-footed birds. The coot is also a type of the river waterman, always *afloat*, yet ignorant of sailing tactics. He is often a mean fellow, not to be trusted like the honest sailor.

The grebes (*Podiceps*) occupy the same place amongst those with rudimentary web-feet, as the divers do amongst true web-footed birds. They have both,—for their classes, the greatest facility in swimming. Both progress under water at a rate truly astonishing. The grebes are the type of the coast-mariners, who have not the same facilities for acquiring a knowledge of seamanship as those who make long voyages, yet are nearly as much at home off the coast.

These birds' heads are ornamented with various devices, like those which sailors are fond of wearing, and which are certainly akin to the grotesque. These species are sleek-skinned, and their feathers on the breast and belly, are like the fur of the seal or Platypus. Grebe has become a fashionable article of dress, like seal skin. The attire of sailors was at one time fashionable for gentlemen, not of that profession.

It is important to notice how the various classes of water birds, show an analogy with the different orders on land. Thus the albatross represents the vulture; the frigate the eagle; the skua the falcon; the puffin the parrot; and the tern the swallow. The penguin that cannot fly, the ostrich; and the swan as the largest in body of the water birds, the cranes and storks, as the largest of land flying birds.

The swan is awkward on land, but on the water it is at home, and passes there a peaceful, quiet and inoffensive life; for its

size and strength render birds of prey usually unwilling to attack it. In human society, those who can effectually defend themselves, are the least liable to molestation.

The full-grown swans when they have access to plenty of clean water are beautifully white. They are nearly allied to geese, but have much more intelligence, and display greater attachment for their offspring than the rest of the duck tribe. They defend them with courage, and show wonderful instincts in the preservation of their nests. In one instance related by Mr. Yarrell, a mute swan (*Cygnus olor*, Boie) was uneasy without any apparent cause, and a great quantity of vegetable matter being at hand, she was allowed to place it under her nest, which the next day was surrounded by a flood, and would have been swamped but for the foresight of the bird. From this it would appear that "Special Providences" watch over birds as well as over men.

Swans' necks are of great length, and form "the line of beauty and of grace," which must exist in the curves of the body of every beautiful and graceful woman.

The Anatidæ so peaceful, innocent, and so thoroughly at home on the water, are a type of the commercial marine. Swans are the emblems of great shipping companies, and geese of the old-fashioned ship-owners, whose motions are led by "antiquated ganders;" while ducks, from the teal to the eider, typify the various coasting, yachting, trading and fishing craft; from the cobble to the good-sized merchantman. The white swan illustrates the modern clipper, whose passage through the water is so smooth.

The black swan (*C. plutonis*) of Australia which was thought in former times to have only "a mythical existence," is now abundant in menageries and ornamental pieces of water. But a few generations ago, steamboats with their black smoky sides were viewed as also impossible; but now we see them move along our rivers, as we do these dingy swans, whose red bills are like fire about the funnel's mouth.

The black-necked swan (*C. nigricollis*) of the far-off Falkland islands, appears to connect the black and white species, as their bodies are of a light colour, while their necks are dark. The white swan illustrates the clipper ship, and the black the steamer. This species with its red bill, typifies a vessel which combines the qualities of both craft,—the "clipper" with white sails, but "auxiliary screw" and fiery funnel.

Geese (*Anser*) are found in almost every country, different species being adapted to the hottest and coldest regions of the earth. Although it is the fashion to consider them the most foolish of birds, yet some species show a fair share of intelli-

gence, and they do not so readily as ducks, fall into decoys. Ducks are commonly more pretty and graceful than geese; hence "Duck" has become as much a term of endearment, as "Goose" is of reproach.

The grey-lag goose (*A. ferus*, Steph.), one of the largest species, is believed to be the origin of our domestic bird, and is most widely distributed.

"A wild-goose chase" is an unsuccessful one, therefore the bird cannot be so stupid in its natural state as to render it the type of a complete simpleton. The goose in its domestic state, although not possessed of its wild instincts is extremely useful. With the exception of its liver, it is despised in France as an article of food; but it is much valued for its feathers, down and quills.

The artificial manner in which it is fattened, excites horror among the tender-hearted, whose appetites are not under the influence of "*pâté de foie gras.*" In close, hot cupboards the poor geese are nailed or chained to the boards, and fed with a spoon, until their livers are swollen to a great size; while the rest of their bodies waste away. Geese become "*geese indeed*" when man makes them satisfy his morbid cravings, but in their native wilds, they perform the functions of the most sensible birds.

The eider (*Somateria mollissima*), one of the finest and largest ducks is a most interesting bird, from the habit it possesses to a greater degree than most of its tribe, of lining its nest with the down which it plucks from its bosom. The Laplanders visit its nest and rob it many times of some of its down, which the female continually replenishes from her breast. When she has exhausted this supply, the male assists her by stripping himself, and so a large quantity is eventually obtained of a substance valuable in commerce.

This habit of yielding support or warmth to offspring, shows analogy with the mammals; for although down is not food, yet by protecting "the flame of life," it acts a similar part. We are told that males of the human species, have been known to suckle children, when females were not at hand.*

The eider was called "St. Cuthbert's duck," from its breeding so largely on his sacred island. It yielded an ample return for its shelter there; but its numbers have been much lessened by the rapacity of those, who killed the parents of such precious down, in order to pluck the bird themselves. Had they been as wise as the Laplanders, they might have robbed the bird's nest three or four times in a season, and yet have maintained the species in undiminished numbers. Our ignorant,

* Carpenter's Physiology, 6th ed. p. 837.

degenerate population, although they have the possibility of rising to the level of the superior beings, which form the better portion of our nation, yet often show a short-sightedness and a recklessness, which the savages who live entirely by their wits, do not. Our artificial condition of society thus has its disadvantages and its drawbacks. The simple savage who does not attempt to soar so high as we do, cannot *fall* so low.

The mandarin duck (*Anas galericulata*), perhaps the most beautiful of the family, displays extraordinary attachment to its mate, and is said never to pair a second time. Mr. Davis relates that a couple of these birds were separated, by the male being stolen. The female showed great grief and refused the addresses of another male. A few days after, the former male was recovered and the pair were now happy; but the male whose addresses had been rejected was attacked desperately by the husband, who tore out his eyes.

This duck may well teach the Chinese a lesson in conjugal fidelity. Their husbands are sufficiently jealous of the invasion of their rights; but they do not set the example of chastity themselves. This bird reminds us of the Chinese in shape and appearance, having *a sort of tail behind the head, a prominent beak and forehead; a pigeon-breast with the wings on each side cocked up*, as when two swords are worn by a Mandarin. The costume of some grades of the Chinese mandarins consists of a variety of brilliant colours, the petticoat being of a small pattern; while the upper clothing is of a larger and richer design. Similar contrast of markings may be observed in the plumage of these birds.

The shieldrake (*A. tadorna*, Linn.) breeds in rabbit-burrows. The beauty of its plumage is its sole recommendation in the aviary, for like many ducks it is rancid and unpalatable.

The regard of some ladies for these beautiful though unprofitable ducks, these mere toys, which only possess attractions of plumage, is senseless and unprofitable. These ducks have their prototypes in the "Dundrearys" of the age.

The great northern diver (*Colymbus glacialis*), possesses extraordinary powers of swimming and diving. It shows great shyness and much cunning, for when it leaves the nest it covers its eggs and skilfully dodges its pursuers. It presents analogy with some beetles (*Dytiscus*), renowned for their diving powers and awkward movements on land. Sailors who move with so much facility on the water, have an uncouth gait on shore.

These birds illustrate the Greenlanders, who have like them a rancid odour, and who love fish and live on the water. But no human divers can move under the water with the rapidity of this bird. The *colymbus* dives into the recesses of the ocean,

and traverses regions at the bottom of the sea, which are *Terra incognita* to man. Could we follow it into its haunts, we should like Christopher Columbus, DISCOVER A NEW WORLD.

The guillemot (*Uria troile*) is one of the most foolish of sea birds, for it allows itself to be lifted off its egg by the passing hand. It makes no nest, and were it not for the pear-shape of the egg, it would roll off the narrow ledge of rock on which it is placed. This adaptation of form as a compensation for the low instincts of the birds, is highly important.

It is extraordinary that those birds which sit on a single egg, are the most numerous as species; such as the guillemot on the shores of Britain, and the penguins and petrels on other coasts. Their breeding places are little disturbed by man or beast, and as they live long, they may have a numerous progeny. There is every reason to believe, that no species of large vertebrate animal on the globe, is as numerous as man, and yet his births are mostly single.

The cormorant (*Carbo cormoranus*, Tem.) is a greedy bird, a type of those who devour as much as they can get. Its love for fish was turned anciently to great account in England, by its being trained to fish for a master. The Chinese also adopt this plan in the present day; the bird being afterwards permitted to fish for itself.

Those who make good servants, have *strong and violent lusts and inclinations*, which a skilful master turns to his own advantage: while servants who are merely amiable, and act to please and gratify others, are left behind in the more selfish chase for subsistence. *Strong self-interest*, is usually a more powerful inducement to exertion and economy, than the desire to serve others.

The pelican (*Pelicanus*) famous from remote antiquity, yields to few birds in interest. Except the swans and the giant albatross it is the largest of water birds. It is an excellent swimmer and has a powerful flight, but is awkward on land, and so dirty in its habits that the smell of its resting-place is perceptible from a distance. Its vast pouch can hold a great supply of fish; but it is willing to swallow any kind of flesh. Notwithstanding its uncouth appearance, it perches on trees with great facility, its plumage is beautiful, and an island inhabited by these birds is well worth a visit. The pelicans were anciently supposed to be the type of good mothers, who shed their blood to feed their famished young; but more correct observations have shown, that the bird for this purpose, only emptied its pouch.

The frigate-pelican (*Tachypetes aquilus*, Ill.) has analogy with light frigates of the most approved design, for they excite the

same terror in other birds that these ships inspire in smaller and less powerful craft. This bird hovers over the heads of the fishermen, in search of their finny prey. Numerous gulls and sea birds follow its movements, and when they see the net drawn they descend. The frigate allows the gulls to pick up the fish, but robs them of it when they rise into the air. In like manner our cruisers wait till the slaver has filled his ship, when they compel him to disgorge his prey.

The terns (*Sterna*) have remarkable powers of flight in which they resemble swifts, and like them breed among the rocks. They are good swimmers and remind us of those small yachts or pleasure boats, which are excellent for paddling or sailing. Terns are of various colours mottled white and grey with black beak (*Sterna hirundo* in summer), but others are entirely black (*S. nigra*).

The noddy (*S. stolida*) unlike the British terns is a stupid bird, for it allows itself to be knocked on the head or caught on its eggs. It breeds on the Tortegas and other islands of the Bahama group. The natives were very tame when first discovered, and like these birds were almost willing to throw themselves into the arms of the stranger.

The gulls (*Laridæ*) are supposed to be foolish and easily deceived, hence the appellation "Gullible." They swallow most animal substances, and are therefore valuable in a garden, to lessen the number of slugs and snails. Gulls are caught by means of baits placed on hooks, and drawn rapidly through the water after a boat. They are of different sizes, and vary considerably in plumage.

Gulls may be considered a type of the credulous amongst the seafaring population, who differ so much in degree.

The black-headed gull (*Larus ridibundus*) inhabits the freshwater lakes and the marshy parts of the coast. It is a type of the heavy unintelligent marshman.

The skua (*Lestris cataractes*, Ill.) is far more courageous and intelligent than any of the other gulls. It does not fear the great eagle as it approaches its nest, but flies round and attacks its head with such fury, that the large bird is glad to betake itself to another spot. The skua so greatly exceeds the eagle in swiftness, that without danger it may annoy the noble bird. The flock of sheep feeding in the neighbourhood of the breeding places of the skua, often enjoy immunity from attack, and the shepherds accordingly greatly value this species.

The skuas are a type of the inhabitants of the Orkneys, who are a most choice division of our population, and are not to be excelled in spirit and daring. The skuas are supplanting birds, for they feed on the fish caught by other gulls. When the

Northmen came they made the former inhabitants Fish and Work, but defended them against foreign foes.

The fulmar petrel (*Procellaria glacialis*) breeds near St. Kilda, and is a ravenous devourer of fish, it is one of the most numerous species extant, and when caught vomits a clear green oil, which imparts to the whole nest a peculiar odour. This oil serves to feed the lamps of the inhabitants of St. Kilda. It is a fierce bird, biting furiously when handled;—a type of the savage fisherman who is angry when meddled with.

The great wandering albatross (*Diomedea exulans*) has been called "the vulture of the sea." Like the condor it roams over distant tracks, but substitutes the ocean for the land. Its flights are the most long-continued of any bird;—it must sleep on the wing or not at all. It flies from the Cape of Good Hope to Cape Horn; from Cape Horn to Kamschatka, and from thence to Australia; making the circuit of the globe in search of fish. No human emigrants can do more than this in search of their food; and this bird exceeds the most approved cutter or schooner in tactics, being able to fly within two points of the wind. It tacks like a ship, and must be a wonderful sight when it flies with an almost imperceptible vibration, on wings extending seventeen feet.

Nearly pure white in body, with quills of dark umber, it crests the surging billows. The same bird, recognized by its ruffled feathers, has long followed a ship in hope of obtaining some offal. It has an immensely powerful beak, and as a tyrant holds all the birds of the sea in check, often killing them for food; although not classed with birds of prey. It breeds in the most inaccessible islands in the midst of the ocean; its nest being like the home of the pirate. But these birds are too large and formidable to be the types of pirates. They illustrate a large and magnificent ship of the line, found in every part of the ocean. The albatross breaks the ribs of other sea birds, as the great Men of War do those of smaller craft.

The stormy petrel (*Thalassidroma pelagica*, Vgs.) is a little bird swift of wing, that flies near the water. Its advent is considered a token of the approach of foul weather, and is therefore dreaded by superstitious mariners, as a sort of witch or goblin. We cannot doubt that in stormy weather these birds seek shelter in the neighbourhood of rocks, or about ships which they mistake for them when the sea is running high, and the waves as they break, appear like "the breath of a furnace." Their sooty plumage is suitable to birds of such evil omen; this colour having been in all ages associated with melancholy, smoke and destruction.

They are full of oil like the fulmar; and the natives of the

Faroe Isles put a lighted wick in their mouths, and use the bird as a lamp. This reminds us of the way witches were "put out of the land." They were made *to light up* the dark gloom, from the middle ages to the seventeenth Century.

The penguins move with a sort of running splash along the surface of the water, in which they use their wings, but do not properly fly, for they cannot support themselves in the air.

The Jackass penguin (*Aptenodytes demersa*) is a brave bird, and does not hesitate to attack the legs or arms of man, if thrust into its burrow; most penguins allow themselves to be knocked on the head with impunity. When on shore it walks on its wings and feet like a quadruped, and brays like a donkey; and has all the obstinacy of the ass. There is a king penguin as well as several other species. All sit on their tails in an upright manner, looking grave and solemn. They resemble the little men with long bodies and short legs, who are very UPRIGHT, UNINTELLIGENT, and utterly incapable of SOARING.

The gare-fowl or great auk (*Alca impennis*) much to the grief of men of science, is probably extinct in Iceland, Newfoundland and Labrador where it formerly existed.

The southern penguins represent the stupid South Sea Islanders, such as the natives of Chiloe or Terra del Fuego, some of whom are harmless fools, while others are fierce like the jackass penguin. But the penguin of the north,—the great auk, which we fear has ceased to be, was a type of the ancient races who probably peopled these regions, and whom a superior race extirpated. This extirpation also is to be regretted by Anthropologists, who are always sorry to lose INTERESTING OBJECTS OF STUDY OF THEIR OWN KIND.

CHAPTER X.

THE RESEMBLANCE BETWEEN MAN AND ANIMALS.

GORILLA — CHIMPANZEE — OURANG — GIBBON — UNGKA — APES — PIGMIES — MONKEYS — LEMUR — LORIS — WING-HANDED ANIMALS — DOGS, AND THEIR VARIETIES — FOX — WOLF — JACKAL — HYÆNA — LION — UNICORN — TIGER — LEOPARD — CHETAH — JAGUAR — PUMA — LYNX — CATS — ICHNEUMON — WEASEL — STOAT — POLECAT — SKUNK — GLUTTON — OTTER.

THE far-famed gorilla (*Troglodytes gorilla*) is usually placed at the head of great apes, and surely it deserves this prominence; for if it does not so nearly approach man as *Troglodytes koula-kama*, yet from its superior size and strength it stands first. Whatever may be said of the proclivities of some of the great apes to man, still we must admit that there is an enormous distance between him and them. There are but Three Empires in Nature, the Inorganic, the Organic, and the Moral. Man is the only example of the moral kingdom within our present view; for apes *are not* moral beings.

The gorilla, an inhabitant of Western-tropical Africa, was for ages imperfectly known to Europeans. It was formerly considered as being invested with almost supernatural powers, and is still regarded as one of the most formidable of brutes; for it triumphs over the lion, whom it can drive from the field. It has, united in its powerful frame, the strength of several men, and could it be the servant of man, it would indeed be an efficient one.

The gorilla does not eat man's flesh, but shows an extraordinary enmity to him, slaying him with the slightest effort as opportunity occurs. It delights apparently in disembowelling or strangling him, for it possesses the most powerful muscular apparatus amongst large mammals, in proportion to bulk, and its grasp is truly "that of a Titan." It comes stalking to meet man, erect and beating its breast with violence; the sound reverberating through the dark woods, occasionally mingled with a fierce yell, sufficient to appal those who are not more than lion-hearted.

The gorilla is untameably savage—the wildest of wild beasts,—man's greatest enemy among them: its hideous cry, is said

to have the power of "nailing him to the ground." It is the spirit of the gloomy glades, the original of the Satyrs—who mock at man's calamity with the hideous grimace of Satan, whom the gorilla typifies; but only in Satan's savage character;—his *shaggy coat*, not his serpent form.

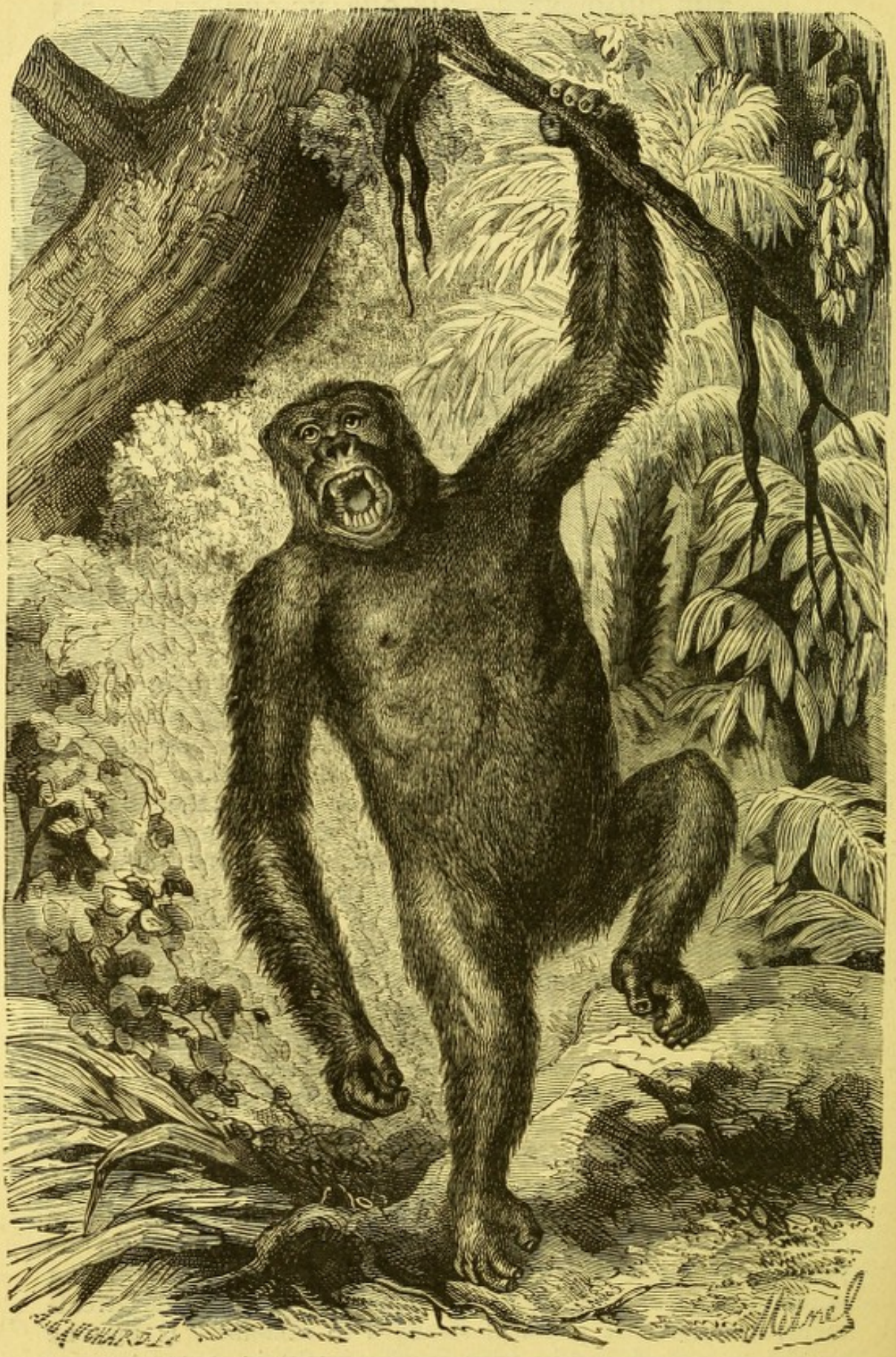
When we conquer the gorilla; survey his brawny limbs, "his villanously low forehead;" those superciliary ridges that scowl upon us even in death; or have seen that wide rough mouth gasp its last curse at man; we feel that we have indeed triumphed over an enemy who hates us.

The chimpanzee (*T. niger*) is much milder than the gorilla, and shows so many amiable traits of character, and so much intelligence, that we feel sorry our opportunities for observing it are so few. In the wild state it is savage indeed. It musters in large troops, and attacks the lion or man with great fury, using clubs and stones. If a man shoots one of them, its companions fly upon him in great numbers, and he can sometimes only escape by throwing down the gun, which the apes seize and break to pieces, as the author of the death of their associate. Having wreaked their vengeance on the gun, they appear satisfied and depart.

In the monkey tribe we see many imitations of man, who by attempting the performance of his actions, reflect ridicule on him. The Negroes in a savage state resemble the chimpanzees in their native wilds; and when under the influence of Europeans, they show an analogy with each other. Both are interesting from their quick observation, vivacious manners, and tendency to mimicry; but such only thrive in tropical climates, for if brought to Europe, they mostly become sickly if they do not speedily die. It would be as absurd to bring many Negroes to temperate climates, as many chimpanzees.

The ourang-outang or "wild man of the woods" of Borneo (*Simia satyrus*) is an immensely powerful creature; for according to some travellers, it rivals the gorilla in size, strength and ferocity. We consider their accounts exaggerated; the gorilla being probably an animal altogether unique in these respects.

The ourang of Borneo is not so erect in gait as the gorilla, and has more in common with the lower members of the monkey class. Its intelligence is not less than that of the chimpanzee; and the feats which have been related of its performance, are truly astonishing. It is capable of being made useful to man, who can fortunately by judicious treatment, turn its vast physical strength to account. It may be taught to pound paddy (rice in the husk) in a mortar, for hours together. It is a most interesting animal, and has great



THE GORILLA IN ITS NATIVE FOREST. Page 254.

imitative powers. To a certain extent it soon learns what is said to it, and nearly abandons its former ferocity.

It resembles the Dyaks of Borneo, who are so savage and remorseless in a wild state, but when under the ameliorating influence of such men as Rajah Brooke, show a power of adapting themselves to the exigencies of civilization, and display much that can give us pleasure, as well as of what we can morally approve.

The agile gibbon (*Hylobates agilis*), so wonderfully quick in movement, and able to perform feats of activity that set human imitation at defiance, is generally most gentle in captivity. In a wild state it exhibits none of the ferocity of the more cruel chimpanzee and its congeners.

Among human beings, we find that some of our most agile athletes, are kind and good-natured, and less nervously irritable than most men. Nervous irritability is seldom accompanied by great muscular strength, as was first rendered clear by Haller, who held "that the irritability of the muscular system, is not dependent on the irritability of the nervous system."

The class of men whom we think resemble this ape, are long- and strong-limbed; small-bodied; short-lived; dark-skinned and bright-eyed. Such have wonderful skill in balancing themselves, and appear to walk great distances and run rapidly with slight effort; showing much muscular endurance. They have few of the finer feelings that belong to the superior classes of mankind; little of that nervous susceptibility which accompanies searching intellects; not that willingness to sacrifice inclination to duty,—the tendency of minds greatly under the control of the moral faculties.

Such men are soon worn out; "the flame of life" burns at a rate too fast for long maintenance; it being *ever in proportion* to the rapid circulation, induced by a headlong career. The athlete who does not relieve his muscles by active cerebral action, the *counterpoise* of great muscular exertion; if not killed by accident, is worn out at forty. Such is the result of men attempting to live like apes, whose structure is so different; they only kill themselves.

The ungka (*Hylobates syndactyla*) is another active creature, but is far inferior to the agile gibbon. This monkey, like some others, walks in an awkward manner on a flat surface, but is very nimble amongst trees and those creeping plants which interlace them, like the rigging of a ship. They remind us of many sailors, who are quite at home among the shrouds and spars, but who shuffle along the road in a most laborious manner.

The faculty of imitation, is much more frequently exercised in copying gestures and grimaces, than in assimilating to those

higher morally, than ourselves. The natives of Singapore, like their ungka, endeavour to "ape" European contrivances, and succeed in picking up many European ways and tricks ; but these are of minor importance, since they do not imitate European morality. The great Malay race, to which these people belong, mimic the civilization of superior races, but it is mere parody—the sound rather than the sense—the gilded counterfeit, which possesses only a thin scale of the precious metal.

The Barbary ape (*Inuus sylvanus*), is a species of the widest range, stretching far to the East in India, and to the West in Africa. It is famed as one of the inhabitants,—perhaps the earliest,—of the rock of Gibraltar. The English nation is deeply indebted to this creature, for having given the alarm on one occasion when an enemy was at the gates of the fortress. These apes are—if we may believe many reports,—extraordinary imitators of man, gathering in troops to repel his attacks. They show great respect for any of their fellows that may be killed carrying away the body, and revenging the death on the assailant. They are formidable on account of their numbers, and they appear to obey the direction of a leader.

Apes have little place in Europe, the home of the great species is in Africa, or in the large islands of Sunda, where the population and fauna, show an analogy with those of the tropical continent. In the corner of Europe which most nearly approaches that dark land, within reach of the fiery sirocco, we find apes, probably imported from Africa, at a period coincident with the primeval peopling of Europe.

Outcast races are found alike in Asia and Africa, whose mingled cunning and trickiness, remind us of monkey-life. These are a near analogue of the Barbary ape, who keep with their own kind ; and while they surpass some races of a higher order, in observation of petty matters, and in power of imitation ; and can stoop to do what those of lofty stature cannot, yet seldom get beyond "monkey tricks."

The "Pigmies" were famous in classic story, and their combat with the "cranes," was a subject for the pen of Virgil. There can be no doubt that this story was founded upon some conflict, which actually took place between apes and birds. In early times when the habits of animals were much less known than they are now, it is not difficult to imagine how these troops of apes were supposed by writers at a distance, to have been of a small race of human beings. They were little as contrasted with the human inhabitants of the country, who by their side might have appeared "Cyclopean giants."

The pigmy ape of our day is an animal about twenty-four inches high, and is a great pest in the Carnatic, where it is

found; being very injurious to corn and rice crops, and fruit gardens. They go in large bands to attack plantations, which are not protected by hedges of the prickly pear; and to secure a safe retreat, they post one of their number on an elevated situation, to give notice of the approach of an enemy. He shrieks an alarm if danger draws near, and the whole troop has time to make its escape among the trees, to the inaccessible wooded hills.

The pigmies take the same place among apes, that "Tom Thumb" and other dwarfs do amongst men. His proportions are so insignificant, he is such a contrast to the gigantic specimens of human nature, that Man likes to contrast them.

When our minds are clouded by ill health, we are apt to think our blessings "pigmies," and our troubles "giants." But when we recover our equanimity, we perceive how that on the fair Earth the dews and rains of Heaven, raise a luxuriant crop of fruits and flowers and every appetite is satisfied. Then may our Pigmy troubles spoil the green garden. We may wish they were not there, but now we know how *small* they are. We have but to stir boldly and they vanish. Still they leave disorder behind, and this disorder gives us work; so we make our fences more secure and keep our troubles out.

The entellus monkey (*Semnopithecus entellus*) a native of Hindostan, is a species treated with divine honours. The Hindoos worship this creature, probably because it is so destructive to their property; fear being the principal means of ruling their minds. It commits immense depredation on their gardens and fields, but still they look on, and do nothing but cry, evincing the extreme of ignorance and folly. It is fortunately destructive to serpents, which is some compensation for the property it destroys.

The conduct of the natives of Hindostan towards those who do them ill in the animal world, to whom they sacrifice as Evil-Genii, explains the character of their minds; which cannot worship without *dread*. They are less capable than many nations of appreciating sound moral government. They have been the prey for ages of more spirited nations, who make a spoil of their fairest possessions, but also slay their serpent-like banditti, who like reptiles are apt to strangle them in their paths.

The monkey-tribe, including the apes and baboons are remarkable for curiosity, delighting to examine objects, in a very thorough and scrutinizing manner. They possess a power of balancing themselves, of judging of distances and recollecting countenances, which many higher beings do not. They have enormous muscular strength, are commonly vain and capricious,

and their power of mimicry, has caused the name "Monkey" to pass into a proverb.

We see men resemble this class of animals; they are mostly distinguished by dark skins, thin frames, low noses, bright piercing eyes, high cheek-bones, and long upper lips. They are quick to perceive and imitate, and soon acquire the tricks of trade. They are commonly much attached to their offspring; are active and know how to take advantage of others; are very little influenced by high moral principle, and yet keep within the law, and the usages of society. They are well spoken of by the world, because masters of its maxims, and quick to follow its ways. They generally rise in position, principally by trampling on others, often better than themselves; and who, by aiming higher, are unwilling to practise the tricks these monkey-like men adopt.

They have little benevolence or kindly feeling, and are always ready to take advantage of the defects or failings of others; for which they have an "eagle eye," but a mole's eye for their good qualities; except when they can turn them to good account. They value property much, but not so much as "the world's opinion."

The little ape-like men commonly rise with the aid of some great man, which gives them a high elevation, of which they endeavour to make the most; and look down accordingly on the less servile and impudent members of the human species. Lastly they are revengeful and distrustful, and are by no means to be trusted with untold gold. They occupy a higher position than they ought, on account of their mountebank tendencies.

Those monkeys which ride on the backs of larger animals, are like those little men, who profit by the labours of great ones. They are inferior in status, but often greater in elevation, being nearer "the skies."

Thus on the great elephant's back, the little monkey mounts, and although less powerful as a creature, is nearer heaven. But on the monkey's nose a gnat settles, the smallest of all, but highest;—and it can fly.

From the monkeys we naturally pass to the lemurs, a class of four-handed animals found in Madagascar. They are shy of man, whom they do not attack, yet are capable of defending themselves with great spirit, giving severe bites with their sharp canine teeth. They roam about in troops at night, roar loudly through the forests, but remain in their places of concealment during the day. Their food is fruits, reptiles, insects and birds of small species. They are easily tamed when young, and become attached to their keepers; but if irritated can inflict

severe wounds. They are very agile and graceful in motion, carrying their long bushy tails high in the air. They are more suited to our cold climate than monkeys, and are more gentle in their ways, but are not so amusing and intelligent.

We see in lemurs a resemblance to a class of persons not uncommon in society, who do not show the energy and quickness of the monkey-like men. Not being able to enjoy sunlight, they are apt to "turn night into day." This description applies to a class of foreign ladies, who are little abroad during the day; but as long as you feed them with flattery, or what is more substantial, they are glad to see you at their evening parties.

The slow-paced loris (*L. tardigradis*) inhabiting Hindostan, Ceylon and Java, is another nocturnal animal allied to the lemurs. It is so sluggish, that it is obliged to seize its prey when they are asleep; consisting of little birds, mice and insects.

In walking along the boughs of the trees, it fixes one hand steadily before the other, to make sure of its footing, and does not easily turn back. This mode of progression, is that pursued by the Dutch colonists, who put one foot slowly and cautiously before the other, and seldom turn back or miss their aim, however slowly they may attain it. They have colonized the countries inhabited by the loris, whose prey may be compared with the human aborigines.

The slender loris (*Stenops gracilis*), is said to have a double tongue. The upper tongue is like that of a cat's but smoother; the lower is narrow, white and sharp-pointed. As each tongue has an independent motion, they can be used singly or together. The double tongue greatly assists in catching its insect prey.

"Double-tongued" individuals in human society are not popular, and are dreaded for their malice and hypocrisy. The upper tongue of this loris which resembles that of a cat, typifies cutting speeches uttered in an open manner; while the second tongue, may illustrate "backbiting."

The wing-handed animals (Cheiroptera) are gloomy in habits, nauseous in smell, as well as loathsome in aspect. We do not wonder that in a superstitious age they were supposed to have affinity with the departed spirits of bad men. These are equivocal animals, winged like birds, yet not birds;—the link between two important orders. They are wonderful in habits, and are endowed with an exquisite sense of touch, conveyed to their brains through their membraneous wings; which receive impressions from the air, with almost as much delicacy, as a tympanum or drum of the ear. This extraordinary sensibility, is thought by some naturalists to be a NEW SENSE.

European bats are mostly insectivorous, feeding on the swarms of gnats that rise at sunset, and the moths that hover in the dusky shades.

Artists give wings with feathers, to divine messengers for good, but vampire's wings to those who watch us while we sleep, to do us mischief.

All spiritual messengers work out the Divine will,—a glorious end—whether they are gloomy and bat-like, and the glimpse we catch of them makes us shrink; or whether they are typified by "birds of good omen."

In Isaiah (ii. 20) we are told that when men leave off idolatry, "they cast their idols of silver and gold, to the moles and to the bats." Their idols are suitably resigned to these emblems of "terrestrial darkness," and celestial blindness—the mole and the bat; as a brighter light dawns on their minds.

The size of bats typifies the strength and power of superstition, which varies in different countries; some of which are so oppressed by it, that they may be compared with dark holes in which bats reign. These are surely the caves of superstition. Light but dimly shines when introduced, as does a torch into the home of the bats, which endeavour to extinguish it, as they flit in terror round, and pollute it, as they do its introducer.

Throughout the East, the bats darken the chamber lights, in many an old and damp building; especially in India—"a benighted land." There the bats reign in nearly all the Temples. Hardly a house but has many bats,—"the messengers of darkness." But they will leave us as civilization *enlightens;* they cannot bear the daylight, like their types the Evil-Angels; who are much greater in power than unaided Man. Like bats they can raise themselves above the earth, which man cannot.

Throughout the gloom the bats reign; we only see them in the twilight, but their greatest power is at midnight:—such is a type of a period of gross idolatry. All countries go through night and twilight stages. Such appears in many temples, the *"light" is there "subdued;"* the people led by bat-eyed priests are kept in gloom.

In England and in Europe, the bats are *smallest,* and the inhabitants are more enlightened; but in tropical America the bats are of great size, and sometimes feed on blood. In the islands of Sunda and Madagascar, they are large and mischievous. In all these countries, the inhabitants are plunged in gross superstition and idolatry. But these idolaters have not within the memory of man had the "daylight of truth." As they come in contact with the great Western light, its twilight comes upon them: the daylight follows without break; but still the darkness which precedes the *dawn* is grossest.

All these changes roll round the moral world. First it is TWILIGHT; then THE NIGHT, afterwards TWILIGHT: last THE DAY.

Bats are important as illustrating the position in which the spiritual world stands to us. They are intermediate between birds and quadrupeds. The types of the three classes of moral beings—the Divine, the Angelic and the Human.

The horse-shoe bat (*Rhinolophus ferrum-equinum*) is formidable only to moths and beetles, which are but a type of what is so much dreaded in less favoured lands than ours. Some persons like "moths" and "beetles," *flutter round the candles of the priests.* These are the "prey of superstition," as the insects are of the horse-shoe bat.

Our ancestors nailed horse-shoes to barn-doors, as a means of preventing the visits of the "evil one," this indicated a "wholesome," although unreasoning dread of witchcraft.

The rousettes (*Pteropus rubicollis*) of the moderns, are doubtless the "harpies" of the ancients, which were described by them as fierce monsters, rapid in flight and fetid in smell, polluting everything they came near. Such according to ancient story, were sent by the gods to punish the blind Phineus. Their faces were lean, and hungry was their aspect; which if we accept classic fable in this case to illustrate fact, would lead us to think of those who subsist on the food of others, and leave them without provision, destroying even what they cannot devour. Of such are many thieves, who in order to rob, destroy and defile the property of the poor.

The kalong bat (*Pteropus javanicus*) feeds exclusively on fruits, plundering alike, the garden of the poorest peasants of their common and coarse produce, and the sumptuous gardens of the chiefs and nobles, whose trees are covered with the choicest fruits.

The Malay thieving population of the Sunda Islands, who live on the spoils of the respectable citizens, cannot be extirpated.

Pteropus edulis, while it plunders the natives, gives them its flesh in return, which is some consolation for an orchard robbed. This is an instance of just compensation, made for injury done to property. Those who rob the community, should be made to pay in person or in pocket.

The "*fer de lance*" like the vampire, has a nose in the form of the point of a lance, which is suitable to a creature of blood-thirsty habits. We wish all human cutthroats had a similar distinguishing mark.

The true vampire (*V. spectrum.*) is a creature from which we shrink with extraordinary disgust and horror. Hovering over its victims with quivering wings, it descends, and fans him

gently, as it breaks his skin and draws his life-blood. Its appearance is sufficiently revolting to most Europeans, but the natives of tropical and South America where it is found, do not so much dread it.

The vampires resemble the priests who have so long "sucked the juices of the state," and so well know how to soothe "the national conscience" to sleep, as they draw its substance. Vampires are very abundant in Chili and there the priests also have much power. In their midnight festivals, they deaden the conscience with mummeries, like the undulations of the vampire's wings.

Some feel not the vampire's bite, yet when they wake, recoil with horror; but may exhausted, go to sleep again,—be fanned, and their blood drawn again; until worn out they expire.

All vampires are not equally destructive; there are large and small species, and they can live on other food besides blood.

Let stringent laws be passed to keep human vampires within proper bounds; and let them *be made* to cultivate waste lands in their respective countries. Then the moralist may be reconciled to their presence.

The varieties in the breeds of dogs are great, possessing as they do many distinct characteristics, perhaps as many as the occupations and characters of their masters.

It is curious but true, that dogs which are much with their owners, often resemble them somewhat in expression; which adheres to them even when they return to their compeers. Sir Edwin Landseer has most ably depicted an assembly of dogs, illustrating the characters of men, in his wonderful picture of "Laying down the Law."

The mastiff is in some respects a noble dog. He is forbearing to small dogs, scorning to attack them. He is fearless in fight and capable of tearing a man to pieces, and unites courage with strength in a great degree. To his master he is almost always faithful, but to other persons he is often surly and fierce.

Those persons who are square in build, have mouths drawn down at the corners, and daring stern eyes, are often like the mastiff in character. Such a style of countenance is not very uncommon in England. Under a considerable share of moral restraint, these persons are generally faithful to their employers, but very gruff in manner even to them. To visitors they do not like, they are even more disagreeable, grumbling and showing their large and prominent teeth like a surly dog. Hospital and workhouse porters, relieving officers and parish clerks, sometimes have this style of face. They are often useful, from the

extraordinary animal courage they possess; are always prepared to attack, and have indomitable vigour in defence.

We shall describe male and female examples of this character of man.

They were born in Yorkshire. The boy at the age of fourteen years, was taken into the stable of a country gentleman. He was honest and straightforward, and detected the old groom selling his master's corn. Of this he informed his master, and the groom of twenty years' standing, lost his situation. The boy got an awful amount of abuse from all the servants of the establishment, but he just shut his mouth and growled. At twenty he had the entire charge of the large stables.

He was six feet high; and stout and muscular, with high-cheek bones, and an excessively broad and massive bony chin. He had two long projecting teeth in the upper jaw: ordinarily his mouth was firmly shut. His head was flat on the top, and rather square on the sides, in accordance with his whole build. When he opened his mouth, he spoke with great decision and force, and was not to be taken advantage of in a bargain, for he was very exacting, and could silence most persons with a volley of abuse. Ordinary men obeyed his very look, and his word, known frequently to be followed by a blow, inspired terror in the stable-boys.

He would not be interfered with by any one but his master. Not even the collector of rents had any influence over him; and the man, although an attorney, was obliged to put up with insolence from the trainer of a stud. He was otherwise a decent and respectable character.

His sister was as formidable in her way, as he was in his. She was the matron of a female Reformatory. She was five feet six inches high, heavy and muscular. She was very strict and insisted on implicit obedience,—the strictest adherence to the very letter of the regulations, and punished breaches of order most severely.

She was the only matron in an institution containing about fifty girls; but it was better conducted than several other institutions, which had double the number of attendants in proportion to the inmates. Her rule was only relaxed, when those under her care were prevented by actual incapacity from fulfilling her commands.

She was not reckoned unkind, but ruled by fear, and not by love. The servants who came out of her establishment, were noted for their respectful manner; hard-working, and cleanly habits. Her style of countenance resembled that of her brother; square in chin and firm in lip. She had a loud, thundering voice, that could be heard all over the house.

Like the mastiff, her offspring were few, but very formidable, and her only son became a first-rate drill-sergeant of infantry.

The bull-dog is more exclusively devoted to fighting than the mastiff. It has immensely high cheek-bones, a comparatively square forehead, broad chin and flat nose : its eyes are daring almost beyond expression. It is always ready for a fight against any odds, as its self-confidence is immense. It is not fat, but from the size of its muscles appears stout, and it is rather short legged. It does not bark so much as other dogs, but rushes on the foe with great fury, and holds on with a pertinacity that only death can conquer. It is the fiercest of dogs, and its courage in proportion to its strength is prodigious ; and as this is great, it rules amongst the dogs, and drives almost all of them before it.

"John Bull" is supposed to be a powerful animal, but even he is held in check by the British bull-dog ; small compared with himself, and of insignificant strength.

We remember a little man a sprig of the "British weed called law," a stout, strong fellow, though not much above five feet high. His expression resembled that of the dog in Landseer's picture of "Low Life," and like that animal his mouth had a slight twist on one side. He was light haired, had powerful limbs, and was pre-eminently ugly ; for he had hardly any nose.

We were told that as a boy he showed little skill at marbles and other games, but generally got the largest share by pure bullying and insolence. As a lawyer he was always ready to to take up any cause however bad, if it held out the least prospect of success.

He courted a woman about six inches taller than himself, rich and good-looking ; but who for years regarded him with the greatest contempt. He still persevered, and having once got a footing was not one to draw back. They were married, and for several years he repaid all the insults she had bestowed on him. He was very exacting. As an instance of this he purchased a house in which a highly respectable gentleman was located. The gentleman received notice to quit, but stayed a day over the term. The lawyer sent in a demand for the quarter's rent, and not being paid put in "a distress," knowing that the gentleman was away from home. The gentleman brought an action for trespass and got damages from the bull-dog lawyer. He was also nonsuited in two or three cases, in which he was personally concerned. About the same time he was seized with an illness, and died at length of chagrin.

Bull-dogs when they cannot get what they want, and are too much confined, sometimes pine away and die.

It was interesting to watch the way in which the little lawyer treated cases; he would quietly wait until an individual was fairly committed to a course, would then rush in like his canine prototype, and hold on, until the foe was subdued.

The greyhound is one of the hunting dogs, and shows a singular resemblance to many of those who train it; being entirely occupied with the chase. It is the swiftest of dogs; is agile, clean skinned, and has an elegant contour. It scents game with extraordinary quickness, but is much less capable of understanding what is said to it than most other dogs. It has also less affection for man, and is apt to snap suddenly at those near it; but barks little.

We remember an individual who answered in many points to this description. He was long-limbed, long-nosed, and long-faced, and certainly not ungraceful. Without being addicted to any positive vice, he was one of the most unprofitable members of society. He cared little for mental cultivation. He practised no art, and read only racing calendars and sporting newspapers. His whole thoughts were given to training dogs for the chase during the summer, with occasional fishing. Winter-time was his glory. His powers of walking were marvellous, and he could ride fifty miles a day after the hounds. He did not care much about business; there was a sad want of order and regularity about his movements; and he could not be depended on for punctuality.

When ill he generally fancied himself a great deal worse than he was, and could as little amuse himself with things in general, or feel at home in doors, as one of his greyhounds. His observations of size and locality, were remarkably keen and exact like those of that animal. He was generally taciturn, and had a difficulty in expressing himself fluently or with precision.

The bloodhound is a splendid animal, but has little general intelligence in executing commands. It has a most powerful, deep and sonorous bark, which makes the whole ground shake. It has a fine, clear, fierce eye. Untiring in pursuit, at the bidding of its owner, it follows the scent indicated, with an extraordinary pertinacity.

It is not the strongest of dogs, and has little generosity or love of mankind; it seeks only blood. Like many of the Indian tribes of "the far West" in North America, it is nearly extinct. They resemble the bloodhound in their thirst for human life, extraordinary skill in tracing and distinguishing trails, with that fine, wild, ferocious aspect, which sometimes characterizes the true savage. Like the bloodhound they can be enlisted on the side of a white master, yet lose none of their

native ferocity; and like him they are more pleasant to read about or see under restraint, than to encounter at liberty.

The poodle was thought by Sir E. Landseer to resemble a judge in his wig, and as such, is represented in "Laying down the Law." The poodle is wonderfully intelligent. The tricks that he learns, exceed what can be taught to any other canine variety. He is the actor and mountebank amongst dogs. He has been taught to fire cannon, to personate a sham fight, to feign death, and to take part in a siege. He possesses certainly more power of mimicry than any other dog; but has much less power of adapting himself to a useful purpose. He is an indifferent mouser, ratter or rabbit-catcher, and is even inferior as a watch-dog, to the small and feeble spaniel.

The low-class actors among men, are equally useless. They can mimic the occupations of others, but cannot be steadily useful themselves.

The Skye terrier is a strong-smelling, dirty dog in its habits. It possesses extraordinary intelligence and great energy for its size. It can hunt the otter with success and is a useful, interesting little animal. It has lately been the fashion to visit its haunts, for it has long taken a high rank in the market.

It is like the dirty, but thrifty and enduring Highlander, who has been so much admired of late, yet can be greatly improved by the use of soap and comb, like his shaggy compatriot.

The Pomeranian fox-eared dog, and the Esquimaux dog, have a strong likeness. They have acute powers of hearing, but have less domestic affection than most other dogs. From the facility with which they act together, they are of great use in the countries where they are found; but they show a good deal of the craft of the fox, and none of the nobleness that some of our other dogs exhibit.

Finnic or Hyperborean races of men, show strong analogy to these dogs. Crafty, wide-headed, flat-nosed, and oblique-eyed, they display much less attachment to their offspring than other varieties of man, and have less power and are of less importance than most other races. They live almost wholly on fish.

The English toy-terrier is a spoiled creature of fashion. It is the most useless of dogs, and a fit companion for the most useless of men. It occupies attention which might be better bestowed; it engrosses affection which might be better directed; it eats what might feed higher animals and in all respects leads a spiritless life.

Born on soft cushions, fed on creams, steaks and oysters, it is caressed until it loses all care for those who do not caress it. In youth it is rightly named "Frisky," but as it advances in life, fat the offspring of indolence and overfeeding, induces laziness

and disease, until it dies before its time, perhaps without posterity, and unlamented except by its mistress.

The Dalmatian coach-dog, neat, clean, fond of horses, dressed in showy bicolored uniform, fierce to strangers, is more for ornament than use. Like the footman whose portrait appeared in *Punch*, who asked the question, if he was wanted "for work or ornament," he is admired in the kitchen and the stable, and follows his master's carriage, or rides on it. He cares for little that is profitable, still less for what is exalted. He is obliged to keep himself clean, but his food and drink are his greatest pleasures. He is surly to those who are less well dressed than himself; yet is useful and necessary in his proper place; but if he steps out of it he seems offensive.

The Turkish or Tartarean guard-dog, is a grand variety, immensely powerful, and more formidable in conflict than any other. They guard the flocks from the attacks of wolves and bears.

They may be compared with the Caucasio-Mongols, who defend the effete Georgian races from the typical "wolves and bears" of pure Mongolic descent, and are magnificent men; vast in size and prodigious in strength. They can bear more than most races on earth.

The St. Bernard is a powerful, noble, generous variety, having an apparent affection for mankind, and possessing the greatest amount of tractability in proportion to its strength, of any dog, except the Labrador. From its utility in mountain ascents, it might be a member of the "Alpine Club," and few members of that body have been the means of saving more lives than some of these dogs, for they are true *avant-couriers* in times of danger. It must however give the first place to that acknowledged "member of the Humane Society" the Labrador or Newfoundland breed, which appears to have qualities, nobler in some respects than many men. Some have been willing to sacrifice their lives for their masters, or even for strangers in distress.

They resemble in character, a class of Englishmen, who are tender to children, humane and gentle, anxious to save life, and not sparing of their own.

The Russian setter is a rough curly dog, excellent for beating game, but has little ferocity of disposition;—the killing part must be done by other dogs. They are not allowed to eat the game which they assist in procuring. They resemble the rough foresters who are not allowed to kill game themselves, but drive it towards a given spot, to be slaughtered on the occasion of a grand *battue*.

These dogs have many excellent qualities and are not inferior

in intelligence, to those varieties which usually bear a higher price. They can be turned to a greater variety of purposes than most other hunting dogs; like the Russian peasant who is often master of several trades.

The colly or sheep-dog is knowing beyond other dogs, and its intelligence is of a useful kind, more so than the lap-dog, who can proverbially "do everything but speak."

On the desolate Scotch mountains, it tends the gentle sheep; or in the vale where the broom grows. Hardy, undaunted and courageous, it is the most single-minded of dogs, and shows great capacity for everything connected with its business.

It may be compared with the docile Scotch peasant, hard working, indefatigable, shrewd, knowing, and with an indescribable twinkle in his "e'e."

The colly is often a shabby and dirty-looking animal, but is yet so intelligent, and the more favourable specimens so valuable and trustworthy, that we are inclined to place it as we do the Scottish peasant; at least on an equality with the sleeker and more orderly English mastiff, and his analogue the English bailiff or porter. For he is much more self-denying, thrifty and acute, than his English brother.

The sheep-dog is said to be unsympathizing with his species; which is partly owing to the way he is brought up. Isolated at an early age from his kind—suckled by a ewe—and devoted to a particular employment, all his sympathies and energies are given to it. He has little in common with the smooth town dog, so well fed, fat, and inclined to sensuality.

The Scottish peasant has little sympathy with the English labouring class; he is more thoughtful, knowing and pawky; but is considered mean and queer in habits by his Southern compatriot. Self-denial is more easy to the better class of Scottish peasantry, but the English in general, glory in spending their resources as fast as they accrue.

The sheep-dog is a cross between two breeds, and in this respect it resembles the Saxon-Gael to whom we refer, and combines like him the qualities of two races. He is the foster child of a more numerous race, individually weaker than himself; but being numerically superior, they absorb him.

The naked dog of Guiana, is a feeble, unintelligent, spiritless little animal, suited to an enervating climate. It is the companion of that sickly effeminacy which characterizes the weak races of South America.

These human and canine varieties seem destined to *give way and disappear*, before a CLOTHED, HAIRY AND STRONGER RACE OF MEN, and A MORE USEFUL and ENERGETIC BREED OF EUROPEAN DOGS.

The Blenheim spaniel, is a very pretty dog but nearly useless, except to please the more empty-headed members of the fair sex. It usually has its tongue out, a sure sign of a long one. It is the spoiled child of luxury, the companion of vanity and the sport of what is trivial. It is like its mistress in many respects, sleek-skinned, and attired in a silky robe. She has everything done for her. Her hair is combed by her maid, her meat is cut up for her and the same carriage appropriately contains her dog and herself. She is spoiled by fortune or rather by its abuse.

The Blenheim spaniel is more inclined to waddle, and less snappish than the terrier. Like its mistress it uses its long tongue in noisy demonstrations in other persons' premises, and is as little welcomed, though equally caressed and flattered.

The King Charles's dog, is delicate, small, and elegant, but has a flat nose. It is highly intelligent, and excels most dogs in its capacity for learning tricks. It does not want spirit for its size, and is extremely watchful. It is the greatest contrast to the bull-dog, the impersonation of animal courage and ferocity, with the least fear of danger. The King Charles's breed, has none of the nobleness of the hound or Newfoundland.

High-nosed races amongst men, are commonly independent, and have a certain repugnance to what is low; so amongst dogs which have long high noses, they do not show the pliability of the spaniel or "King Charles," such being inconsistent with their single-minded characters. The sheep-dog, combines the high nose of the hound, with the round-headed characteristics of the King Charles, and so has two characters.

The King Charles has its analogue in the small, weak-muscled, nervous, delicate, but accomplished individual, whose intelligence and accomplishments benefit mankind little, on account of deficiencies in physical force and single-mindedness, and partly from not having been in circumstances to develop an independent character. These men are more amusing for a leisure hour than useful; more fit for the drawing-room than for the field of active usefulness; and although acknowledged to be clever, are apt to become plethoric and sensual in prosperity.

The Italian greyhound is an importation from Naples in Southern Italy. Graceful above every other dog, it is delicate, and its highly nervous temperament, renders it particularly sensitive to cold. It was probably a superior breed originally, but has degenerated. It is a special favourite with the ladies, but has been much overrated.

The high birth and polish of the nobles of Southern Italy, make them ornamental to society; but their indolence, igno-

rance and uselessness, render them of as little value in their sphere, as the Italian greyhound.

The pointer is the most intelligent of sporting dogs, and enters with spirit into the chase. He ranks above the setter, and is trained not to kill the game for his own eating, but to act at the bidding of his owner. He finds the game, and is followed by his master who kills it.

As the setter shows analogy to the mere beater of game, so does the pointer to the gamekeeper, who finds the game for his master to kill.

The fox (*Canis vulpes*) is a cunning and vicious specimen of the genus Canis. Cowardly and treacherous, it never attacks any animal as large as itself, and is extremely injurious in well preserved districts. It is wide round the ears and has oblique eyes.

Men with this configuration are apt to be "foxy" in their habits, and their ears stick out, much like those of this animal. They are disagreeable to deal with, and are never straightforward, but are given to double dealing. They seldom do anything without a bribe, and though they preserve a smooth exterior, slyly destroy the very bowels of society.

The fox is cosmopolitan, so it cannot be entirely extirpated,—let it continue an *example of cunning*, to be hunted down in every country, and driven out of localities where it can be most injurious.

The "fox earth" is a deep hole dug by the animal itself. It has generally a way of escape, often having two holes to its lair, which a more straightforward animal would not think of.

The wolf (*Canis lupus*) is the most ferocious of the genus. Larger than most dogs, it combines the treachery of the fox with great strength and hardihood. It is nocturnal, and stealthily approaches its prey, unless maddened by hunger. In winter they assemble in large packs, and frequently do not hesitate to attack with fierce cry, any living object they meet. They creep down from the mountains upon the sheepfold or the unwalled villages.

Scripture and classic fable, alike accept the wolf, as the most powerful illustration of some of the least amiable traits, seen in human character. "Benjamin shall ravin as a wolf; in the morning he shall devour the prey, and at night he shall divide the spoil" (Gen. xlix. 27). This is singularly applicable to the habits of the fierce Affghans who call themselves Benjamites. Wolves and Affghans come down on the villages and unwalled towns, slaughter and destroy in the morning, and in the evening riot over their plunder.

Wolves are considered the scourges of the East, and destroy more human lives in Hindostan than do any other beasts. The wolf in sheep's clothing, a Scriptural and classic parable, is applicable to our own age. The wolf dressed himself in the skin of the sheep, and was for some time unperceived by the shepherd; although he slaughtered many of the sheep. At last he was detected, caught and hung with the sheep's skin still clinging to his back. The analogy drawn in Scripture is sufficiently striking, between the wolf who clothed himself in sheep's garments in order more effectually to plunder the sheep, and those who enter the church on false pretences.

The wolf in sheep's clothing, may for a considerable time escape detection, but when he is discovered, the indignation against him is in proportion to his formerly supposed innocent character. His position becomes untenable, and he is "cut off like an unprofitable branch," or exalted on the "tree of infamy," a perpetual witness to condemned hypocrisy.

The jackal (*C. aureus*) the most cowardly of beasts of prey, is ever on the look out for the most helpless animals. It is not particular in its choice of food, but wherever the dying, the sickly and exhausted sheep are, there it goes. Where a carcase is being torn by large beasts of prey, there it delights to howl; the meanest of them all, more craven than the fox or the hyæna.

The jackal is said to be the lion's provider and to act in concert with him. The jackal eats what the lion leaves. Where the "British lion" roams, from the Hindoo Koosh, to Cape Comorin, where he marches to the battle-field with his trumpet roar, there the jackals, or native Allies howl. Vultures which from afar watch the slaughter, approach as the lion leaves its prey, and flap the jackals with their fetid wings.

These vultures remind us of the camp followers, who grow rich on the battle-field. They strip the slain, and hasten the exit of those departing from the world.

These robbers are often so encumbered by their ill-gotten booty, that they have a difficulty in travelling, they are like the vultures gorged with carrion, which can fly but slowly. If these camp followers stray behind the army, they and their spoil may fall into the power of a skirmishing foe; and are as helpless in his hands, as those bloated birds of prey. Yet these vultures and camp followers, may assist in keeping the encampment clean, and thus tend to the general good.

The hyæna's (*Hyæna striata*) aspect is repulsive. Malign, inexorable, and untameably savage, its eyes shine like lucifers in the dark night; its stealthy, dusky form surprises us. The courageous man fears it not. It fears the light of day, and

strangles what is weak and straying from the path. It mocks its prey with a laugh!

We once saw one in human shape, whose physiognomy and expression somewhat resembled this ferocious beast. She was clad in grey! her hair was grey! her eyes were grey! they had no womanly softness, no tender sentiment, no exalted emotion! She had little human sympathy. She had a gross fondness for her offspring, but did not desire their moral good, and would howl "when they left off breathing and no more." She had no love for virtue; or pleasure in good deeds. She held her tongue until she saw the virtuous err, and then her mouth was open, and a hideous laugh displayed her glee.

The lion (*Felis leo*) in Proverbs is said to be the "strongest amongst beasts," he is certainly one of the most powerful in proportion to his size. He has been accepted as the emblem of strength amongst Oriental and European nations. The lion was on the standard of the tribe of Judah, to typify the ruling character of the tribe, which gave Kings to Israel. The Jews are not the most numerous, but in proportion, are among the most influential of men.

The lion as a beast of prey, is of little value to man, and typifies the violent and lawless amongst governors; as many of the Kings of Judah were. They may well be contrasted with the ox, the emblems of the Tribe of Ephraim and its rulers.

The lion can seize and subdue, but cannot assist in the cultivation of the land. The Jews have been for ages, celebrated for their grasping tendencies, and for their comparative dislike of agriculture.

The animals which are found on the British arms, illustrate our national history. The unicorn which formed the support of the Scottish arms, was said to fight long with the lion; a contest typifying that between England and Scotland. The conflict ceased, and the forms of these animals were taken, as the heraldic supports of the crown; the first place being given to the lion.

The unicorn of the Authorized Version, or *R'em* of the Hebrew Bible, was long of doubtful identification. It was thought to be a one-horned animal, in accordance with the Vulgate: an error which arose, from the idea of it being taken from Egyptian monuments, where it was represented in profile. But there is every reason to believe that the "*R'em*," was a two-horned, wild ox, which had been long extinct in Palestine, and was known only from description.

A creature with one horn, represents half a nation, such was the unicorn, as the emblem of Scotland before the union. The heraldic supporters of the crown being still retained, typify its

maintenance by the two divisions of the nation. But the glory of the country, is mainly derived from the energy and industry of her people; who are represented by the bull, or ox with two horns.

A human being whose chief excellencies depend on his resemblance to a prime ox, is the admitted type of an Englishman at home and abroad.

Some men show an actual likeness to the lion, in having shaggy hair about the forehead, stern, daring eyes, and stiff whiskers, which do not hide a grim mouth. Their foreheads, noses, chins and shoulders are broad. They are also like the lion in character, being daring yet magnanimous, as lions are said to be. They are more powerful than agile, less crafty than vigorous;—which qualities, are accompanied by minds more logical than critical.

Such was the character and appearance of Daniel Webster, who earned in the United States, the nickname of "the Lion of the North."

The tiger (*F. tigris*) is lean, smooth-furred, lanky, agile, full over the eyes, wide-mouthed, slant-eyed with immense muscular power, but less weight of limb than the lion; yet can do more execution, being superior in activity. It is of a ferocious, savage, revengeful and treacherous disposition. As it seizes its prey its face is lit up with an expression inconceivably horrible. It glories in slaughter for its own sake, even after its hunger is satisfied. The lion is not like this; although it doubtless owes part of its character for generosity to laziness; or more exactly speaking;—the temperament of the lion though more powerful than that of the tiger, is more sluggish and difficult to rouse. Showing the analogy to men of lion-like constitution. Men of the tiger-like constitution on the contrary, by their restlessness as much as by their energy, make themselves notorious. They mostly value human life little, and are willing to sacrifice it, whenever revenge, fancied right, or love of show and power prompt.

Notwithstanding a certain gracefulness of appearance and magnificent demeanour; they, like the tiger, repel caresses at once. We admire them to a limited extent, but we detest their motives and their actions. They may tolerate those who submit to them, but woe betide an enemy in their power.

Tippoo Sultan took this animal for his ensign, and endeavoured to be like it in character. He was fierce and tiger-like, and his end was worthy of a tiger. He fought desperately to the last.

The leopard (*F. varius*) is a fine animal; as restless and active, yet smaller than the tiger. Its spots are of two tints;

dark and fawn-colour; a combination emblematic of a twofold character, one cunning and treacherous, and the other daring and bold. It is thirsty for blood, but does not care so much for flesh. Like the Mongolian robber tribes, it appears to take delight in slaughter, especially human. The leopard is said to prefer human blood.

The tiger and leopard are surely graceful, elegantly formed and magnificent animals; but with all their great beauty their aspect is unpleasant. Such is the case with some men; they are graceful and gifted with great personal attractions; yet the physiognomist shrinks from their touch, as from an evil spirit.

The leopard in Scripture, is an emblem of the Grecian Empire; the third of the great kingdoms of the world, mentioned by the prophet Daniel. Its progress was like that of a leopard, bloody and rapid; but its dominion was short-lived, like most "careers of blood." A rule of this character cannot take deep root in a country, it may destroy, but cannot hold steady possession. Like the leopard it sucks out the blood, and leaves the carcase to putrefy;—a prey to others.

The chetah or hunting-leopard (*Gueparda jubata*) is a small and elegant species, capable of being a servant to man, as its ferocity, cunning and daring, can be made of use to him. Always wild and savage; it sometimes finds a master whom it will obey, as long as its thirst for blood can be gratified. It is trained at last not to devour the prey without permission; like the fierce Kabyles when disciplined and under the guidance of a ruler of a stronger race. The man and brute hunt together. The master on his stately camel, watches the bounding deer, hemmed in, and at last seized. Its throat is bit by the growling brute, which drags it to the camel's feet, leaving a bloody track behind, thick with the deer's and chetah's hair. It is called off its prey;—the bowels of the deer are dug out, and thrown with its best blood at the assassin's feet.

The Zouave-regiments are as pitiless as the Chetah. Their civilized officers lead them on the foe,—perhaps as helpless as the deer. We have an instance of this in the story of the Cave of Kantara, where those imprisoned therein were slaughtered as they attempted to escape. The treatment of prisoners in the hands of the Kabyles, too often resembles that of the wounded deer in the claws of the chetah. When brought into the presence of the *commandant*, they are frequently put to death for the satisfaction of their captors.

The jaguar (*Leopardus onca*) stalks to the marsh, and crouching down till morning, behind a tall bush, waits until the buffaloes come to drink. When within springing distance, it

puts forth its greatest strength upon a leap, towards a buffalo. Successfully it grasps the back, and tearing at its throat, the crimson stream springs forth. Still the jaguar tears and licks the blood, as the creature flies with fury through the forest glades. At last the buffalo turns back, and rushes to the water's brink, and there falls!

The Caraibs of South America, blow their darts from behind some tree upon the passing traveller. The poisoned arrow pierces his flesh; the burning wound makes him long for water; he cannot stray far, but dies perhaps on the brink of what he hopes will quench his scorching thirst. He is soon stripped by the savages, and thrown on the stream,—a breakfast for the alligators.

The puma (*Leopardus concolor*) of South America, is an active, strong beast, but not so large and powerful as some of the feline tribe. It is cowardly and cunning, but is the ruler of the beasts of prey in the far South of America. Like most cowards it attacks the helpless, but seldom ventures to assault a courageous man. It is called a lion, but is more like a lioness, not having the mane.

In harmony with "a less vigorous fauna," than that in corresponding latitudes of the Old Continent, the Natives of South America have *no* beards.

The puma has little nobleness of disposition, and has less courage for its size, than any of the cat tribe; ostriches and guanacos are its principal prey.

The Republics of South America, affect the airs of Great Nations, but lack the courage and strength, the vigour, nay the noble appearance of the stronger nations of the Old World. Their rule although it may be undisputed by any foreign power, is despised by those who have any manly feeling, as suitable only to "a beardless race."

The lynx is one of the smaller *Carnivora*, and is afraid of man; hares, sheep and young deer are its prey. It does much mischief where it abounds. It is hunted for the sake of its skin, which is valuable in commerce. Its eyes are even more oblique than those of the tiger. Its fur is long and thick, and its ears have a tuft of fur at the top, which makes them appear very long.

The lynx is a type of a shrewd, quick-sighted, "long-eared" class of men, who prey on a community that wishes to get rid of them. They do not openly attack the independent, but get their living by cunning and address; by spying at back-doors, and listening at key-holes. Though poor and shabby in appearance, they yet not unfrequently, leave considerable wealth behind them.

Two species or varieties of the cat are known in the British isles. The wild cat (*Felis catus*) and the domestic cat (*F. maniculata*). The wild cat is as fierce and strong as the tiger, in proportion to its size. Rabbits, young lambs and game are its prey. When excited, it attacks animals much larger than itself with great fury; but is usually watchful, crafty, and generally careful to attack only the weakest animals. Yet when driven up into a corner, it will defend itself desperately.

It has its analogue in some individuals of the Celtic race, who are usually unwilling to work steadily. Such have not the useful qualities of the Lowland peasant, or the English labourer, any more than this tiger in miniature, has of the Scotch colly or English mastiff.

Women sometimes resemble the cat in disposition; the individual we are about to describe, possesses in a greater degree than any one we have met, the qualities of puss.

Her head is wide over the ears, and her eyes are very oblique but of a light colour, which looks somewhat strange with her black hair. She is well formed, slim, muscular and rather graceful. She works pretty briskly, and keeps her house in excellent order. Her person and dress are clean, and she sits much at the fireside. When it is wet she hates going out, unless she can go in a carriage, that her feet may not touch the ground. She is much admired by her female friends who are but slight acquaintances.

She is furious when provoked, and in her younger days was apt to leave the mark of her nails behind her; but this unpleasant habit has been long cured. She is very crafty in her mode of accomplishing ends, but it is said was very "loud" in her courtship. She takes great pleasure in teazing those who are in her power, whose position may be compared with the mouse in the cat's paw. She usually "keeps within the statute" in her misdeeds.

The cat becomes very much attached to places, and to different circumstances or modes of life. These appear to exercise a great influence over it. The cat is unwilling to sacrifice comfort, do much for, or follow those even who are most kind to it; but appears to miss their attentions if withheld. It is incapable of forming a cordial regard, like a dog, even of a surly race. At the same time the cat has a feeling of sympathy, certainly not of an unselfish kind, but still better than no sign of feeling.

We remember a family whose dispositions were of an unamiable character; envious and treacherous; kind only in name; liberal only in presence of the clergyman and newspaper reporter. They subscribed to charities, only when much pressed

by the influential, in order to make money go as far as possible, for the purchase of credit and a good name. To those who were even moderately good judges of character, their manner was repulsive ; their shake of the hand, was cold and clammy, like a reptile's touch. They were not altogether unsusceptible of kindness but *love of persons* with them, was like the cat's, mainly founded on love of Place.

The ichneumon although of small size is the most savage creature known, and excites our wonder by its cunning and ferocity. It is more destructive to animal life than many beasts of prey of much larger size, and is not to be despised as an enemy even among the larger animals. The ichneumon (*Viveria ichneumon*), is said to watch the crocodile of the Nile, and when it opens its mouth jumps down its throat and gnaws a passage for itself through the stomach and intestines—a memorable instance (if true) of extraordinary courage and address, overcoming a much greater force. It devours the eggs of the crocodile, which lie buried in the sand, and thus checks the increase of what might be too numerous as a species.

The ichneumon has an analogy to some little boys, possessing enormous courage and cunning, directed to the destruction of property and animal life. When they enter a house, their chief aim seems to be to pull it to pieces. They show great violence, and if not checked the house is soon "Gutted," by these little ichneumons in human shape, and every living animal teazed or destroyed. As an example of what human nature is when left to itself, they are instructive. They should be kept in check by those who are stronger than themselves, and their great energy like that of the ichneumon should be directed to the destruction of the more noxious insects.

The weasel (*Mustela vulgaris*) one of the smallest and fiercest of the Carnivora, does not hesitate to attack the rabbit, ten times its weight. It is long-bodied, short-legged, and lizard-like in motion and has a sac from which it discharges when enraged, a most fetid liquid ; polluting what it comes in contact with. It is more useful than hurtful to man ; for it kills by a bite through the brain innumerable mice, and rats ; but this is partly counterbalanced, by the mischief it occasionally commits in pigeon houses and rabbit hutches.

Some persons resemble the weasel in certain qualities ; being active and agile on a small scale. They are malicious and spiteful, and take pleasure in doing personal injury, and are frequently offensive from their capacity for foul abuse, which is however sometimes bestowed on those who from their unpleasant qualities have made themselves generally odious.

It would not be well in the present state of society, for

this class of men to become extinct, notwithstanding their disagreeable properties: they become less numerous as society advances.

The stoat or ermine (*M. erminea*), a graceful little creature, changes its complexion according to season. In summer it is brown-backed, and light-coloured beneath. In winter it is a delicate yellowish-white all over. In summer it runs among the herbage and rocks, and its brown colour renders it less conspicuous. In winter its nearly white appearance makes it little observed on the snow. It can thus approach within a short distance of its prey, without alarming it too soon, or giving it time to escape.

It is a curious fact, that in Britain the stoat only becomes an "ermine" in cold seasons. In mild seasons it is often seen variegated.

Circumstances often alter the external characteristics of men, who may be said "to take their colour" from what surrounds them.

If a man can live through adversity without loss of character it is happy for him; but under trial he frequently supposes that he must assume a different guise, to be changed again in a period of prosperity.

The stoat's form is stouter in winter; but still it is always the same animal,—the tail is always tipped with black.

The most accomplished actor cannot entirely transform himself, he has always personal peculiarities left.

The polecat (*M. putorius*) is a very fierce little animal not to be daunted, or turned back from attacking creatures of a considerable size. It is very destructive to poultry and game, and slaughters without mercy, far more than it can devour. The ferret which is probably an albino variety of the polecat, is trained to enter muzzled the holes of rabbits, and drive them out into nets, spread at the mouths of the holes. Were it not muzzled it would get drunk on the blood of the rabbits, and remain in the hole.

Like the subtile detective of doubtful reputation, it appears to take extraordinary pleasure in driving creatures into the snare.

Detectives and ferrets require to be treated with caution. It should always be borne in mind what they are. The difference between some detectives, and some malefactors, is principally that the first are working for the benefit of the public, and the second on their own account. Men, who are the most familiar with the criminal classes, are those best able to hunt them out and drive them into the meshes of the law, having a low moral organization themselves. Yet they cannot be trusted with-

out a close surveillance. For the "reward of blood" they are willing to enter the "lowest holes," and drive into traps those who prey on the fruits of industry. That they are exceedingly useful cannot be denied; but we despise them. Like ferrets they are never allowed to drink when on duty; but when their prey is captured they often exceed.

Evil instruments are made for evil work; those who are "clean" are not fit for what is impure; and evil agencies are employed in punishing those, whom good ones cannot so well reach. The pure do not always understand evil, so well as to be able to deal with it.

The polecat is a ferret in a wild state, and is hunted down and destroyed unmercifully, merely because it directs its powers of destruction against valuable property. Were it to destroy the rats and mice only, it would take rank with the domestic cat.

The skunk (*Mephitis americana*) is a little animal chiefly remarkable for the fearful odour it exhales, which is more unpleasant than that of the badger, weasel or polecat. Yet it is eaten by some Indian tribes. This circumstance reminds us of those who though "dying in an odour of sanctity" among certain persons; yet by others, were considered during life, as being in the depths of depravity. The religious rites of some savages though viewed as acts of piety amongst themselves, excite horror in the civilized man.

The glutton or wolverine (*Gulo luscus*), is a great enemy of the beaver. It likewise attacks larger animals, which are disabled from defending themselves by disease or accident. It is peculiar to the Polar regions of Asia and America, and is notorious for the cunning with which it destroys the traps of the hunter. Its fur is prized in civilized countries, but still more in the desolate regions of Kamschatka, where the women dress their hair with its paws. This is appropriate to a savage and brutal race, gluttonous of animal food, cunning, and not to be easily entrapped.

The glutton, unlike many other animals gets blacker as the cold advances. It is also in part true, that the colder the climate, the darker the human inhabitants, throughout the Arctic regions of Asia and America.

The otter (*Lutra vulgaris*) is called the "aquatic polecat," and it is certainly allied to the weasel family. It is ravenous for fish, and is exceedingly destructive in our preserves; catching and destroying, far more than it can devour. Its lair is often found strewed with spoils, and is visited by hooded crows, and sea gulls, who banquet there on what it leaves. The otter can be trained to catch and bring fish to its master's feet.

The otter displays a strong analogy with those fishers, who long pirated in the Northern Ocean, and on whose leavings so many smaller tribes came to feast, but who now work for the general good. Such were the Scandinavians; once the terror of the "Four Seas;" and late the Glory of the West.

The morning Eastern sun has shed its brightness; its lucid ray was purest; the noonday sun was hottest, falling most equally on all. But now the Day is passing; all the light comes from the West:—it is a gorgeous light. Rich and varied tints shroud the close of day. The reflection of these colours fills a great arch. Are they too bright to last? and will a gloom pervade the Western horizon? The sun will rise again and overshadow the East, with purer and whiter rays than it ever shed before. This will be followed by an unclouded day!

Christianity is the only form of religion which can stand in an enlightened East. Is it not through the prism? a trinity, that we gain our knowledge of the Elements of light? or of those colours which compose the light of the sun?

Even now when "we look through a glass darkly," we see the primary colours,—Blue, Yellow and Red; which typify the three accompaniments of an Everlasting kingdom, CONSTANCY, GLORY and POWER.

The gold and blue in union yield refreshing green, which suits repose, that cannot fade, that ever flourishes. The blue and red unite, to form the purple Ruling Power. The red and yellow compose orange; which illustrates knowledge, THE FOUNDATION OF POWER AND GLORY.

CHAPTER XI.

THE RESEMBLANCE BETWEEN MAN AND ANIMALS.—*Continued.*

BEARS—SEALS—WALRUS—SQUIRREL—DORMOUSE—FLYING-SQUIRREL—MARMOT—AGOUTI—PORCUPINE—CHINCHILLA—BEAVER—JERBOA—LEMMING—RATS—MICE—WATER-RAT—SHREW—MUSK-RAT—HEDGEHOG—MOLE—HARE—RABBIT—RACOON—COATIS—CIVET—CATTLE—BISON—MUSK-OX—GOLDEN-CALF—SHEEP—GOAT—CAMEL—LAMA—HORSE—HIS TEMPERAMENTS—THOSE OF PLANTS AND FRUITS—BREEDS OF HORSES—THE HISTORY OF THE HORSE—ASS—MULE—TAPIR—CONEY.

THE polar bear (*Ursus maritimus*), the largest and most powerful of its tribe, preys on fish, seals or the carcases of whales, or of any animals that fall within its reach, but it sometimes ventures to attack the huge and unwieldy walrus.

The Russian power is popularly illustrated by a bear, whose character truly exemplifies that of the great empire. Various species of bears may represent Russian influence in different localities. As the polar bear tyrannizes over the seals; so does the Russian government over the feebler Hyperborean nations; which it sometimes endeavours to drive from their fishing grounds in the Arctic seas.

The brown bear (*Ursus arctus*) is a type of the diplomatic representative of Russia in most parts of Europe, who notwithstanding his artificial polish in public; in private life is still "a bear." The Russians and the brown bears, are particularly abundant in Poland where they excite much terror. The Russians and their animal representatives, are much less feared than they used to be on the continent of Europe; but in England they are known only as rare visitors.

The bear is a very intelligent creature, but its intelligence is not so great as its strength; such is the character of Russian influence, which is awkward, powerful and massive, rude and clumsy; yet most crafty.

The black bear of America (*Ursus americanus*), typifies Russian influence in that country, which extends even to the more Southern of the United States.

The Russians in Russian America, being not so much influenced by the civilization of Europe, as those in less remote

regions, may be compared with the grizzly bear (*Ursus ferox*) of the northern portion of the rocky mountains.

Surprise has often been expressed that the Yankees, notwithstanding their boasted liberal institutions, have for many years courted the friendship of Russia, a power pre-eminently representing brute force. This is not so inconsistent as has been often supposed; for Democracies are pre-eminent for their rude tyranny. Russia has of late thrown herself into the arms of the "grizzly bear," by selling her American possessions to the Yankees.

As we advance towards the South, the very species of bear even is not changed; the same savage, grizzly animal, being alike found in Russian America and the United States; and also in British territory.

Men showing a resemblance to bears, are found in many countries. They are stout in the body, wide in the head, and immensely powerful in limbs; yet are awkward in their way of sitting down. They possess a small fierce eye, and should not be trifled with. Their uncouth manners are accompanied by the use of coarse language, but voluble abuse is not characteristic of them; for they are more inclined to display their anger by blows than words. In general they show little kindly feeling or generosity, and are courageous, but are also greedy, gluttonous and cruel. Fondness for their children is usually the only amiable trait they display. Their ears are commonly very large and stick out. Their hair is very thick, pretty long and very dark, but not curly. They are cunning and not easily conquered; for they can make a desperate resistance.

We once saw a French subject, of mingled Polish and Turkish descent, who had just this physiognomy and character. He was usually considered most unamiable; but ventured his life to save his children, upset from a boat, on the ice on one of the Swiss lakes. He succeeded in extricating them from their perilous position, but one died, in consequence of a fever brought on by the wetting. He mourned for a considerable time, evidently feeling the loss acutely; but it had not a subduing influence on his morose and savage spirit. Like "a bear robbed of her whelps," he went round the village, vowing vengeance against the man who had upset the boat;—a case of pure accident, caused by one of the sudden squalls, which are so frequent on Alpine lakes.

The seals are an important and interesting genus, of great value in commerce, feeding entirely on fish. Being mild in disposition, yet sufficiently strong to defend themselves against those enemies they usually encounter in their native seas, their

lives, but for man, would be particularly smooth. They are amphibious, but are more at home on the water than on land.

They are pursued on account of their skins and for the abundance of their fat, and are unceremoniously knocked on the head and stripped. When tamed they become attached to their masters, and are amusing creatures. When they first encountered the civilized man, they showed no fear, but now they must be hunted by torch-light and with fire-arms, and it is to be feared that in a few years they will be nearly extirpated.

The inhabitants of many of the islands of Polynesia, spend much of their time in the water, like seals, and come ashore at night. Like those animals they are stout in the body, and live principally on fish. The natives of many of the islands of the vast Pacific, showed no fear when they first had intercourse with Europeans. But their courageous simplicity was in some cases sadly betrayed. They, like the poor seals were severely beaten, and perhaps stripped of their property. They gradually became more shy of those who treated them so badly; but still showed great difficulty in believing ill-will. Good natured and happy, they enjoy the present moment; the past is little cared for, and the future still less.

In some cases we fear they may be extirpated. Our friends the sealers, will then be no more welcomed by their swarthy faces; or by their presents of yams and sweet potatoes, to be exchanged for nails and buttons. Folly and cruelty capable of occasioning this, may be compared with that of the man in the fable, who "killed the goose that laid the golden eggs."

The South Sea seals, have their prototypes in the populations of the island groups, who differ as much in character, as the various species of seals. There are sea-lions and sea-leopards, as well as sea-goats and sea-calves. The sea-lions fight desperately among themselves, and are a terror to all smaller animals.

These have their analogues in the Maories of New Zealand, who feared not the whalers, but devoured many a European, shipwrecked on their coast.

The sea-lions with their great teeth, have mangled many a human skull. Such are formidable indeed; all the little seals flee as they draw near.

The Maories, "the Lions" of the South Sea, are like the "British Lion" in individual power. It may extirpate them, but only with the loss of much of its own blood; for a conflict with them is serious. They have a similar relation to other Polynesian tribes, as the sea-lions have with the smaller seals. They conquered the Polynesians they came in contact with, but never CONQUERED THEMSELVES.

A more powerful nation at last landed on their shores. The lion of the north has greater grasping powers than the sea-lion; and in like manner the British race retains its possessions more tenaciously than the Maori. "The Lion" has *sharp claws* for its enemies, but *a cushioned paw* for its friends. The Maories must choose which paw they will have.

The common seal (*Phoca vitulina*) is mild compared with the sea-lion or the sea-leopard, but yet preys on the northern fish. It is good-natured, and can be tamed even to catch fish for those who keep it. It manifests more intelligence than we should expect from a seal. Its skin is thick, it is stout in the trunk and yields much oil. It is gregarious but inoffensive to man.

The Greenlanders who also inhabit an Arctic country, resemble this seal in their love of fish and mild disposition. They are not usually considered to have much intelligence, but they show qualities eminently suited to the climate and surroundings of the region in which they reside.

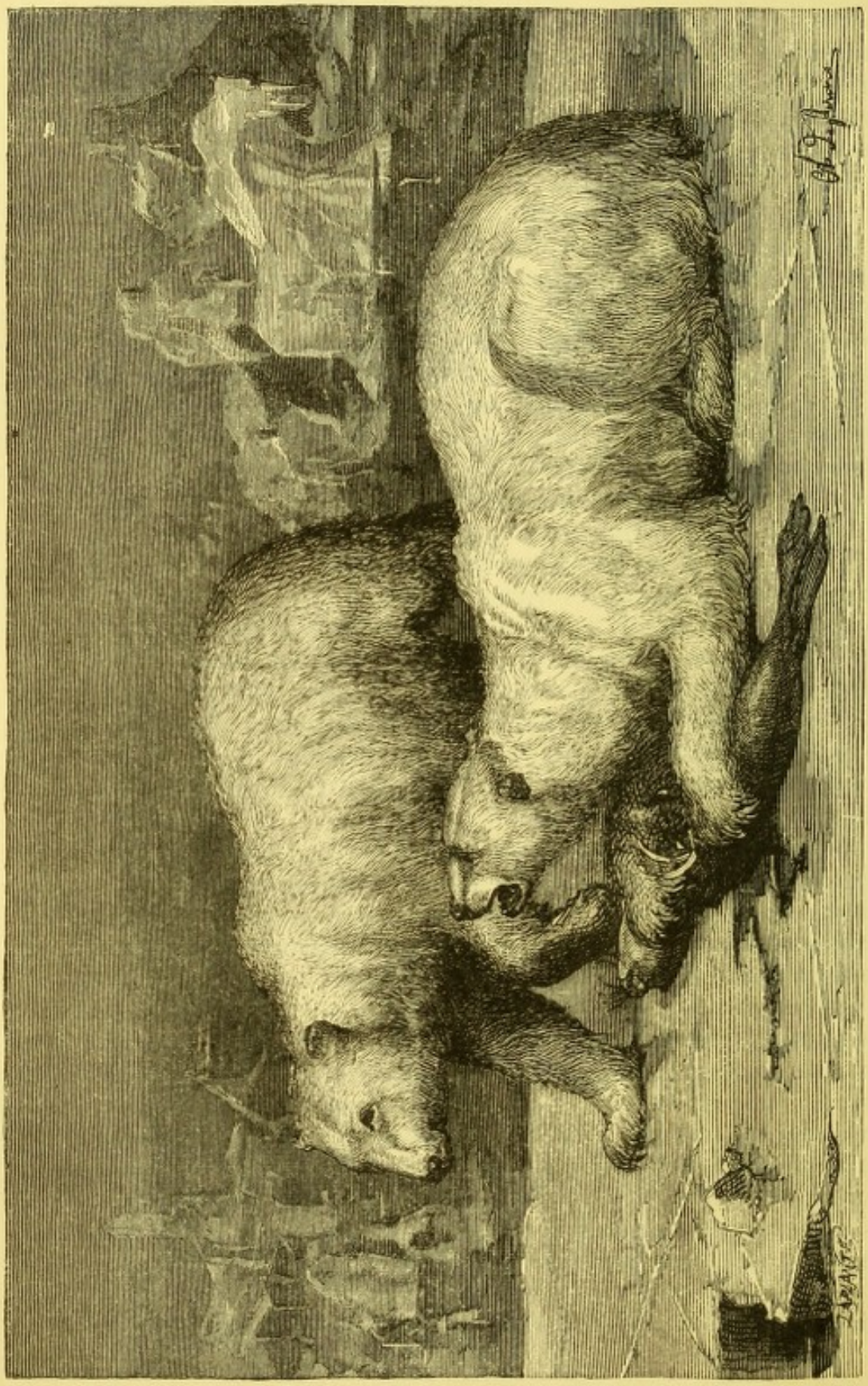
The seals in general, typify the maritime divisions of the Mongolic race. The Maories are thought by some Ethnologists, to exhibit traces of "Caucasian" (Semitic-European) descent, and their characters are thus illustrated by those of the sea-lions, who show affinity with animals of a higher order.

The walrus (*Trichechus rosmarus*) is allied to the seals, but is so much larger and grander a creature, that we are inclined to give it a higher place. Its food consists of fish and marine plants.

We think that the walrus typifies the Scandinavian race settled in the Arctic regions, which is so vastly superior to the Laps or Esquimaux, both in physical stature and moral and intellectual capacity. They adopt a less exclusively fish diet, being fond of a due proportion of vegetables.

The squirrel (*Sciurus vulgaris*) like several other species of its genus is lively, playful and exceedingly graceful. It feeds on nuts, bark of trees, grain and occasionally beetles and bird's eggs. It is not therefore so innocent as is often supposed, but so very interesting in habits, that we are inclined to excuse the depredations of the lovely little creature which so much enlivens our woodland glades by its agile sports. It can bite severely when liberties are taken with it, but not in the same ferocious manner as a carnivorous animal. It is covered with soft fur of a rich foxy brown, and has a long bushy tail which waves behind; the teeth are yellow; but the eyes are bright and pretty.

The squirrel has its analogue in a sportive, thoughtless girl, active and sprightly, graceful but graceless;—the delight of a pic-nic party. She has like the squirrel, red-brown hair and



WHITE BEARS DEVOURING A SEAL.

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yellow teeth; and like it is fond of nuts and *bonbons*. In our sportive moods we like the society of this pretty maiden, but she has so little in her character that we can respect, that in our serious moments we treat her coldly. It is not always safe to trifle with her, for she utters biting speeches when they are least expected.

The nest that the squirrel builds for its young, is called its "drey," which is particularly comfortable and usually far out of the reach of snakes, cats and other enemies. In the autumn it hoards many nuts and other articles of food, and thus a wise provision is made for the future.

Many a sportive girl, in her married life shows a comfortable house well stored with luxuries, and far out of the reach of her less fortunate companions; whose passions fed on envy, would gladly bring her down from her Elevation; but she wisely distrusting their Machinations, has placed herself out of the reach of their venom. With all her sportiveness, she has a strong "instinct of self-preservation."

The dormouse (*Myoxus avellanarius*) is a very small creature, comparatively innocent, yet in its choice of food sometimes less careful than the squirrel. It eats much grain, for which it is disliked by the farmer in districts where it is abundant. It seldom like the squirrel ascends lofty trees, but loves to dwell among the low herbage, or on the grassy bank. It builds a nest of fine woven grass, like that of one of the warblers amongst birds; and the entrance is sometimes so small and neatly finished, that the little creature as it goes in, pushes away the elastic grass, which closes round, and the hole is hardly perceived; thus it is warm and snug. It lays up a store of seeds and fruits at the end of autumn, and becoming very stout, retires to its nest and sleeps during the cold weather. But when the south wind blows wakes and eats; then sleeps again, until as the leaves open it springs from its nest,—as the peasant does in Russia and some Northern countries, when the seed-time comes. He lives in the cold weather on what he saves in summer and autumn, for in the winter most outdoor work is suspended:—he then retires to his snug cottage.

The flying squirrel of America (*Sciuropterus volucella*) is a link in nature connecting two orders of quadrupeds, the bats and the rodents. It is wonderfully quick and agile in its movements, and is enabled to set the ordinary laws of locomotion in quadrupeds at defiance. Its gambols are much more violent than those of our common squirrel, between which and a certain class of English young ladies we drew an analogy. We now carry the comparison across the Atlantic.

The flying squirrel which is more erratic than the common

species, we consider illustrates the Yankee girls, who exceed in their "fast flights," the girls of British birth. The English girl can kill time by jumps; the Yankee girl by flights. Those who would run after either, must remember the diverse habits of the game.

The flying squirrels are quite as attractive as the British species, but are not so easily tamed. They are more short-lived,—in captivity at least.

The marmot (*Arctomys marmota*) does not lay up stores of food like squirrels and dormice, but its fat is its sole support as it lies in its burrow, when the winter frosts make the earth chilly. It is a sullen, obstinate animal common in the more elevated districts of Savoy and the Pyrenees.

The human inhabitants of those districts are diminutive, and have a good deal of the dogged simplicity of the marmot. They retire to their villages, hid in the deep trenches between the mountains, during the coldest of the weather, while the valleys are blocked up with snow.

In foreign countries the marmot is often the companion of the wandering Savoyard, who begs his bread; and as an excuse exhibits one of these animals:—it is thus a national emblem.

The agouti (*Dasyprocta agouti*) allied to the guinea-pig, is a mild, gentle creature, with little energy or power. Although prolific, it does not reach the amazing fecundity of the guinea-pig. It has been nearly extirpated in some localities.

The agoutis resemble some of the native tribes of the countries they inhabit, such as the aborigines of St. Domingo, whom the Spaniards destroyed. We lament the extinction of any race of Man, and regret the extirpation of any species of animals; yet we must allow that some of the sensuous Indian tribes of the tropical Western world, occupied a place amongst mankind, no higher than the agouti does among the Rodents.

The crested porcupine (*Histrix cristata*) has not the grace and beauty of some animals, yet is so curious in structure, and interesting in habits, that we are inclined to give it a prominent place in our typical review of quadrupeds.

It is indisposed to attack large animals, but can make a formidable defence, even against the more powerful beasts of prey. It is comparatively defenceless in front, but is well armed behind, and in this quarter is a match for its enemies.

It is not formidable in teeth and claws, but mainly relies on its quills, which it erects, and placing its head and feet beneath them, awaits the approach of the foe. Even the lion and tiger generally shrink from attacking it, if on its guard. It is equally wary with those animals that are not carnivorous; but seldom attacks any without provocation; unless for food.

Some human beings resemble the porcupine in character. They are not aggressive or inclined to mischief; but when driven into a corner, they lower their heads and begin to ply their quill pens, which are exceedingly wounding, and sometimes even produce incurable sores. All men feel their wounds, except those who are as little sensitive to sarcasm, as the rhinoceros and alligator would be to the attacks of the porcupine.

We value the quills of the porcupine for ornamental purposes, as they display well in *black* and *white*. Writers of the character to which we have just referred, are frequently the ornaments of an age, for they have the power of depicting in varied colours, which enlivens and illustrates their works.

The chinchilla (*C. lanigera*) whose pretty fur we so much admire, is a harmless, gentle, little beast, and resembles the squirrel or the dormouse in shape. It inhabits the Alpine valleys of Chili, and its fur is a valuable article of commerce. Docile creatures are the most generally useful to man, and these chinchillas, although not domestic animals, from their simplicity and innocence are generally favourites.

The weaker amongst men are always the prey of the stronger, especially when they have valuable property. It is not always necessary to convict them of being injurious to society, in a South American Republic like Chili. If they possess what others want, and cannot defend their rights, they are very apt to be made martyrs thereto;—like the chinchilla.

The beaver (*Castor fiber*) is one of the largest of rodents, and is in many respects one of the most remarkable of quadrupeds. If we can credit what is said of their habits by naturalists, they should be placed at the head of their order. The extraordinary dams they construct, their curious circular habitations, some of which are divided into compartments, the manner in which they fell trees; and their great perseverance in all their undertakings, astonish us. They adapt the character of their dwellings to their locality; for sometimes they are not at the pains to construct the elaborate dwellings above described, but content themselves with a burrow on the banks of a stream, like that of a water rat.

Their affection for each other is said to be remarkable; and the manner in which they combine, to construct a dam to keep water round the aquatic lilies (*Nuphar luteum*), and other plants on which they feed, reminds us of the united labour of human beings for mutual benefit.

The beaver is a shy and gentle animal, fleeing from the haunts of men. It was once a native of these Isles, and other countries of Europe, and was not extirpated in Great Britain until after the 12th century. Like the human abo-

riginal inhabitants of many countries, it has been subdued and driven away by those larger, fiercer and stronger than itself. The beaver always had a great enemy in the wolverene or glutton (*Gulo luscus*), which however could not extirpate it. Civilized man is the Powerful enemy, before whom the beaver must perish or retire.

Where are now the tribes that executed the simple works and manufactures, of which we have in many countries a few relics? They have passed away, having but little place in a civilized land,—like the beaver and its dams and mud-huts; yet still their interesting ways, make the more sentimental among us regret them.

Such were the human populations, who are believed to have dwelt on the Swiss lakes, at a period anterior to that of the Celts. They were probably a mechanical race, whose monuments dimly shadow out their being, through the gloom of the past.

The jerboa (*Dipus ægypticus*) lives in its burrows all day and comes abroad when the cold dews fall: it can jump enormous distances. The flesh is unpalatable to Europeans, but is eaten by the Arabs.

The jerboas typify the Copts, who with them inhabit Egypt. The Copts "can make good use of their legs when pursued," and were long the prey of Arab conquerors.

The lemming (*Mus lemmus*) is omnivorous, eating the scanty produce which the short summer yields to the inhabitants of the North of Europe. It is thus one of its "scourges," and takes the same place as a destroyer, as do the locusts of the South. When the lemmings have exhausted the vegetable produce in their neighbourhood, they eat each other.

The lemmings which desolate Norway and Sweden, have their home in the more northern country of Lapland. They may be compared with those Northern nations, so much dreaded by the inhabitants of the South, who likened them to swarms of rats and other omnivorous animals. For after having desolated and consumed the choicest productions of a country, they turned their rage against each other.

The black rat (*Mus rattus*) formerly did much mischief, and was, compared with the mice a powerful animal. Like the Celtic nations, it is said to have come from the East; and long it flourished in its Western home. At last a lighter-coloured rat of greater weight and size came, called the "Norway" or brown rat (*Mus decumanus*, Pallas), and visited France, England and Germany; it subdued or drove away the black rat.

The Normans conquered or displaced, the previous populations of many parts of Europe, as in the North of France,

Sicily and England. They have lighter hair than the Celts generally; being a brown,—rather than a black-haired people.

The short-tailed field-mouse (*Lemmus arvalis*) is our most destructive mouse, as it increases rapidly and destroys much corn, the bark of trees, and other of our crops. The trees that are barked by this creature are soon destroyed.

We cannot entirely extirpate these mice; in common with some of those classes in human society which prey upon our industry; but we can lessen their numbers by the use of dogs, cats and traps; which have their equivalents in Military, Police and Gaols.

The domestic mouse (*Mus musculus*) is as annoying to the housekeeper, as the field-mouse is to the agriculturist. It tunnels our walls, gnaws our furniture, and everywhere messes and defiles our property, leaving a rank smell. In this it resembles some of the young of our species, who are fond of boring holes in furniture and walls, and who soil and stain what they touch.

The water-rat (*Arvicola aquatica*, Flem.) like the dormouse and squirrel, stores up provisions for the winter, sometimes collecting a gallon of potatoes or roots in its deep burrow. It does much mischief where it abounds in our fields and gardens, being strictly frugivorous.

It may be compared with garden thieves amongst a village population, who like the water-rat, often root up, destroy and hide, more than they can dispose of.

The shrew (*Sorex*) lives entirely upon insects, which it destroys in great numbers. As it is very numerous in many districts, it thus does much good in removing noxious species. Amongst the ignorant and superstitious, it gets the credit of doing harm to cattle, and was the subject of invective and incantation in times past. It has a peculiar pungent odour, disagreeable to many persons, which proceeds from a gland near the tail, containing a substance more or less poisonous. It is exceedingly pugnacious, and when two shrews meet, a battle is likely to ensue.

These animals have their acknowledged analogues in a particular class of housewives, who are sharp and orderly, and as they kill all the beetles and flies they meet with are of much service in a house; but we do not like to come near them. Like the shrew-mouse they have sharp noses, and are fond of poking into dirty corners. When two women-"shrews" meet, they sometimes show their spiteful characters in mutual attacks. They should not however be persecuted as a class, for their sharp noses, can scent out what others cannot, and their houses are not unpleasant to enter when the "shrew" is not at home.

The-musk rat of Russia is a curious creature, which shows an analogy to the shrews and the duck-bill platypus. It possesses a gland containing a substance which has an odour inferior to but somewhat resembling musk. Its skin is useful to put amongst furs and other clothes, as the odour it exhales is avoided by insects. This pungent smell frequently assists its escape from attacks or injury, for many creatures avoid it, and those who kill it, often refuse to eat it.

These animals resemble those amongst human beings, whose disagreeable and disgusting qualities preserve them from being "the prey of the stronger." When our premises are scaled by unclean beggars, we order them away, but we do not like to "lay hands on them" ourselves.

The hedgehog (*Erinaceus europæus*) has been unjustly maligned, having been accused of much that it cannot do. It is in reality a valuable animal from an economic point of view, for it destroys multitudes of insects, vipers and other reptiles; cockroaches and beetles. It is slow in motion, and were it not so thickly covered with spines, would be a victim to every large nocturnal beast of prey.

When it fears danger, it withdraws its head and feet beneath its spiny covering, which it closes round it like a mantle. In this state many a fierce dog hesitates to attack it, and it can be rolled or kicked about with little injury. If it has little power of making an attack, it can like the porcupine make an effectual defence:—Men of this character exist in society.

The hedgehog, so useful in ridding us of vermin, finds its analogy in the smaller fry of "the press," so useful in strangling our local abuses; but who are easily attacked themselves; unless like the hedgehog they keep within what is specially afforded for their protection. "THE LIBEL LAW IS THE SHIELD OF THE PRESS." Keep within it and you may wound with impunity.

The mole (*Talpa europæa*) is one of the most industrious of little quadrupeds, and its structure is perfectly adapted to its habits. It has a close, dense fur, that scarcely anything will soil, or any dirt penetrate; eyes that are suceptible of light, but incapable of sight. It has no external ears, but yet its hearing is wonderfully acute. Its nose is very long and flexible, on which it depends more than on any other organ for its knowledge of objects. Its fore feet have a superficial resemblance to the human hand, and have enormous scooping powers. The mole can progress through the earth at an amazingly fast rate; faster than it can on a flat surface.

In pursuit of its prey it forms galleries, which wind beneath the soil to a great length, but they also answer as its place of

residence. Its enemies find great difficulty in following it, through those narrow and tortuous passages, which it blocks up at the entrance by a heap of finely-divided soil. Its foes are numerous and belong to various classes, the most formidable is man: but dogs, cats, weasels, hawks and owls likewise lessen its numbers.

The value of the mole to the farmer, is variously estimated by different naturalists, and doubtless greatly depends on the character of the locality it inhabits. Its food consists of earth-worms and insects, never of agricultural produce. In Alpine pastures we should think it is very beneficial, by ventilating the soil, bringing fresh earth to the surface, and destroying multitudes of grubs. But it is sound economy to lessen their numbers in highly cultivated districts, where their incessant burrowing and heaving up of the fine soil, disorders our plantations and choice meadow land. We are no advocates for the extirpation of moles. We consider them types of those artisans, whose labours are only suited to an uncivilized state of society, and are hurtful to one of high culture.

The lowest sections of the agricultural populations, like the mole, grovel in the soil, and are the companions of earth worms in life as in death. Such are being displaced like the mole, by "the march of agricultural science."

Moles possess qualities which are shown in few animals to so great an extent, and not many follow their prey with equal perseverance and success. The sense of sight is imperfectly developed, but the extreme acuteness of their other senses, more than compensates for its deficiency in a creature that passes so much of its time in the gloom. Human beings of the character to which we have above referred, perform those offices which immediately concern their daily routine of duties with great success; but like the mole they are "blind" to what is in the least degree beyond "their humble sphere."

The common hare (*Lepus timidus*) is a mild, gentle creature, easily frightened as its Latin name implies. It subsists entirely on plants. It is so swift of foot, and so quick of hearing, that were it not for its feeble intelligence, it would in most cases defy persuit. After being followed by the hunters and dogs, it generally returns to the spot from which it originally started;—a habit which Goldsmith beautifully uses to illustrate the wish the wanderer has "to die at home."

Hares are excessively destructive to farmers' crops, and were they not extremely valuable for sport and food, would long since have been extirpated.

There are mild and gentle persons among us who resemble hares. They have commonly "long ears," and although "not

asses," yet are ready to listen to almost any speaker. They have ill-balanced minds, and take alarm at the veriest trifle. Their mildness should however lead us to treat them with more consideration, than some of the acute and courageous are inclined to do. Such weak persons are apt to be the prey of "sporting characters," who would not wish to extirpate them, but who like to worry them. "Great Villiers," was said to

THE HARVEST MOUSE (MUS MESSORIUS, SHAW) AND ITS NEST. Page 293.

value most of all "a fool to laugh at," and he was one of the greatest "sportsmen" of his day.

No greater evil could befal a country, than to be overrun by "harebrained" men; although we pity them, yet we feel they ought to be KEPT DOWN. They have not spirit or energy to leave the spot where they are persecuted, but return like the chased hare. This is particularly the case when they attempt argument; it may be long, but generally ends in a *safe* arrival

at the *starting-point;* and when *hard-pressed*, they know how to "shift their ground."

The rabbit (*Lepus cuniculus*) is a more prolific and abundant animal than the hare, and is suitably protected in a burrow, which the more fully developed and active hare does not require. —The rabbit is blind and helpless at birth, but the hare can run almost as soon as it is born. It is not so timid as the hare, being apparently conscious that it has a place of safety at hand, to retire to at the last moment. It is more frolicsome and lively, and more inclined to be familiar with us, we therefore

A HEDGEHOG AND FAMILY. Page 294.

like it better, and can more easily reduce it to a domestic state than the hare. When it is wild we hunt it; when it is tame we pet it. The rabbit has little intelligence, but increases with amazing rapidity.

Persons who being very fertile stay much indoors, have offspring who are prone to be feeble, and resemble rabbits in character, rather than elephants or lions.

The changing hare (*Lepus variabilis*) is much more easily tamed, and is more frolicsome and pleasing in its manners, than the common hare. As the seasons vary, so does the

colour of this species. In Britain it is only found in the more northern parts.

The common hare being found in the lowland districts of England, may typify the timid amongst the English: and the changing hare which alters its coat according to season, may illustrate a similar class among the Scotch, who though they escape some dangers, yet may earn from their double character, the nickname of "turncoat."

The racoon (*Procyon lotor*) reminds us of the fox, the cat, and the badger, and partakes of many of the points of character of each. It is cunning, treacherous and ill-tempered, but kind treatment has a greater influence upon it than upon the fox. The racoon is rather wanting in courage in attacking animals of its own size, and is easily cowed. It can never be perfectly tamed, but the first opportunity always returns to its wild habits. It is given to robbing hen-roosts, and is exceedingly destructive to the smaller domestic animals of the farm.

The character of the racoon is sometimes exemplified in human society. The following anecdote of a gipsy boy, well illustrates this animal's disposition.

The lad was caught one night by a lady's servant in the fowl-house, in the act of killing a fine Cochin China hen. The lady handed him over to the police, and after some weeks' imprisonment he was sent to a Reformatory, and having for the last six months of his residence there behaved well, the lady was induced to take him into her establishment as stable-boy. For three months he did his duties, but on some of his tribe coming into the neighbourhood, he made off to them stealing a pig. This being a valuable animal, a reward of £5 was offered for its recovery, and one of the tribe gave evidence against the boy, who had five years' penal servitude.

Many gipsies have been taken much trouble with, and petted like this boy by foolish people; but they mostly display so low a moral organization, that there is little hope for their being useful members of society, unless under a high degree of restraint. Whenever the pressure is removed, they show their native wildness.

The coatis (*Nasua fusca*) is a fierce, active brute related at once to weasel, lemur and bear. It is one of those untameable creatures which no kindness or harshness can subdue. It will eat, or at least bite anything it comes near, and with its intensely sharp teeth, it can inflict most painful wounds. Its voice is a shrill squeak, when once heard not easily forgotten. It is a native of Paraguay.

The human inhabitants of this region, are low in credit and in morals. The population, consisting principally of Indians

with a small portion of white, and a considerable share of Negro blood, is much mixed, and the compound races Mestizoes, Mulattoes, Zamboes and Chinos, are suitably typified by an animal like the Coatis, possessing the qualities and appearance of such widely diverse genera.

Their government combines the ferocity and rudeness of the "Russian bear," with the religious bigotry of the Spaniard; which grasps as tightly the throat of the expiring utterer of truth, as does the relentless weasel that of the rabbit. The small, squeaky voice of the coatis, is representative of a most insignificant power, with a miserable tyrant for a President.

The civet (*Viverra civetta*) secretes a substance considered a delicious perfume by some persons, but reviled as an awful stench by others. When greatly diluted, and mixed with a variety of ingredients it is agreeable, but is not generally liked unless so modified. Pope says of ambergris

"In heaps a stink it lies,
But well diffused, is incense to the skies."

And what is true of ambergris according to him, is true of riches. Wealth in itself, unless judiciously distributed, may be as loathsome as concentrated civet. Those who are gifted with it, may like this animal be a means of benefiting an extended circle.

The civet, like the natives of the north of Africa where it is found, is exceedingly treacherous, and hastily avenges the slightest injury.

The common domestic cattle, attend man in all civilized countries, and vary considerably in size and style with climate and circumstances. They differ greatly in courage and in the size of their horns, which however are not a sure indication of the amount of physical force they possess.

We have observed a very curious resemblance in character, between the breeds of cattle, and the human inhabitants of the countries where they reside. Thus the Spanish bulls are the most excitable and easily provoked to gore, the most jealous and revengeful amongst cattle; as their masters are amongst nations. The least question with regard to females, is sufficient to make both Spaniards and Spanish bulls, ready "to bore a hole" in you.

French cattle have very powerful horns, which as the admitted emblems of power, may typify a strong government. The average weight of the French cattle is not equal to that of the English breed; neither do the French equal Englishmen in gravity. We have like our cattle, more powerful physical constitutions than the French.

Our bulls are much larger than those of Germany, and have more courage and strength. They are difficult to rouse but have enormous strength, density and solidity and are rather heavy in their motions.

The Englishman was by Swift called "John Bull." This nickname has been felt to be so appropriate, that it has adhered to him, and become his acknowledged patronymic at home and abroad. Names of this sort do not come to be applied permanently, without some true resemblance. John Bull is depicted and described, as a stout agriculturist; broad-faced, broad-headed, large-eyed, large-paunched; with a gruff, powerful voice, rising into a fearful roar when provoked; but having much good-nature he generally goes on pretty quietly. His demands are great, and as he eats well, he gets very fat in middle life. He is clean and orderly, powerful and slow, rather than quick and elegant, but as he seldom puts his foot back when he has once put it forward; he gets on "in the long run," better than his more agile neighbours.

The British cattle consist of several breeds, all doubtless derived at a remote period from the same stock, but having now acquired different qualities. The "Devon" or long-horned breed, is of the same colour as the red-loam over which it frequently walks. It is a good breed like the people generally in Devonshire. The Durham ox is a powerful energetic breed like those who rear it. The Ayrshire cow is a most profitable one, and economical to keep, like its masters the Lowland Scotch. The Highland black-cattle and the Welsh and Breton breeds, possess great hardiness, which is especially necessary in their haunts; but they are not entitled to so high a place from an economic point of view, as the more Lowland breeds.

The human inhabitants of the Scottish and Welsh Highlands and the remote parts of Brittany, although eminently adapted for their native localities, yet appear out of their element in the rich alluvial meadows of the South. We cannot place any of these breeds of cattle in comparison with those of Ayrshire, Durham or Devonshire, neither can we compare the pure Highland, Welsh and Breton tribes with the Scandinavians.

The Portuguese kine although small, delicate and pretty creatures, show evidence of being of a degenerate breed. Were they once great bulls and cows? and are their masters the descendants of the contemporaries of Vasco de Gama?

The Brahmin bulls are mild and inoffensive in general; but can be roused to fits of rage and desperation, like their masters the high caste Hindoos, who like the rest of their race, are usually so docile.

The bison (*Bison americanus*), an animal of a medium climate,

roams to the North in summer, and to the South in winter. They go in vast herds, and are often induced to throw themselves over precipices by the blinding influence of terror; which acting in the first instance perhaps only on one of their number, may induce a whole herd to follow and perish.

They show an analogy with the Indians of the Mexican prairies they inhabit, who often "throw their lives away," to follow some reckless leader, who has persuaded them that the government is their enemy.

The Indian will probably become extinct as civilization advances. Man thus usurps the place of Man; and beast of beast. A higher life must succeed a lower. This progress is not confined to America but is general, wherever nations or inferior animals, come in contact with superior races or more powerful species of allied types. Thus the buffalo gives place to the European ox! The wild goat to the sheep! The native dog of South America to the European! The rats as well as the native dogs of New Zealand, have been subdued by the European emigrants of their respective classes. The same is said to be the case with regard to the native breeds of fowls in Africa, as having become scarce in presence of the European varieties. Finally it has been remarked that the Eastern species of cockroach (*Blatta orientalis*), becomes more numerous in Europe, as the smaller aboriginal species becomes less so.

The buffalo of South Africa (*Bos caffer*) a gigantic beast, the most powerful of the Bos genus, can with difficulty be killed by the lion, and sometimes slays him. The lion by superior sagacity, in general gets the better of the buffalo, in the end, which is notwithstanding a much larger and heavier animal than himself. Yet the lion in order to conquer, must be familiar with the habits of the buffalo, which is an intelligent though ferocious brute; so as to set art against art, and manœuvre against manœuvre.

In like manner the "British lion," was for a time unsuccessful against the Caffres of South Africa; but when he became accustomed to bush fighting subdued them, and they at length acknowledged his superiority.

The musk ox, or musk buffalo (*Ovibos moscatus*) has a thick hide, which is covered with shaggy hair and wool. Quiet and inoffensive, it roams to within a few degrees of the Pole in summer, while it seeks the lower latitudes as the cold cuts short its supply of food. Such is the life of some of the Indian tribes towards the far north; a harmless race, having little of the ferocity of the inhabitants of the more temperate regions of America. They are a thick-skinned people of the lymphatic temperament, difficult to rouse.

A temperate climate is necessary, to those animals of the Bos genus that possess great power. The northern bisons are mild creatures, compared with the southern, and the Indians of Arctic America, have little ferocity, compared with those of the far West. Great cold has thus apparently a subduing influence on the spirit of man.

In ancient times in Egypt, the rich pastures on the banks of the Nile, fed multitudes of cattle, which yielded such a valuable reward to man, that he was led to treat them as the authors of the blessings they were the means of diffusing; for they caused the land to flow with butter and milk; the produce most appreciated in primitive society. An individual of the herd possessing peculiar marks, was worshiped as the god Apis. Thus did man idolize what to his physical sight, contributed most to his benefit. The rude force with which the "ox broke the clod," to his perverted gaze, appeared mightier than the thunders of Sinai. The power of gold based on that of agriculture, was well symbolized in the golden calf. The Egyptians did not properly discriminate, between the *one* grand source of blessing and HIS instruments.

The bull is certainly entitled to important consideration, as the type of two important nations of the East and West; Ephraim (Deut. xxxiii. 17) and England. Much has been said of the mistake of valuing physical force too highly. IT IS THE PEDESTAL ON WHICH THE LOFTIEST AND SUBLIMEST EFFORTS OF REASON AND MORALS STAND. The more material carbon, and the more ethereal hydrogen, must glow together, to illuminate and warm the globe.

The sheep (*Ovis aries*) is the companion of man in the Old continent, and of his civilized brother in the New, and extends even to the islands of the wide Pacific, a faithful follower of his fortunes. Sheep are mild, docile and inoffensive, and have a tendency to congregate in flocks; a peculiarity which greatly facilitates their management, by a small exertion of force.

"The Sheep of the Flock" in a Scriptural sense, will be found in all countries, reached by "the sound of the gospel;" and it is certain that almost always where Christian missionaries have gone, sheep have gone, and shepherds with them.

Sheep are among the most dependent of domestic animals, and are completely led by their masters. This helplessness and simplicity is used in Scripture, to illustrate the dependence of man upon a higher power. Sheep run towards what they fear most, when terror overtakes them; and accept as leaders "the most timid of the flock." This is also the case amongst the typical "Sheep," who take for their guides those who "fear" the "GOOD SHEPHERD" most.

In a wild state, the rams are as numerous in the herd as the ewes, but this is not the case in the sheepfold. *Women certainly greatly predominate over men in most places of worship.*

Sheep's wool, forms the principal means of warm clothing in cold climates. This is clipped off them when alive, which is done to very few animals, as few indeed could spare so considerable a portion of their coverings. It is only those that are well clothed that can afford to clothe others.

The Semitic-European races who are typified by sheep, require the aid of some great controlling system such as Christianity, to enable them to use their high qualities for the benefit of the world. As the naked savage is indebted to the sheep for warm clothing, so is he to European nations for the Mantle of Christianity. Those who have like the semi-civilized nations of Asia, elaborate systems of their own, have the offer of a purer and holier faith. Through European commerce they can change their roughly-spun articles of home manufacture, for the beautiful and regular tissues of our looms.

The wool of the wild-sheep is not generally applicable to useful purposes. There is an impurity about the civilization of the East; but as it is *civilization* to a great extent, it is a barrier to that of a higher type. Nations who are already addicted to an elaborate toilet, do not like savages at once attire themselves in the garments of superior races.

The wild-sheep having to provide for its own wants, develops those qualities most useful to itself, but not those most valued by man; who seeks a useful servant. The juicy chops, so valued by our epicures, cannot be cut from its body, its kidneys are not well covered with tallow, and its legs are too long, to render it an easy captive, in the low pens of the civilized shepherd. Its horns are large,—a necessary defence against the wolves and beasts of prey of its native mountains. But in the plains the shepherd and his dog are the sheep's defence: there the horns are not so necessary. In many of the most highly cultivated districts, the sheep are entirely without horns.

We remarked an analogy, between the different breeds of dogs and the classes and races of men. A similar analogy exists between human races, and varieties of the sheep, which man can thus *mould*, to suit himself and the climate where he resides. The civilized is the highest type amongst men and sheep. The wild animal is not a large and profitable creature like the tame; neither does he "feed on the fat of the land;" but is turbulent and difficult to manage. The strength of the cultivated breeds of sheep resides more in the body than in the horns. But horns of suitable proportions greatly ornament the sheep.

The black sheep are usually a very inferior breed, but are preferred in some districts to the white varieties. Those with white over the greater part of the body, and black about the face and extremities, are considered particularly advantageous. They probably unite to an equal extent two temperaments; and those modified qualities which accompany them in sheep.

The goat (*Hircus ægagrus*) is stronger and more hardy than the sheep. It is more nimble, sure-footed, intelligent, courageous, and in every way better fitted to shift for itself. Its skin is tougher and makes better leather. The goat is particularly abundant in those lands bordering on the Mediterranean; such as Syria and Algeria, and the vast central country of Tartary. Goat-skin absorbs colours more regularly than that of sheep, and forms in the morocco leather, a material for which we have no efficient substitute, even with the aid of the manufacturing skill of the most eminently civilized nations.

Many breeds of goats have strong, rough hair, which in man and animals, generally indicates bodily vigour, as the fine-haired equally point to greater refinement, grace and susceptibility. The woolly hair of the Negro is not like the goat's, which resembles that of the Mongolic nations; who possess strength, coarseness, and a practical, though material turn of mind.

The camel, by far the tallest of domestic animals, is eight feet high, and possesses greater powers as a beast of burden than any other. It has great strength, endurance and docility, and thrives on the most simple and coarse food, which is sometimes also as small in quantity as it is poor in quality. Its patience under ill-usage somewhat resembles that of the ass, but its powers of resistance are infinitely greater. It is an animal that we most heartily admire. Its obedience and good temper, except at particular seasons, are worthy of the greatest panegyrics.

The Arabs have altered less than any of the great nations with whose habits we are familiar, from a period of equal antiquity. The camel also, has probably not varied so much in the qualities of its breeds, as the horse, bull or sheep. It is neither so intelligent, spirited, graceful or agile as the horse; but it is more suited for long journeys in a country abounding in deserts. It follows its master with a single-minded devotion, not to be excelled;—like the Arabs in their Monotheism.

The more intellectual nations of Europe, are less single-minded, more fit for a varied-sphere, and more capable of being altered by circumstances. They can turn their attention to a much greater variety of occupations; and although more widespread, do not maintain their position better in the home of

their race. Their breeds of domestic animals, show similar aptitudes; but they are not as long-lived as the camel.

The camel of Arabia (*Camelus arabicus*) with its one hump, is a lighter and more agile animal than that of Affghanistan (*C. bactrianus*) with its two humps, which is however larger and more powerful. In like manner the Affghans are *taller*, but less single-minded and enduring perhaps than the Arabs.

The camel owes its powers of endurance, greatly to two important anatomical peculiarities. It possesses a series of water-cells, like a honeycomb in the stomach, which filled with water previous to a journey, serve to prevent exhaustion. The animal is likewise furnished with a thick layer of fat in the region of the hump, which is absorbed on long journeys, before the other parts of the animal waste away. When in repose in a good pasture, as the vital powers are restored after an exhausting journey, the limbs and other parts of the body first recover their original bulk, and then the hump begins to swell. It is thus known by the size of the hump, whether the camel is in proper condition for a long journey.

The Arabs and Affghans, have a great many of the peculiarities, possessed by their principal beast of burden; they are equally able for the greatest physical exertion in long journeys, on a scanty supply of food. They are schooled to do without water for a long period, and are obliged to practise self-denial, to supply the lack of what God has bestowed on the brute.

The camel is a type of a faithful servant, "born in the house or bought with money" such as is sometimes found in perfection in the East. They do what they are bid, are faithful, and live on very little. Unlike many European servants they are wealth in themselves and do not tend to make their masters poor in proportion as they are numerous.

Camels kneel at their master's feet and rise at his bidding; they drink when he is done, and are willing to eat the very kernels of his dates. The resources of an Eastern prince are estimated by the number of his servants and camels, which are more generally subservient to their masters, than are the attendants and domestic animals of Europe. The Oriental servant will often contrast favourably with that of Great Britain, who is frequently sadly deficient in due respect for those in authority, and who often carries self-indulgence to an extreme point.

The lama is the connecting link between the camel and the sheep, but has not the size, docility or patience of the camel. The lama has a bad temper, being inclined to bite, and has a disgusting habit of spitting at those with whom it is offended.

Compared with the camel it is an insignificant beast of burden, but its wool is much more valuable for textile purposes than camel's hair.

The home of the lama, Chili and Peru, shows some resemblance in climate to that of the camel, Arabia and Bactriana; for these possess climates, among the driest on their respective continents. These animals were probably the original beasts of burden in their several countries. The inhabitants of Chili and Peru, show analogy with those of Arabia and Eastern Persia; but they are far inferior to them in energy, capacity and endurance. The lama and his director could never execute tasks equal to those performed by the camel and his Master. Yet the *greater* physical resources of the country of the lama, render it at present, a much more promising field of enterprise, than Arabia or Bactria.

The aborigines of Peru and other portions of South America, exhibit spiteful traits like the lama; but not the fiery energy of "the sons of the desert" of the Old World; compared with whom the South American is effeminate. Yet they bore the burdens which their masters the Spaniards and Portuguese forced on their shoulders. They made but an impotent resistance to the yoke, like the ill-tempered lama, which can only "spit at its driver."

The horse (*Equus caballus*) for his size, graceful proportions, lofty bearing and power of obeying man's commands and guidance; the high state of perfection in which he possesses the animal senses; his cleanliness and sympathy with so many of man's pursuits; is the noblest of domestic animals. He should certainly rank far above his companions of the farm; the sheep, ox or pig; who compared with him are animals of common and gross qualities.

Man the noblest of created works, requires more elaborate and careful training than those beneath him in the scale of being; and the *higher* the qualities possessed by a Man; the more does he require, and the more susceptible is he of culture.

It is said that those horses which give most trouble in breaking in, are the most powerful and spirited in the field. It is thus also with human subjects. The will being strong; the powers of opposition great; are when arrayed against you sources of annoyance; but when turned against your enemies, you have all the benefit of their force. The secret of judicious education, more consists in directing the passions and inclinations, than in subduing them. The energy of the violent and restive, as of the steady and industrious; was surely given *for*, and is capable *of* useful application.

The horse has followed the fortunes of enlightened nations over the world; its native habitat being as uncertain as the seat of Antediluvian civilization. The strength of the horse varies according to breed. It appears to have been created for man's use in all countries, having a power of accommodation to circumstances, almost greater than any other animal. The original source of the domesticated horse is *unknown;* in this it resembles the race of Man, whose tribes also are never found absolutely pure.

In the horse as in man, the greatest variety in constitution and temperament is seen. The temperaments of horses are analogous to those of men. In judging of both, the physical form should be more relied on as a diagnosis, than the colour of the hair or skin; but still colour is significant of many qualities. We have been led to believe that colour, was formerly more largely significant of qualities in horses than it is now; when the breeds were younger and the influences of climate and soil, had less time to accumulate. The same may be said with regard to the races of men. The terms "Black," "White" and "Red," meant more anciently than they do now; when in the infancy of racial types the blending of stems, the grafting of branches, the conglomeration of the divers COLOURED SONS OF CLAY, WAS UNKNOWN.

Spurzheim and George Combe in analyzing the temperaments of man, selected four of the older terms used for this purpose, namely the Bilious, Sanguineous, Nervous and Lymphatic, as pointing to the predominance of the various systems of the body and as indicating them by external signs. For these, Dr. Caldwell and the American school of physiologists, have substituted the terms *Motive, Vital,* and *Mental,* but they have not found a better term than "*lymphatic,*" which however they are disposed to ignore altogether.

In horses as in men, the temperaments are never found pure. In speaking of an animal as of a special temperament, we only indicate its predominance. The Motive temperament in horses, is indicated by great length of limb, neck and head; coarse hair; a want of grace in movement, but great endurance and love of muscular exertion. These horses can bear less exposure to rough weather than those of the Vital, and are perhaps less spirited; they are often black, and when so are the best examples of this temperament. They are analogous with the men of long limbs, and heads; coarse hair; small waists, powerful muscles, and consequent capacity and inclination for hard work; but these men, like the horses, without a good development of the Vital temperament are worn out early in life. The diagnosis of the Vital temperament in horses, is a thick and large

body ; wide head, perhaps a "hog-neck ;" large muscles ; powerful and rapid circulation ; long-wind, indicating large and powerful lungs ; good digestion and large appetite which is provided for by the size of their stomachs. Their disposition is less generous than those of the Nervous temperament, but more suited for long-continued exposure, and is spirited ; and if they have not so much strength in draught, live longer under a hard-life than the horse of the Motive temperament. When of the form we have described, the sorrel horse may be taken as the best type of this temperament.

The Suffolk-sorrel, an example of the Vital-motive temperament was a breed renowned for strength and endurance :—it combined large vital-organs, bones and muscles. In race-horses we see the Mental-motive or Nervous-bilious illustrated. These unite the highest nervous-sensibility and greatest muscular development, and but just sufficient vital-force, to carry them on at a rapid rate for a short distance ; neither their temperament nor mode of life, are consistent with a long career ; they are highly susceptible of accident, and very liable to take cold. Although the form of race-horses varies considerably, still they are mostly distinguished by relatively small vital organs, which if large would increase their weight, and render them too slow for the turf.

We have men among us, whose career resembles that of the race-horse ; it may be brilliant and rapid but is mostly brief.—Like meteors they blaze ! they dazzle ! and expire !

The Vital-Lymphatic temperament amongst horses when predominant, is indicated by fleshiness, softness of muscles and a liability to certain diseases : they are mostly light-coloured. The type is found amongst white horses, which are less serviceable but more mild and quiet, than the black or chestnut—usually distinguished for spirit. The analogues of these horses are a certain class of fair, puffy men ; who easily bruise ; who attain a good age ; but are lazy both in mind and body although "they make a fair show in the flesh." Such men do not often die of consumption or of broken hearts, but may have unhealthy skins.

The iron and dapple-gray horses, have temperaments analogous with the Motive-lymphatic amongst men, they have great muscular strength in "the type," which is a round full-shaped horse, high at the withers and with strong muscles connecting the legs with the body and a full-sized stomach. They are calm and steady, and do not show the convulsiveness of movement, characteristic of horses of the Mental-motive or predominating Motive temperaments ; but dapple-grey horses are occasionally seen with those qualities, which are occasioned

by the intermixture of breeds of other temperaments; they have retained a great part of the colour but have lost the proper form.

Mixed-colours in horses generally, point to a mixed temperament; black feet, mane and tail, with a chestnut body, generally indicating in the coarser formed horses, the Vital, and in the finer formed horses the Vital-Motive or Motive-nervous temperament. These horses have usually great strength and spirit, but are more impatient than the white, dapple-grey or bay horses; and have less generous dispositions; requiring considerable management, in order to prevent them from developing malicious tricks.

In the typical mouse-coloured horses, the Bilious-lymphatic temperament is well seen, indicating great muscular power, and but moderate excitability. It may seem ridiculous to some persons to talk "of a Mental temperament" in a horse, but without seeking to raise the question of the distinction of the intelligence, between man and the higher animals; still, most persons will admit, that an analogy exists between men and horses; some being as distinguished for stupidity and selfishness, as others are for intelligence and generous qualities.

Noble and generous dispositions, are more common amongst horses, having a long, high forehead, mild, intelligent eyes; a large brain-case, and a beautifully formed arched neck, fine hair and delicately formed limbs. There is immense significance of character, in the manner in which different horses carry their heads; we might write a chapter on this alone but our limits forbid it.

The Nervous or Mental temperament, can hardly be said to predominate in any animal, but man: still it is much more markedly seen in some than in others. The best temperament in men as in horses, consists of a nearly equal combination of all. We have seen several bay horses, remarkable for their beauty of form, roundness and grace, showing likewise a full development of those parts, where the leading muscles are found. These horses, having an excellent balance of physical qualities, are found very serviceable for a variety of purposes. They have the intelligence and generosity of the Nervous; the endurance and vivacity of the Vital; much of the muscular strength of the Motive with the calmness of the Lymphatic horses all in a modified degree; but still markedly seen; and when the amount of their good qualities is set down to their credit, it is found to reach a larger sum, than any other horses can show.

The analogue of this horse, is to be found in the Xanthous-haired races of Europe, the epitomized excellence of mankind

in intellectual activity, ardour in pursuit, muscular strength and vital force.

Colour is equally significant of qualities in other divisions of Organisms. Amongst plants as amongst horses, an analogy with man's temperaments is found. Red apples have mostly a sharp flavour, as have red currants, berberries and many other red fruits. Black fruits have an intensely strong flavour, as black currants, black grapes, and black elder-berries. Very light-coloured fruits, as white-heart cherries, white currants, and light-coloured plums, have a more delicate flavour than the red or black of the same family. White strawberries have much less taste than red, as have light-coloured gooseberries. Yellow fruits are commonly sweet and luscious, with less flavour than red or black; as for instance yellow gooseberries, yellow plums, and yellow apricots—for the best flavoured apricots are streaked with carmine. The sweet, rich and sustaining grain is golden, as is the basis of our nation's credit. These various colours, point to the various qualities of the fruits of the earth, they are not less significant of those of the sons of Adam. Red-haired races are fiery and impetuous, and have strongly-marked qualities, as in red-skinned peoples. The black-haired have even a greater extreme of qualities, but are less susceptible of improvement, than the yellow and lighter brown. Black-skinned races have likewise intense peculiarities, and their types are usually extremely permanent: how difficult is it for instance to eradicate the traces of Negro-blood:—one drop of ink will discolour a glass of clear water.

The Scandinavian, the most precious race on earth, has often golden hair. Sweetness and equanimity of temper is more commonly found amongst them, than in other divisions of mankind. The different combinations of colour in fruits, point not merely to a union of various qualities, but typify similar combinations in men. Thus the yellow and red apples, mangoes, tomatoes and the woody nightshade, are both sweet and sour, or have other divers qualities. Similar remarks may be made with regard to streaked gooseberries, variegated strawberries, melons, and a vast variety of other fruits, which have their prototypes amongst men with yellow hair and dark skins, black hair and fair skins, or dark hair with bright complexions. Fruits which longest retain their good qualities, are seldom black or red; and dark and red-haired races have generally less evenly balanced frames, and consequently do not live so long as those of more mixed colours.

Lastly those fruits which show great paleness of colour and a want of flavour, have analogy with albinos, or those who from extreme fairness have a bleached appearance. Such are gene-

rally characterized by a want of vigour. Those eggs of the common hen, which are distinguished by a rich flavour, have usually a tinge of yellow on the shell, and yolks of a strong yellow, have much more taste than the pale-coloured. The eggs of wild birds which have most flavour, are strongly coloured, such as plovers', bustards', whimbrels', blackbirds' and many gulls'. The dark eggs of the black-headed gull, have much more taste than the light and spotless ones. White or pale eggs have much less taste as those of the owl, starling, linnet, greenfinch and wryneck. The eggs of the petrel, though white are distinguished by a strong musky flavour; this however appears to proceed from the green oil which comes from the body of the parent bird, and does not properly belong to the egg itself. Honey has also generally a stronger flavour, when of a yellow than of a very pale colour. Yellow sugar has more taste than white; and the dark sugar of Cuba, of an earthy brown colour, has the strongest flavour of all. Milk when of a cream colour is much richer in taste than when blue, and butter when of a deep straw colour, has much more flavour, than when pale in colour. Red wines abound more in bouquet than white (pale pink or yellow): they have more pungency, but in general less sweetness.

In considering the scent of flowers with reference to colour, we find that those of the *same class*, of yellow or red tints are strongly scented. Thus the white clover (*Trifolium repens*) has less odour than the purple (*T. purpurea*), or the yellow hop trefoil (*T. procumbens*); the white rose than the red; the white than the yellow tulip. The white hyacinth (*H. orientalis*) has a more delicate smell than the deep-coloured. The white lilac has much less scent than the purple. The red clove-carnation has a much stronger smell than the white. The *colour* in all these plants is not the *cause*, although the accompaniment of this odour: it merely indicates in them as in other divisions of organisms the degree of strength or balance of qualities.

The colour brown in insects, the higher animals and man, is the accompaniment of great vigour and endurance; as in bees, ants, dark chestnut horses and human Arab races. Red represents the fiery and hot-tempered in insects, horses and red-haired people. Black represents sharpness, with a great deal that is restive and a considerable impatience of control, with as great activity but with less vital force than red. This is especially true of black insects, fowls, horses, and human races.

In the different breeds of horses in various countries, we see analogy with the races of men.

The choice breeds of Arabia, were long considered the finest

horses; and possess courage, generosity and endurance not to be excelled even in England, where "horse-flesh" has attained its highest state of perfection. Unlike most English high-bred horses, they are easily fed, and their stable,—when they have one at all, is of the simplest kind.

It is clear that the British, have now surpassed the standard reached by the ancient Semitic nations; and are infinitely before their modern representatives in the East; who like the Arab horses still show much endurance, notwithstanding their relatively scanty numbers.

The Tarpan horses of Tartary, which roam round the sea of Aral, are almost as vicious and difficult to reduce to obedience, as are the lawless, thieving inhabitants of Khiva.

Are writers correct who place the seat of primeval civilization in Tartary, and adduce as an argument, the probable fact of the bulk of domestic animals, being indigenous to that country? If Tartary be not the home of the horse, where can its native place be? Can it be Arabia, one of the seats of early civilization?

The Muzin or feral horses, have larger heads and shorter necks than the Tarpans. These show a resemblance to the big-headed nations who tame them; who have better qualities than the Khivites.

The Tarpans have a violent antipathy to tame horses, which they attack furiously; and in general will not breed with them. The Khivites isolate themselves in a similar manner, and show equal antagonism to other divisions of the human race.

The feral horses and their human types, intermix with their neighbours; and are more capable of culture than the Tarpans and the Kivites.

The horses of Egypt, so early famous, were strong bulky creatures, but rather slow in motion; which latter peculiarity their masters displayed. The civilization and horses of Egypt, took a prominent part in "the world's stage," at a period prior to the rise of the Four Great Monarchies. Indeed some think that the Egyptians, were the nation who first reduced the horse to subjection; and there is no doubt that they were among the earliest, to learn horsemanship.

The Chaldean horses next became celebrated, as civilization culminated in that mighty empire.

The horses of Xerxes are much spoken of by Herodotus and other writers. They shared the vicissitudes of conquerors; many perished with the army of the Persian King, and many, when the invasion of Greece was returned on Asia, took their part in the toil and triumph. The Persian horses were the most celebrated of those of ancient countries, for every grace,

spirit and vigour which we are accustomed to admire in this animal; and received in the ancient language of the country, a name signifying "*wind-foot.*"

The Armenian and Median horses, which in early days attained a large size, were used by the Persians as baggage animals, and for their war-chariots.

The Gothic or Scythian nations, carried into Europe excellent horses, which possessed like themselves a high degree of hardness and endurance.

The Roman horses like the citizens of Rome, came from an immense variety of localities.

The Barbary horses were early brought from that country into Spain; and perhaps contributed eventually, to the formation of the jennets; a high-spirited and noble breed. They showed an extraordinary amount of freedom of movement, and were of the same stock probably as the Lusitanian or Portuguese horses; which according to Justin, were "born of the winds." These were the types of the Moors;—emigrants from Africa, who so greatly contributed to the advance of civilization in the Peninsula. These were suitable ancestors of the cavalry of Cortes and Pizarro, whose passages over the field of glory and of fame, have shone like sheet lightning, from East to West;—to be replaced by grey gloom.

But the horse that can perform the hardest work for the longest period, is to be found in more northern regions which also possess breeds, having the greatest swiftness of paces. The British horses were famous when Julius Cæsar invaded the country, and some of them were carried by him as trophies to Rome; but they were afterwards modified by intermixture, with the animals of Italy, Gaul and other countries.

The Britons were a fine race of people at the time of the arrival of the Romans, and had made considerable progress in civilization. The system in existence in the British isles was shattered in contact with that of Rome, which took the place of the falling edifice; but the Roman power at last fell to pieces by its own weight. For some time after the period of its decline in Britain, the breeding of horses was much neglected, but when the Saxons began to exercise an influence in this island, attention was given to the improvement of the stock of this valuable animal.

In the reign of King Athelstan, the English nation began to grow in importance, and the breeds of horses also rose into celebrity. The infusion of Norman blood, greatly invigorated the human population of these islands; and the introduction of Norman horses, had an equally benefical effect in raising the standard of the equine race.

During "the wars of the Roses," horses were much neglected and consequently greatly degenerated. At the period of the *Renaissance*, their breeding received more attention than it had attracted for many years ; for most departments of knowledge and industry, received a great impulse. The wise Henry VII. of England, did his best to improve "horse-flesh," and among the good deeds of his successor, may be mentioned the laws passed by him, for the regulation of the breed of horses. He was enthusiastic on the subject ;—appeared to have a real affection for the horse ;—and was a skilful rider. Henry VIII. resembled a Tartar prince in some peculiarities. He liked a variety of wives ;—had an irascible temper ;—was extremely impatient of control ;—had little regard for human life ; and gave a large share of attention to the breeding of the horse.

The English breed of horses, improved much during Elizabeth's reign, but they gained perhaps more in strength than in speed : emblematic of the state of manners, in which strength and power, exercised more influence than refinement and delicacy.

James the FIRST introduced from Scotland a love of horse-racing ; and was the first of a line of kings, who did much for the turf.

Charles the SECOND was one of the best horsemen of his time ; and firmly established a taste for racing, by giving silver cups and bowls to be run for. This was coincident with growing civilization.

James the SECOND was not less addicted to sports ; but his successor William the THIRD, was more inclined to encourage useful horses for riding purposes, than racers. He introduced much foreign blood into "horse-flesh," as might have been expected from one, who was not only a foreigner, but who greatly encouraged the foreign element in this country.

Queen Anne and her consort Prince George of Denmark, did much for horse-racing ; but the sport had now become thoroughly naturalized in England. To this reign is traced the origin of some of the best races now extant, which sprang from the celebrated "Darley-Arabian," the progenitor of so many splendid animals of our own day.

Cart-horses are more useful than racers and light riding horses. There is something very "Gothic" in the gigantic cart and dray horses. Grand in movement, noble and independent in bearing, yet willing to the utmost, to act the part of servants; they may typify our hard-working population, alive to the dignity of labour and of the moral importance of being good servants to the state.

Cart-horses are slow in movement, but by far the most

powerful of all breeds; they have often noble, generous qualities. They are of the Sanguine-lymphatic, and Sanguine-bilious temperaments; which must be united with highly Nervous blood from another parent, if we would rear a race of useful half-blood horses; fit for the greatest variety of purposes. These "cob"-horses which unite the qualities of two classes of animals, may typify "Middle Classes" in English society, who can adapt themselves to a greater variety of occupations, than those above or below them; having great physical strength, as well as great mental activity.

Some Irish horses have been good racers, but they are said to be more angular in form, and hotter in temper than most English breeds;—thus truly Hibernian in their proclivities. Gothic horses, show an inclination to stoutnesss and weight of body, which those bred in the deserts do not display.

The Arabian horses are more lightly made, and more sensitive in their nerves than the Gothic; and are more quick and acute in their senses. Similar remarks apply to the races of men inhabiting those countries. As the most remarkable nations, have sprung from the combination of tribes possessing divers, but harmonious qualities; so the most generally useful and valuable horses, are the product of the union of greatly differing breeds. The Man not for one age; not for one country or one purpose; but for all time, can alone originate thus;—and the Horse *par excellence.*

Man can breed horses and other animals, suited to his purpose, and produce modifications in them in accordance with his will. He can perpetuate and increase peculiar qualities, and subdue others, until they gradually approach his ideal. The same laws which regulate the breeding of animals, influence the offspring of Man. Judicious "selection," which should be no means "Natural," should bear on this important matter. The lessons taught by history, physiology and mental philosophy, render clear to us how *transmutable* Man's qualities are, and how he has himself in his own hands. Surely Man should not regard himself *less* than the brute! If he can improve the race of his domestic animals; if he can increase their good qualities and remove their defects; if he can increase their defects and lessen their good qualities; surely he is bound to apply the same principles with *discrimination*, for the benefit of his own Race.

"Physician heal thyself," was an old proverb in the days of our Lord, and we in this enlightened age; the heirs of the science of all time, are doubly bound to attend to the physical and moral improvement of our species. For all History informs us, how vices, diseases and short lives are *hereditary;*

and how long life; morality and intelligence, are alike TRANSMITTED FROM PARENTS.

The wild ass (*Asinus onager*), the most savage of its genus, inhabits the deserts of Arabia and Persia. It is proverbially fleet in movement, and almost defies the pursuit of the swiftest horseman. Like the Tarpan wild race of horses, it furiously attacks with teeth and hoofs, its allies in a domestic state.

Asses are content with, if they do not prefer a coarse diet. The harshest, most bitter and unpalatable herbs, rejected by the ox and horse, whose mouths they would injure, are eaten eagerly by the ass, to whom as being succulent food they are especially refreshing; and in the desert partly supply the deficiency of water. Although the ass is so wild, fierce and spirited in its natural state, yet when caught, after a while it sinks down into a calm and patient drudge.

There is considerable difference of opinion amongst naturalists, as to the wild species from which the domestic ass is derived; but its origin is very commonly attributed to the "Onager."

The ass, although the emblem of folly in man from the most ancient times, by no means excites our laughter, unless when its voice "is heard on high." The greatest fools are not those who have the least capacity; but those who attempt what is beyond their powers; and speak when they had better be silent. Were they content to act an humble part, they might even like the patient ass be esteemed.

The muscular system of the ass is so large and powerful, that we are not surprised that it should be able to carry immense burdens, in proportion to its size and weight. It is of the Bilious or Motive temperament, or that in which the fibres of the body are especially strong, for in their firmness its muscles resemble metallic wires covered with leather. Its skin is exceedingly tough, and forms a useful leather much used in the East.

The ass it must be confessed, is worthy of more consideration than it generally receives in England. It can never rise to the nobility of the horse of high blood; but still the asses of Spain, Persia and Egypt, are far more admirable than many "hacks." In like manner, we see a great superiority in the more respectable and better specimens, of the natives of these above-mentioned countries, to "the scum" of our population. A fine Oriental character is much to be admired; a courtesy and reverend deportment pervade it. Such an one is spirited, poetical and loves freedom, and will not be guilty of those acts of impurity and grossness common to our recreant classes, who are not influenced by the restraints, which govern the better specimens of the Arab or Jewish nations.

The ass shows much cunning, excessive obstinacy and love of contradicting; often perhaps the result of capricious and violent treatment in youth; which have similar effects when applied to man. The patience of the ass is often the result of insensibility, for its temperament is often bilious-lymphatic which in beasts as in man, is accompanied by an insensitive Nervous system.

It has been said that the wild Arabs of the interior of Arabia, are far superior to those in the neighbourhood of Egypt; and we suppose that even the celebrated Egyptian asses, do not approach the original wild stock, either in symmetry or bodily vigour.

The mule between the mare and the ass, is that with which we are most familiar, it possesses some of the peculiar properties of both parents. It is exceedingly tough in muscle, and acute in observation; which is united with extraordinary obstinacy. The mule being less influenced by sexual feelings, is harder, less gentle or tender in its nature, and more selfish than the ass; but its other instincts appear more acutely developed.

Some persons resemble the mule in disposition. They have commonly little sympathy with the opposite sex, and are generally cold and unsympathizing; but are quick and shrewd in the ways of the world.

Mulattoes in Great Britain are born mostly of Negroes and White-women; typified by the offspring of the ass and the mare; while those born in other lands, are mostly from White-fathers and black-mothers; which illustrate the Hinneys. The former are said to be superior intellectually; while the latter have better physical constitutions. Mules born in this country, contrast in the same manner with those of other lands, and present similar analogies with Man. These Mulattoes are good servants; in fact they are rather better than pure Blacks, although inferior as Moral characters, and usually very obstinate.

The tapirs approach the extinct *Paleotherium* of the Paris basin, and are thus connecting links, between recent and fossil Mammalia. Two species have been noticed, each peculiar to an opposite division of the globe.

The *Tapir americanus*, is the gentlest of its tribe, for it does not attack any animal unless driven to desperation. It is the largest mammal that inhabits the dry land of South America, and in appearance, resembles the elephant as well as the pig. Its strength is enormous, and its skin is too thick to be easily pierced. Its food is similar to that of the elephant; but it also swallows a miscellaneous quantity of rubbish. It has great power of adapting itself to circumstances, for it is found in most parts of the continent of South America independent of latitude; which is certainly an extraordinary geographical

range for a herbivorous animal. Although usually inoffensive, yet it sometimes bites furiously, dogs, or other animals venturing to attack it.

The Pachyderms like other divisions of the fauna of the Old World, are much more vigorous than those of the New. The tapir of America, is insignificant compared with the elephant and rhinoceros, and may represent Nations which are relatively weaker and more effete than those of the Old continent; as do also the feebler animals of other classes. The puma of South America, we formerly compared with the Republics of that country, which prey upon the aboriginal populations, as that feline beast does upon the tapir.

The Malayan tapir (*T. indicus*) is the representative of the elephant in the great isles of Sunda, and a type of their less civilized Human population, as contrasted with that of Asia and Ceylon, the home of the colossus of the forest.

The Buddhist nations of Ava, Birmah and Ceylon, are a civilized People compared with the Malays; but with all their intelligence they are gross in their manners. They may be typified by the elephant; who with his many interesting traits of character is still a most uncouth animal.

The coney or *oueber* (*Hirax syriacus*), is an animal frequently mentioned in Scripture. It is said to be feeble and to seek its refuge in the rock; a habit of this animal in the present day. It does not burrow in the earth like a rabbit, but takes up its dwelling in the crevices of the rocks. This feeble animal in these situations, is thus secure from the attacks of enemies that it could not otherwise resist.

The coney taking refuge in the rock, as a scriptural illustration, is intended to convey a lesson to the weak, to take refuge with the strong. The rock being hard and enduring can never be moved; whereas the burrows made by rabbits and other animals, are liable to be crushed by the foot of the great beasts of the earth. The habitations raised by Man, for his protection, may in a similar manner be destroyed by his foes.

CHAPTER XII.

THE RESEMBLANCE BETWEEN MAN AND ANIMALS.—*Continued.*

ELEPHANT — RHINOCEROS — HIPPOPOTAMUS — PIGS — HOG-DEER — PECCARY — ANTELOPES — CHAMOIS — GNU — ELAND — NYLGAI — ELK — REINDEER — RED-DEER — GIRAFFE — MUSK-DEER — SLOTH — ARMADILLO — ANT-EATER — MANIS — ZEBRA-WOLF — KANGAROO-RAT — WOMBAT — DUCK-BILL — WHALES — DOLPHIN — PORPOISE — GRAMPUS — NARWHAL — SPERM-WHALE — GREENLAND-WHALE — RORQUAL.

THE elephant (*Elephas indicus*) is the most gigantic of recent terrestrial quadrupeds. Its unwieldly extremities which are of little use for prehensile purposes, are compensated for by its trunk, one of the most wonderful organs in the animal kingdom, which is a bundle of 40,000 muscles!—whose touch is at once delicate and powerful according to the will of the animal; capable of picking up a hair or of lifting half a ton! This creature with a most gross exterior, unites an intelligence equal to that of any other brute; and when in a captive state shows so many excellent qualities, that we greatly admire its character.

The external appearance of the elephant, illustrates its characteristic qualities; its trunk represents its intelligence, and its feet its grossness. The anecdotes related of its instincts are marvellous,—how it appears to reward favours, and revenge injuries, even when a long period has passed. Like most noble creatures, it must be treated with justice and moderation, or it cannot be made a useful servant. These animals are captured in a curious manner, with the aid of trained female elephants, which seduce them into the toils of the hunters. The males being much occupied with them, forget their ordinary instincts of prudence. Elephants in general are soon reconciled to their captive condition, and with judicious treatment become faithful domestic animals.

Those who are most elephantine in size and strength amongst men; great fleshy cumbersome creatures, with coarse, broad hands and feet, and who tower over their contemporaries in height, are not unfrequently, like Hercules and Samson, easily

led captives by designing members of the softer sex. They not only yield themselves to these, but become the prey of sharpers, thieves and jewellers of their own sex.

Elephants are frequently caught in pitfalls, which are deep holes dug in the soil and covered with branches of trees, over which the gigantic brute steps, when they yield to his weight and he falls into the pit below; perhaps maimed, or at least kept a prisoner till despatched by his enemies.

Such is the fate of some men who are *great* in nothing else but size, and whose figure reminds us of the physical part of the elephant's nature. His more intellectual character, as well as a certain resemblance to his *physique*, is shared by a few men whom one stares at, and who are interesting, but surely not beautiful. They have tenacious memories, are strict in fulfiling and performing engagements, and learn a great deal from personal observation. They are inferior to the elephant in modesty. Here is a portrait of a gentleman, sketched by one who sat opposite to him at a dinner table.

Like the elephants of Germanicus he could behave decently at dinner, and like these animals he had a very long snout, which we suppose must be called a hooked nose. He had lost his teeth, and his nose hung down over his mouth. His underjaw was prominent, and his thick under-lip came up to meet the long nose, and nearly attained that object. He was obliged to push this flexible organ on one side when he took wine with a lady. He had broad flat ears, which might poetically be compared with fig-leaves. "A constitutional asthma" was his excuse for a decided habit of grunting, when he agreed with the speaker. In his last moments he became still more like an elephant, his feet swelling to enormous dimensions.

This man was a worthy wine merchant of Bordeaux, who was anxious to have a third wife. He named the subject to his customers and wine-growers, and was shown a lady only fifty years younger than himself. Through "the arts" of the young lady herself, this "Old Elephant" was induced to take her without a portion, and under the influence of his best wine, to sign a most advantageous settlement. The young lady who possessed great beauty, was united to this interesting elderly gentleman. The happy couple were taken in the same photographic group, "January and May" over again;—loosely-hanging skin and treble chin, contrasting with a fair round face and bright complexion;—a second edition of "Beauty and the Beast."

Anxious to know the qualities of an individual of such a peculiar aspect, we made enquiries of his intimate friend. He was described "as a person of great observation, and with

much intelligence of a certain kind, but with little refinement." He was faithful to his friends, but inclined to be revenged on his enemies. His habits were sensual, and he remembered most things in connexion with a good dinner, or a bottle of good wine; wanting which his temper was of the most irascible kind.

The Rhinoceros's skin, is of immense strength, thickness and toughness, difficult to pierce, and hangs like leather about the animal. The rhinoceros possesses but a low degree of nervous sensibility, and as might be expected its sense of feeling is not at all acute; so that a tremendous whipping is necessary to rouse it. Its eyes from their high position on the top of the head, are not adapted for discursive observation, but the defective senses are greatly compensated for by a wonderfully acute sense of smell, of which the enormous development of the region of the nose is an indication. Considering its great powers its shows little courage, but at certain seasons, will encounter any animal that comes within its reach, "running" a sort of "muck" at every one; in which it shows a resemblance to the otherwise non-sensitive Malay-race, who appear often so indifferent to physical suffering.

The rhinoceros is indolent compared with the elephant, and loves to roll in marshy, swampy land, and to lie all day with little motion. It is moderate in its appetite considering its bulk, and is not omnivorous like the pig. Its small unpleasant eye, indicates apathy, indolence, and a want of docility.

The rhinoceros family, represent savage, barbaric power amongst Empires and Nations. In India the Empire of the Great Mogul, was typified by the one-horned rhinoceros (*Rhinoceros unicornis*) of that country. Like that animal it was mighty but lethargic; unintelligent and cumbersome; but could not be easily crushed by force. The *Rhinoceros tichorinus* which once roamed over Europe, may represent the Roman power. The rhinoceros of Abyssinia, may illustrate the fierce Gallas Princes; and those species peculiar to the great Isles of Sunda, may also typify the Sultans of the country.

In the Middle Ages it was supposed that cups made of rhinoceros horn, possessed the power of discovering poison in wine;—a curious delusion, which could only have arisen, from the fact of the horn effervescing with strong and poisonous acids.

If we examine the structure of the hippopotamus, we see how beautifully it is adapted to its habits, as most other animals are found to be when closely scrutinized. It is not carnivorous, but subsists on herbage, green crops, or the roots of aquatic plants. Its disposition is most savage towards man

and beast, whom it does not hesitate to attack on land or in water. It often upsets the canoes of the Negro traders, and can easily crush their frail sides with its teeth, or with less effort mangle the head of the wrecked voyager. It may however sometimes, as it rises from the bottom, upset a canoe without a malicious intent. Just as a spear thrown at random by some ferocious Negro, may cut short the career of an enterprising traveller.

The hippopotamus being amongst the most savage of animals, properly typifies the lighter-coloured Negroes and Bosjesmen of Africa, who resemble it in some points of character. This animal is without a horn, and the Bosjesmen are without Great Chiefs.

We once met with an individual whose deformed countenance, had a slight likeness to the hippopotamus ; his head was flat, his forehead low and nose short. His whole muzzle was excessively broad and the nostrils very open. He was brutal, savage and coarse to most persons he encountered, but had a fondness for his children, similar to that which animals have for their young, but none of that high-toned feeling which leads parents to educate their offspring well ; so he brought them up in the same swinish way in which he lived. Conscious of his great strength, he treated those with whom he came in contact, either with surly contempt or rude ferocity. He accomplished nothing by conciliation, but much by the crushing weight of his own unwieldly body ; his physical power and bulk being immense.

The pig (*Sus scrofa*) is an animal most differently regarded by nations, and is in itself a very variable creature according to breed ; which does not however, so much differ with the climate as that of most animals. The manner in which this animal is treated by different nations, is in harmony in most instances with national origin and filiations. Those nations now regarded as Semitic, abhor this creature ; while the Japhetic and those nations who have been lost amongst them, set a great value on the porcine race.

Persons of a low caste, evidently allied to the Melanic children of Ham, are in India and some other countries, the breeders and keepers of swine. The pig is more nearly typical of the true Negro than of any other nationality, if we except the pork-eating populations of China, Tartary, the Indian Archipelago and Polynesia ; where pig-life and pig-manners, attain their greatest development. But the British can breed pigs which equal in coarseness those of any country. A debased Briton is one of the most awkward and sensual of men, equaling in these respects the untutored Savage.

The pig's prolificacy, surpasses that of all other animals of nearly equal size. Its coarseness and savageness of manners, its undue amativeness, which it is always ready to gratify, is shared by the less chaste and more corrupted nations, who are worse than the British in general; but whom the British occasionally exceed in debasement.

The Chinese pigs are much more concave at the root of the nose, than our hogs. The same observation may be made with regard to the noses of the nations. Yet our lowest classes, whom we think frequently show evidence of Mongolic affinities, have sometimes this concavity at the root of the nose. Those persons who possess superior mental qualities, have seldom very low noses; and those pigs whose instincts are the most acute, such as those of the wild boar, have—for pigs—High noses.

We shall now consider individuals of the human species, who resemble the genus *Sus*. They are mostly "scrofulous," which is but a synonym for *pig-like*. An eminently scrufulous constitution, is consistent in man with great amiability of disposition; but the resemblance to the pig is not carried to a great length, in these cases being only "skin deep:" they both are subject to similar complaints. The true porcine-men, are very narrow and selfish in their sympathies, and care only for their own advantage and that of their offspring. They are acute in their instincts, and have an accurate knowledge of the value of common things, beyond which they do not care to go; for all their attention is generally given to their own concerns. Like pigs they snore and snort much in their sleep, of which they take a great deal. They awaken slowly, and are apt to be at once seized with a ravenous desire for food, over which inclination they have little control.

It is certainly the case, that in man the habits of life influence the style of countenance. And what is more, an assimilation is constantly going on, between classes of men and the animals they most associate with. Racial proclivity assists this assimilation in some cases; for the Mongolic and Finnic races, show a much greater resemblance to pigs, than do Caucasian nations. The individual we are about to describe, might have been,—as some of the lowest of the inhabitants of these islands are believed to be,—of remote Finnic extraction.

Pigge Wiggins, called after his uncle Pigge the grocer, excited much ridicule amongst his schoolfellows on account of his name, which was however highly appropriate to one, whose appearance and habits so much reminded the most casual observer of the hog. He had a peculiarly sonorous way of eating, for which he was generally disposed, and as might have been expected his waist eventually became his thickest part. His eyes were very

small, but prominent, and without much manly expression. His nose was long, broad and hollow; it was decidedly turned up, and described a segment of a circle, from the tip to the eye-brow.

He had much intelligence, but was never known to perform a truly generous act, or appreciate the pure, lofty and elevated. His father bound him apprentice to a cattle dealer, and he at last rose to be an extensive pig-merchant, and thinking himself of mighty dignity, insisted upon being called "Squire Wiggins." Those who live much on pork and gross food, and are low in habits of living for many generations, may become brutalized and degraded to the level of "Pigge Wiggins."

The Wiggins family for four or five generations,—which is as far as we can trace,—had been farmers of most grovelling habits, but wealthy for their station. Persons like "Pigge Wiggins," although gluttonous for food, yet do not care to see others well fed at their expense; being grasping, they stuff themselves, but no one else. Such men seldom come within "the gripe of the law," although they practise adulteration, and the sale of diseased meat, when it can be done with impunity. As they are not fond of hard-work, they mostly avoid mechanical trades, and choose easy or profitable businesses, like those of publicans or small brewers.

White pigs are more sickly than mottled or black pigs, being of a less mixed temperament. Extremely light-haired "porcine-men," according to our observation are fattest; but the dark-haired are the best, being the strongest and the least repulsive.

The hog-deer (*Babirusa alfurus*), is a ferocious creature, and at certain periods attacks almost all it meets. It goes about in herds, feeding chiefly on rice and maize. It is more elegant in form, and graceful in outline, than any of the pig family. In which it resembles its compatriots the Malay natives of the Moluccas and Sunda Isles; with whom it would be well to contrast the purer Melanic races, and the domestic swine they keep. The Malays, like the hog-deer, are fearfully excitable, restless, independent and not to be trifled with; but when enraged must be killed outright as an example to others; as also must be done with these hogs, when they too "run a muck."

The hog-deer takes to the wàter with ease, swimming across straits and narrow arms of the sea without much difficulty. They are more excitable than other hogs; and as a usual accompaniment of a high amount of sensibility, they are more refined in appearance.

The white-lipped peccary (*Dicoteles albirostris*) represents the wild boar in South America. It is gregarious, and when

in great numbers does not hesitate to attack men or horses, surrounding them and ripping them up. But singly or in small numbers, they are commonly shy, like such wild tribes as the Tupi, who skulk into the recesses of the forest at the approach of the European traveller; but attack him with fury when they greatly outnumber him.

The collared-peccary (*D. tajassu*) from its solitary habits is a comparatively harmless species, and it is also milder in its expression and disposition, than its white-lipped congener. Yet it can defend itself with great valour, when hard pressed by the hungry hunters;—as the Aturian Indians did, when on the point of being eaten up by the cannibal Caraibs.*

The antelopes are divisible into three classes; the Cervine, the Bovine and the Equine. As a type of the first class, we take the aerial gazelle (*Antelope arabica*) which is graceful, beautiful in markings, and has large, bright and melting eyes; to which those of oriental females are often compared. With all its beauty the gazelle has little intelligence, although its playfulness and grace, render it attractive to the eye.

Lovely but uneducated Eastern women, have these ensnaring qualities, which enchain, but do not elevate any but the lower orders of mind. Such have many animal graces; but little of that companionable intelligence, which ought alone to retain the affection of the civilized Man. And it is well for him that such is the case, and that he is not long under the influence of the uncultivated.

The chamois (*Rupicapra tragus*) allied to the goats, is one of the most nimble of Ruminants; and its fleetness is as extraordinary as its agility. It has a considerable amount of intelligence, which enables it to adapt means to ends, and which combined with its watchfulness, renders it exceedingly difficult to approach, in the mountainous districts it inhabits. Its love of freedom is so strong, that captivity does not agree well with it. It may be pursued and killed, but it cannot be domesticated; and to hunt it in its native haunts, is one of the most perilous of occupations, not to be followed except at risk of human life.

We see in the chamois, an analogy to the Natives of the Alps and Pyrenees, who are at home in their mountains, and difficult to approach in a hostile manner. They may be subdued and caught by those desperately resolved on the undertaking; but we question whether the success is worth the cost. It would be but a barren triumph, producing little profit.

The white-tailed gnu (*Catoblepas gnu*) that traverses in great herds the interior of South Africa, is one of the must curious

* Humboldt's Views of Nature. Bohn's edition, p. 172.

of quadrupeds ; linking the three important families of Deer, Horse and Buffalo. The general effect of their colour on the eye is that of a deep umber, not quite black; which is scarcely distinguishable when they are running at great speed. Their tails and manes are greyish. They are compactly-formed, well-proportioned, and possess great strength and agility. It is often difficult to approach them even on a swift-horse. They can make a formidable defence against beasts of prey, have been known to attack man, and to trample on and gore him to death ; for the large herds in which they congregate, would be formidable to an armed regiment. Their eyes are very fierce, their noses broad, and their whole aspect when excited, inspires terror.

We see in these antelopes, a resemblance to the Zoolus and Caffres ; the probable result of an union of the three branches of the "Human Family." They are fierce, and crush any that fall into their power. "They can make good use of their legs" in running from an enemy, although their ferocious aspect is quite capable of terrifying him ; their eyes rolling like those of the gnu and showing the whites only. Caffres are not quite black, but much darker than Bosjesmen, and some parts of their bodies are of a lighter colour ; yet the head is covered with very black hair. In order to conquer them, stratagem must be used. They can be domesticated as well as the gnus. Dr. Colenso relates a memorable anecdote of a tamed Zoolu.

The eland (*Oreas canna*) a type of the bovine antelopes, is a gentle, graceful creature, and showing great capacity for being tamed, may be useful to the farmer, unlike most of the animals of South Africa. It varies a good deal in size and colour. We see in them points of contact, between the antelope and the ox. They may be compared with the Bechuana tribes, whose mildness give hope, of their being useful auxiliaries to the civilized settler.

The nylgai (*Portax picta*), a fine species, is a native of Affghanistan and the north of India. They vary from greyish-black to yellow-bay. They are powerful animals, only second in this respect to the moose among the stags. They can be domesticated and trained for harness, but are sometimes violent and ill-tempered in their captive state. We see in them analogy to the tribes of Northern India, who variously dark and fair, can be useful when bent to the yoke. But their fidelity and steady conduct, cannot always be depended on ; and if not treated in a most judicious manner may become exasperated against their rulers, and do their best to injure them.

The moose or elk (*Alces malchis*) is an enormous creature, and far exceeds any of its tribe in bulk. It roamed,—or a species

nearly allied to it—through many countries; but it is now extinct in most of them. It is not suited for civilized life, or for thickly-peopled districts; but it can be tamed, and may be used for purposes of draught. Its movements are clumsy, yet it is capable of maintaining its speed, longer than almost any other quadruped except the reindeer. It is simple in its habits and solitary in its life.

We consider the moose a type of those fabulous "giants," who in early ages were said to roam over northern countries, but who have now disappeared, and only their skeletons remain; the legacy of time,—food for Anthropologists to Eat.* Scandinavia, Poland and Borean-America, are yet in a more primitive state, and can therefore endure the presence of the elk, which however will disappear as civilization advances.

The reindeer (*Cervus tarandus*) is likewise an inhabitant of Arctic-Europe and America. In Lapland it takes the place of the horse, cow and sheep; for it is excellent as a beast of draught, and as a milker, and its skin yields a most effectual protecting wrapper against intense cold. It is remarkable for its swiftness, and power of long endurance, in which it probably equals the camel and surpasses the horse. It resembles these animals, in being the most useful friend and servant to man in its native country. Although beneath *them* in intelligence and strength, yet it is as suited to its Arctic habitat, as they are to their homes.

The reindeer is not adapted for a temperate climate, as has been fully proved; several careful but unsuccessful attempts having been made to introduce it into Great Britain. In like manner the Laps and Esquimaux are unsuited to our climate, not retaining their health or living long here. Both apparently require a protracted and rigorous winter, to burn up the excess of carbon in their bodies, which would otherwise accumulate and disturb circulation. Those who visit these northern countries, find both the reindeer and their masters,—particularly the Laps,—indispensable.

The red deer (*Cervus elephas*) is the favourite, and the noblest animal of chase, in this and other countries of Europe. It is however timid, except when excited by sexual instinct, when it rushes furiously at every animal it encounters. Its timidity and comparative harmlessness, have rendered laws necessary for its protection in those populous countries, where it is highly valued as an object of chase. It much enlivens our mountain forests, giving in many instances, the spirit of life to a grand, but cold,

* Reference is here made to the large bones of men occasionally found in different localities, which are variously supposed to belong to "Giant races," "Pre-Adamite men," "Sons of Anak," or "the Reindeer Period."

THE CHASE OF THE GAZELLE. Page 325.

grey, and dull landscape. With all its timidity this splendid creature carries its head in a lofty manner, but its watchfulness renders it difficult to approach, unless by the most careful precautions.

We think these deer typical of an aristocratic class, who do not—as usual unite noble actions to noble birth, but have a handsome exterior with much physical power. The stags have great facility in pushing with their horns, and their principal energy is seen when they are in love. A class of tall and handsome individuals exist, who are of little profit to society; but who are capable of occasionally rendering themselves very disagreeable to others by their pushing manner, which is most seen on the occasion of an amour. The noses of the persons to whom we refer are long, and their extremities are delicately formed; peculiarities which they possess in common with the stag.

These men like the stags, will become scarcer as the century advances, in accordance with the operation "of the law" by which those members less useful to the well-being of the community, are expelled or reduced to a minimum.

The deer is smaller and less noble than the stag, but is nevertheless a graceful animal. The stag inhabits the Highlands, the deer the Lowlands. The former may represent the silly gentleman of the North, and the fallow deer the elegant but effete noblemen of the South of Europe, for whose possessions the advocates of democracy thirst; as the hounds do for the blood of the stag and deer.

The giraffe (*Camelopardalis giraffa*) so curiously spotted, is the tallest of quadrupeds, and is quite unique amongst living animals in form and habits. It resembles the deer tribe in some few points of character, and like them is not ferocious except at the season of love. Owing to the position of the eye, the giraffe can see almost as well behind as before: hence its quickness of sight, and as it is timid, readily betakes itself to flight, and is extremely difficult to pursue with success. Its horns are covered with skin, but nevertheless they can be used by it as powerful weapons of defence: the males especially, often indent each other's skulls with them.

We see a slight resemblance between this creature and the tall Nubian-Arab, who belongs to a mixed race, and unites two sets of qualities, as does the camelopard. The Nubian-Arabs are crafty, and more easily take alarm than tribes of pure Arab descent, but are usually less quarrelsome. When they do fight, they frequently use their head and feet like these animals.

We feel regret when a Nation, or curious genus of quadrupeds is ill-treated or destroyed; and we almost fear that both the

nationality above mentioned, and the giraffes, have suffered in consequence of civilized man.

The musk-deer (*Moschus moschiferus*) is the animal that yields the musk of commerce, which in its pure state is so much admired by Oriental nations, and when modified by other ingredients, still takes a place in the strongest and richest perfumes of London and Paris. The drug musk is extracted from its secreting pouch in the hinder part of the animal. It is said to have so powerful an odour when freshly obtained, that the hunters require to protect their mouths and nostrils by bandages, to prevent them from inhaling the vapour of the wet musk, which is apt to cause violent hæmorrhage from the nose or lungs.

The musk-deer is an innocent-looking animal, without horns, but has long canine teeth of very singular form in the upper jaws. It is a little smaller than the roebuck, and lives only in the mountainous regions of central Asia, where it wanders amongst eternal snow. It is covered with a hair-like fur, which stands erect from the skin in the attitude of defence against the cold.

In musk-deer we see a type of those fair nations, who occupy the Hindoo Couch and Boutan, which is believed by some ethnologists to be the ethnic-centre of the Indo-European race, from whence they have migrated to Western regions. In like manner the perfume musk, is diffused towards the West. The choicest perfumes from all parts of the globe, are concentrated in Western Europe, from whence they ascend to Heaven; typical of the character of the faith of this region of the world, which has culled the sweetest blossoms of Morality from the entire Earth.

Musk cannot be obtained without causing the death of the animal, and in like manner some nations and individuals, must die for the good of the greater number of Mankind. Musk typifies power, which in Great Britain to be *endured*, must be divided and dispersed: yet this very Diffusion contributes to the Glory of the World. Not so brightly as if it were reduced to a focus, which would be too intense a light to suit modern eyes. This is the reverse of many Oriental countries, where *centralization* prevails, and all power bends thereto. Spices and drugs must be in the strongest and least diluted form to please the appetites of natives of the East.

The common sloth or Ai (*Bradypus tridactylus*, Linn.) is amongst the most simply constructed of quadrupeds, and its intelligence is of a very inferior kind. It passes its life in dull but sluggish content. Its structure however is eminently adapted to its habits, and it moves with great facility among the trees in which it lives, and where it is quite at home; but on the ground

it is clumsy and awkward in its movements. It sleeps most of its time. It possesses immense muscular power, and its body is so flexible, that it can roll itself up into a ball, so as completely to conceal the head. In this habit it resembles some perching birds, and has other points of analogy with the class *Avis*.

Sloths are not entirely destitute of teeth, but as they have fewer than most quadrupeds, they cannot masticate their food, but merely bruise or break it. They are very tenacious of life, as is general with most animals of languid circulation and inactive habits.

The sloths show an analogy with men of the Bilious-lymphatic temperament, who usually require more sleep, and are more difficult to rouse than those of a more sanguine temperament. Sloths like a snug, warm covering over their powerful muscles. They are not easily killed by wounds. These peculiarities of constitution and disposition, are observable in several tribes, who inhabit the Basin of the Amazon.

The armadillo a creature confined to America, is remarkably protected by its extraordinary covering, which is peculiar to it and one or two animals of the Edentata. We are inclined to accept this class, as representative of *effete*, indolent natives, of the New and Old World, who have lost their *natural weapons*, and are reduced to defend themselves either by artificial restraints or defences; that so encompassed they may escape, or ward off the attacks of their stronger neighbours.

The six-banded armadillo (*Dasypus sexcinctus*) is a burrowing-animal of nocturnal habits. It is omnivorous, feeding on vegetables, young birds, reptiles, and the carcase of any creature within reach. It is by no means wanting in a certain kind of sagacity, which enables it to avoid danger. When roasted it is thought excellent for the table by the Spanish and Portuguese-Americans, who in like-manner consume the substance of the weak and nearly helpless aborigines. To avoid such a fate, they are glad to retire into the interior of their country; in which they would rather "bury themselves" than encounter their destroyers. But such a course is often vain, although the luxuriant forests may cast around them a protecting shade, which is a defence more complete, than the armour plates of the armadillo are, against the smaller beasts of prey.

The great ant-eater (*Mymechophaga jubata*) otherwise called "the ant-bear," from its peculiar, hugging propensities and rough fur, is a native of the forests of Brazil and other parts of South America. It assists in maintaining the balance between different orders of animals, by devouring multitudes of a class of creatures, which otherwise would commit alarming havoc, even in the luxuriant basin of the Amazon.

It digs holes in the ant's nest with its powerful claws, and inserts its long tongue, with which it collects the ants with amazing rapidity. Most parts of its body are almost impervious to the attacks of these insects.

In most countries, classes or individuals are found, whose principal office appears to be, to keep in check other divisions of the community which are especially injurious. In Brazil, the Cayopa Indians are useful to that country, although like the ant-eater unwilling to work except on their own account. They are also more "rough and bearish" in their manners than some tribes; and may give the traveller who intrudes incautiously into their dwellings, a somewhat savage reception.

The manis or pangolin (*Manis pendactyla*), is the representative of the ant-eater in India and Africa. It resembles a lizard in general outline, and its scales are also somewhat like those of a reptile. It has a habit, when attacked, of throwing itself on its side, and crushing any object within its reach between its head and tail. When coiled up in this manner, it is invulnerable by most animals of prey; it is even said to be capable of crushing the trunk of the elephant, or the paw of any wild beast, and its scales are said to be harder than any other organic substance.

The Santals or Bheels of India, are low tribes without any caste, and are compared by the superior classes with the reptiles on which they feed. These tribes are by no means contemptible enemies, and are valuable friends, for they may be induced on an occasion to turn their strength against our rebellious subjects of higher tribes, whom we may compare with the elephant and tiger. They are a somewhat excitable people, and require to be judiciously dealt with, for they are prone to resent attacks.

What was said of the scales of the pangolin by the early writers, is true of the disposition of the Bheel nation. GIVE THEM A BLOW WITH THE SWORD AND THEY WILL FLASH FIRE.

The Marsupialia or pouch-bearing animals, are eminently characteristic of Australia, and we are inclined to think this peculiar fauna typical of the character of the native human inhabitants.

In the dog-headed zebra-wolf (*Thylacinus cynocephalus*) we see a representative of the predacious, cruel, and bloodthirsty character of the late aborigines of Van Dieman's land; who were so nocturnal in their habits. The eyes are large, dark and full, and the expression sinister, heavy, uninteresting and savage in this animal and its prototype.

In the flying *Petaurus sciurus*, so pretty and delicate in form and colour, we see an approach to what is agreeable and lively

in more favoured races. Proving that Australia, although its general fauna has a gloomy character, yet has somewhat in common with more cheerful lands.

It is become the focus of the civilization of the Southern hemisphere, in harmony with which the fauna is undergoing a change.

The fur of this animal, which is likewise called the squirrel-opossum, is used by such of the blacks of Australia as see the necessity for a scanty clothing; which may prove that some modesty, small in degree though it be, is still left to them.

The kangaroo-rat (*Hyprymnus murinus*) a thieving, poking, rooting little animal, does much injury to the vegetable gardens of the European settlers. The natives of New South Wales have similar habits, and are like this animal of a mean, cowardly disposition.

The kangaroo belongs to that division of Marsupials, which contains the largest animals. Some species reach a great height, and are doubtless the largest land-quadrupeds known in Australia. They are not formidable unless when attacked, but they can with their powerful hind-toes, give severe, backward, ripping-scratches, which are capable of disembowelling the largest dog. The kangaroos represent the aboriginal Negrittos; and their back-strokes, those of the boomerang. It is the noblest quadruped in Australasia—see how erect it stands! how cleverly it leaps!—but its intelligence is of a low character.

The wombat (*Phascolomys wombat*) has fur, like that of a bear; but in outline it resembles the *Hyrax* or coney of Scripture and the badger; and like the latter it remains all day in its burrow. This is the only animal in Australia and the neighbouring islands, which has the faintest resemblance to the bear; but differs in belonging to the Marsupial class, and in being of a mild, harmless and noiseless disposition; for it hisses rather than growls when angry.

The blacks of Australia can but little resist British progress. Their attacks on persons and property are ill-organized, and benefit them little; and their best defence is a feeble but frantic struggle.

The porcupine ant-eater (*Echidna histrix*), is entirely destitute of teeth, but is covered with spines like the hedgehog; and like that animal can coil itself up into a ball, and show a front of sharp spines on every side, which defies the attacks of a ferocious dog or zebra-wolf. Its food consists of ants and small insects. Were it not for its shield of spines, this creature would be helpless against the attacks of its enemies; and the aboriginal population would be in a similar condition without their arms. It is infinitely inferior in size and strength to the

pangolin of India, or the ant-bear of Brazil; and its human prototype is inferior to the wild tribes of these countries. This shows how true the analogy is, between the less vigorous fauna and the human inhabitants of Australia.

The duck-bill (*Ornithorhynchus paradoxus*) is a sufficiently curious creature to excite the attention of the most common observer. It is one of the most important links in nature, connecting the quadruped and the bird; for it reminds us at once of the otter and the duck.

The Marsupials in their mode of propagation, *resemble* birds. Their young are expelled in a most rudimentary condition; and are afterwards developed in the pouch of the mother, which we may compare with the *bird's nest.* The Marsupials, whose young are not covered with a *placenta*, belong to the lowest division of Mammalia. Their predominance among the quadrupeds of Australia and its adjacent islands, is typical of the degraded human inhabitants of these countries. The little "duck-bill," is the lowest individual of the class of pouched animals, and its *shovel-bill*, reminds us of the apparently deformed lips, of the extreme type of the natives of Sydney.

Those who pursue and capture whales, if they benefit themselves also contribute greatly to the comfort of the world. Whales collect the riches of the Sea which would otherwise be greatly lost to man, but amassed in their bodies become a valuable material for his use. They have their analogy in such seafaring nations as the Scandinavians, who "suck of the abundance of the seas," and whose labours are so valuable to the rest of mankind. The Scandinavians furnish us with oil, to illuminate our dwellings and lubricate our machinery. They likewise greatly enlighten us by their inventions, and assist us by their applications.

These "sea monsters draw out the breast and give suck to their young ones," by which they show a great advance on the oviparous fish, which after they have spawned, leave their progeny to shift for themselves. Scandinavians are eminently distinguished for the strength of the parental tie.

The immense thickness of the whale's skin, renders it less sensitive to cold than other warm-blooded animals. In like manner these nations before mentioned, being often fat, are capable of withstanding great cold. Fat is a highly carbonized substance, which contributes as it is consumed, to maintain a high temperature on the surface of the body. Fat men do best in cold, and the lean and skinny, for the most part in hot weather, and the same is the case with animals in whom "the blubber" is thickest.

We are inclined to think the true fish typify the "Ichthyophagi" or Finnic ("Hyperborean") races, while the whales represent those nations like Scandinavians, who resemble them only in habits.

Whales are provided with apparatus specially adapted to enable them to descend into the greatest depths of the ocean; for their tough blubber-like skin, *only* increases in density and strength by enormous pressure, under which the shark or other true fishes, could not for a moment exist. Their blow-holes resemble in texture vulcanized Indian rubber, which gains in strength and solidity in proportion to the pressure exercised on it.

The Scandinavians only gather strength and greater powers of resistance as they are opposed; while nations differently constituted are crushed.

The whale respires pure air, and can only breathe on the top of the water. The Scandinavians are a frank, open people and hate to act beneath the surface, only breathing freely when they are "above board."

The fish-eating Finns were anciently confused with the Scandinavians, who were thus degraded to a level with them. The whales were formerly classed with the fish, but now they are elevated to a place amongst Mammals, and the Scandinavians to a position in the highest family of man.

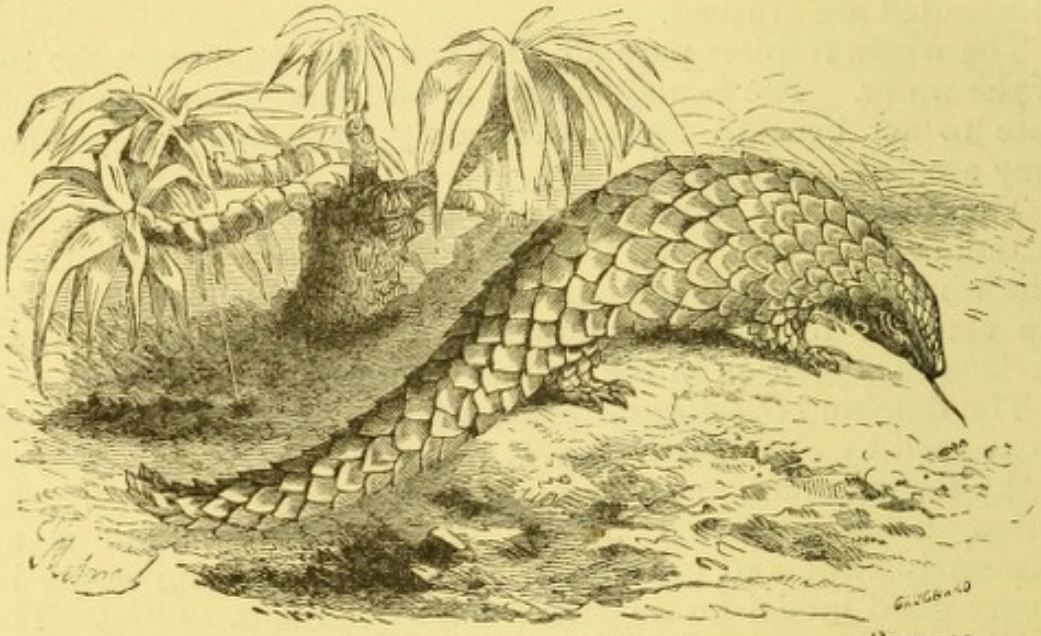
The dolphin (*Delphinus delphis*) a favourite with the poets, is mentioned by classic writers. It was supposed to have a sympathy for mankind, and was said to have been led captive by Arion, being attracted by his music. The dolphin is an extremely swift and graceful swimmer, and its form would be a very good model for a canoe intended for fast sailing. The dolphin follows ships for the sake of devouring the refuse. Its flesh was formerly reckoned very palatable, and is even now occasionally eaten.

It is pleasing to see them sport round a ship, leaping completely out of the water, and cut through the surging waves, surrounded perhaps by a wreath of foam, reflecting rainbow tints; their bodies bending at the same time, and displaying the greatest variety of contortions. They swim so rapidly, that notwithstanding their labyrinthine course, it is little effort to them to keep up with a fast sailing ship. Like the whale the dolphin is killed with the harpoon, which pierces its body and opens its veins. The agonized creature dives, carrying the weapon with it; but must soon rise to the surface to breathe. There it encounters its enemies, who wound it a second time. It struggles fearfully as its red blood tinges the waves.

The dolphin presents an analogy with the mariners of the

Mediterranean, who are the descendants of classical nations, some of whom repose upon the reputation gained for them in ancient times, which is not now justly maintained. This resembles in authority and value the fables related of the dolphin. We pronounce the names of localities in Greece, and ask "if their inhabitants are the descendants of heroes?"—"No!" Their glory is departed, and has not even left the hues on the horizon, with which poetry surrounds this animal's death; but whose beauty belongs to the Coryphene; an animal of a different class.

On a careful comparison of the Greece of Heroic and classic ages, with the Greece of modern times, we have been led to inquire, whether the glory of the Greece of ancient days, was influenced by *a small element* in the population, perhaps of



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foreign introduction, who were the columns of the state. When these props were destroyed, the temple of the nation's greatness became a ruin.

Unless we accept some similar hypothesis we cannot account for the decadence of that eminent country. Were the great men of our nation to be cut off by battle, pestilence or civil strife; if their sons lived, would they not be the representatives of their fathers?

The Greeks of the present day, like the dolphin, show great flexibility, and have no difficulty in following the track of our traders, and keeping up with them, for self-interest guides their course.

The porpoise (*Phocæna communis*) is a frequent visitor to the shores of Britain; and rolling and tumbling after its prey in a

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grotesque manner, drives away the smaller fish from the shores.

The primitive signification of *Nise*, the Norwegian name of this animal, is *goblin;* probably alluding to the terror it inspires in the shoals of herrings. It is wonderful our fishermen do not pursue them wherever found, as enemies to the success of their craft, as well as for the sake of the large amount of oil they contain.

The porpoise typifies those nations who poach on British fisheries, destroying multitudes of our finest fish, and who toss over the waves in the most impudent manner near the coast. Our fishermen and "coast guard," have at some periods not cared to pursue them, unless they approached very near to the land. This want of vigour in the protection of our fishing interests, sometimes excites the ridicule of foreign nations. "John Bull" does not get the credit of good-nature on these occasions; but his indulgence in allowing the typical French hogs (*porcs poissons*), to fish in his waters, is attributed to weakness. With the law on his side he can always legally capture the poaching fishers.

The grampus (*Phocæna orca*, Cuv.) of whose ferocity fables are related, is said to attack whales many times its size, and worry them in a cruel manner, until they in terror open their mouths, when the grampus darting on the whale's tongue, tears it out and devours it.

The grampus we consider typical of the Normans, who were more than a match for the Frankish Gauls and Bretons, illustrated by the hog-fish; and even took up their station on the soil of England—the body of the "bull-whale."

The Norman conquest by no means permanently *tore out our Tongue;* but it was *held* for some little time, until the "Norman grampus" had to hold its own.—This took place when the Norman-French, was replaced by the language of Racine and Molière.

The bottle-nosed whale (*Hyperoodon, Butzkopf*, Lacép.) which sometimes makes its appearance on the northern coasts, has a curious beak-like mouth, and is stouter, longer, and wider in the body than any of its class.

Dutch mariners are generally believed to have long bodies, short legs and noses which show a "progressive development" towards the Schiedam flask, if not in actual form, still in type; for grog loves to illustrate itself in this organ.

The Narwhal or sea-unicorn (*Monodon monoceros*, Linn.) is the prettiest of the whales, but has been accused of making attacks on the great Greenland species. This is not probably the case, for the animal having no teeth for biting purposes, it is difficult to understand how it could possibly prey on a living

whale. The curious spiral horn which it possesses, is its only developed tooth, but another exists in the jaw in a rudimentary state, which however in some cases assumes the form of a second horn. Its food consists of sea-blubbers, and other soft creatures, that require little mastication. It probably uses its horn as a weapon of defence, but rarely attacks other animals, although the older writers considered it ferocious.

The sea-unicorn typifies the pushing power of the northern nations, who have notwithstanding lost their former fierceness, and do not now attack others without provocation. Such are the Danes and Icelanders, who are the descendants of "the Sea Kings," and whose offspring in other lands, have so much weight and power in the present day. The single horn of this animal represents the proper position of the Scandinavian kingdoms ;—they should be ONE. The double horn illustrates their *abnormal* state of division.

The cachalot or spermaceti-whale (*Physeter macrocephalus*) only next in size to the rorqual amongst existing animals, yields some important articles of commerce. The principal of these are a rich oil which is separated into spermaceti or pure stearine and spermaceti-oil, and the curiously anomalous substance ambergris, found in the intestines as well as in other parts of the body. It is even sometimes found floating on the surface of the sea, at a distance from the whale. This creature swims with great swiftness, and is believed to live to an enormous age, probably far beyond that of any other animal.

Its food consists principally of cuttle-fish, which according to Mr. Beale's supposition, enters its open mouth as it reposes, being attracted by the white teeth. That its prey is obtained in some way where sight is not required is certain, from its often being found blind. Others are found with the lower jaw deformed, and yet are otherwise in as good condition as perfect animals. The teeth are not used for mastication, for the prey is swallowed whole.

The struggles of a wounded sperm-whale are often tremendous, and endanger the lives of boats' and ships' crews. A period of breathless anxiety passes after the whale is "struck," lest it should escape or injure the crew. It is first attacked with harpoons and ropes, and finally killed with long lances. But before the whale expires, it discharges its blood in great abundance, through its wounds and blow-holes.

The sperm-whale typifies some great corporation or public company, whose wealth sadly tempts the cupidity of the enterprising but unscrupulous. Like the whale it is usually far too large to be the prey of one spoiler, but may make many wealthy. Its enemies like those who pursue the sperm-whale,

represent many different classes in society. When they see a Joint Stock Company in a state suitable for attack, there is as great an excitement among them, as there is on board a ship in search of these animals, when a whale appears in sight.

When a whale is seen, boats are put off in search, manned by a swift oarsman; but often before it is reached the animal plunges into great depths, for instinct tells it to avoid the presence of man.

This conduct of the whale, reminds us of the first rebuff usually given to those, who would interfere without authority, in the affairs of a public company.

The boat's crew watch a long hour for the appearance of the whale on the surface of the water. It rises, and they start in pursuit. As they approach the vast animal, a sharp barbed harpoon attached to a long rope is thrown with great force into its back. It writhes in pain, and instantly descends, carrying with it the harpoon and the line attached. It remains a shorter time under the water than it had previously done, for it is much weakened by loss of blood.

The harpooning of the whale, represents the first opposition to its onward progress, which a public company receives from its enemies.

The whale is harpooned a second time and again descends.

This second stabbing process, may represent the board of enquiry into the conduct of the directors of the company; and the downward course of the whale may illustrate the falling state of the concern.

When the harpooned whale rises a third time, it is lanced; which is typical of the final decision of "the Board." The execution of this decision, is illustrated when the last struggle is over; which however does not take place, like the whale's death, without "a great struggle," when all concerned in the process, may be "sprinkled with dirt."

The final division of the carcase is done regularly and legally, like that of the affairs of a public company, by the supreme authority of the Court of Chancery. That body strips the company of all its property before they have done with it.

After the whalers have extracted from the whale every thing of value, they cast it *adrift.*

A sperm-whale may be again likened to a Friendly society, which has done much mischief to small capitalists.

This species mostly feeds on blubbers, mollusca and a few small fish, which attracted by its white teeth enter its mouth. They may represent the artisans and petty tradesmen, who are caught by the "bait" of good interest for their money, held out to them by the society.

The spermaceti in its crude state, typifies the capital which the company has made its own. That fluid consists of two principal ingredients; olein and stearine, which may illustrate, "present and deferred annuities;" while the ambergris, which some think has a putrid and stinking odour, is like the "burial fees" paid by the society.

The Greenland whale (*Balæna mysticetus*, Linn.) is the creature that yields whale-bone, and the greater quantity of the whale-oil of commerce. The gullet of this whale will scarcely admit a man's hand, and consequently its food must be of a very small size. It consists of minute mollusca, crustacea and medusæ, which float near the surface of the sea in amazing quantities. It collects these in its vast mouth, and closing it over them allows the water to escape through its plates of whale-bone, which retain all the animal matter, to be sucked down the whale's gullet as through a funnel.

The whale's greatest enemy is man, but it has also foes among the fishes of the northern seas, such as the arctic shark (*Scymnus borealis*), the thresher (*Carcharias vulpes*), which hits the whale powerful blows with its tail; the sword-fish (*Xiphias gladius*), and the saw-fish. Several species of birds also are quite happy to take a share in despoiling its carcase.

The whale's only means of preservation is in its power of retiring into the depths of the ocean, where the structure of its enemies would not allow them to follow it. It is a type of the British constitution, hundreds of years old as whales are supposed to be. It is a cumbrous, bulky corporation, and is certainly more easy to *attack* than to defend, except on the ground of its utility.

The threshers which attack the whale, may typify foreign enemies. The sword-fish which *stabs from beneath;* the "Radicals." The saw-fish those who attack it from the other side of the Atlantic, and only want the power to cut it in two.

In the numerous sharks which only follow the whale for what they can get, we see a resemblance to some of the allies, who would gladly see the British empire divided,—if they could benefit thereby.

If the British nation is only true to herself, she may like the whale retire into the recesses of her home, and be there indifferent to her numerous enemies.

The Greenland whale and several other species, are infested by parasitic barnacles (*Coronella diadema*), but these are apparently unheeded by it. These may represent the blemishes in our Political system which we must not however attribute to the CROWN.

The rorqual (*Balænoptera boops*, Flem.) the vastest of living creatures on the globe, of which we have knowledge, is swift, active and watchful compared with the Greenland whale. Its pursuit is so dangerous that the bulk of whalers do not attempt its capture ; but the Scandinavian fishermen of the north, the most enterprising in the world, do not hesitate to attack it.

The rorqual is less valuable in commerce than other species of whales. It is a type of institutions which are of comparatively limited importance such as the corporations of London and New York, which however tempt the envy or cupidity of legislators in both countries. The corporation of London was attacked in 1863 by an important " bill ;" but like the wounded rorqual it floundered, and calling on other corporations for aid, "broke its enemy's line" and escaped. It is probable that it will be allowed a long respite. The enemies of corporate bodies like those of whales are mostly the people of the North.

CHAPTER XIII.

THE CHEMICAL ELEMENTS TYPIFYING MAN.

THREE STATES OF MAN—MAN A TRINITY—THREE KINGDOMS OF NATURE—EMOTIONS CONNECTED WITH CORPOREAL ORGANS—FOUR ELEMENTS AND MODERN ELEMENTS — PHRENOLOGICAL FACULTIES — TEMPERAMENTS — OXYGEN — HYDROGEN — CARBON — NITROGEN — METALLOIDS — ALKALINE-EARTHS — IRON — LEAD — ZINC — COPPER — MERCURY — GOLD — SILVER — ANTIMONY — PLATINUM, AND ITS SATELLITES — ELEMENTS TYPICAL OF MAN'S ACTIONS AND CHARACTER — AMMONIA — NITRIC-ACID — SULPHUR — PHOSPHORUS — IODINE — BROMINE — FLUORINE — POTASSIUM — BARIUM — STRONTIUM — SULPHURIC-ACID — LIME — MAGNESIUM — ALUMINUM — GLUCINUM — THE PRECIOUS STONES.

MAN is a unit; but a trinity standing in one figure. His states are three; Living, Dead and in Resurrection.

Mind analyzes itself as well as what surrounds it, and naturally applies the same principles in considering both:—the method of analysis is similar. We believe in Man as an Unity, and in the World as an Unity; and that these "unities" act through different portions or divisions, specially allotted to various functions. These functions often, properly belong to the same element or part; yet great divisions exist. Thus if we admit Three Kingdoms in Nature; the *Inorganic*, the *Organic* and the *Moral*, so we subdivide these "Three" again into *elements;* remembering at the same time, that absolute isolation among the elements, analyzed and separated by modern chemistry, is as impossible, as the absolute separation of divisions, species and individuals, is in the Organic Kingdom. The same law applies to the individuals and functions comprised in, or under the influence of the Moral Kingdom.—All are connected and hang on each other.

These three grand divisions; "the Moral," "the Organic" and "the Inorganic," illustrate one another, fill many gaps, and form bright bridges, on which we can cross those dark clouds, which have for ages obscured the outlines and main principles, of the "System of Nature." We therefore use these great divisions, these Great Empires to illustrate each other.

The TRIAD-UNITY Man, with his Organic section capable of decay; with his animal life, and with his spiritual life,—"his Body, Soul and Spirit" illustrate each other; they are all analogous to the great Empires in Nature; unities that may be analyzed, but cannot be wholly divided.

The soul of man is the union of his *spirit and his* BODY, and expires at his death, which is but *disunion:* it is during life a type of bestial or Organic life.

After death man consists of but *two* sections; the spiritual which is flown, and the Organic, which by dissolution becomes *In*organic, and can never live again; although the Man may. These two last-named divisions, may again be contrasted with the "Organic" and "Inorganic Empires of Nature."

Man's body is a *Unity*, and yet we divide it into Different parts or Organs. While we admit the apparent occurrence of "local disease," yet the body smarts from head to foot at the least touch on the most distant extremities, of any disorganizing influence. The more Man is in health, the more is he cognizant of this TOTALITY.

The ancients allotted different classes of mental emotions to different parts of the corporeal system. Thus the bowels were the seat of the Domestic affections and kindly feelings, the head of the Intellectual faculties, and the heart of the Moral faculties and propensities. The spleen presided over satire and vindictiveness, while the liver was devoted to melancholy, and the gall influenced that bitterness for which there was no cure.

But now the system of man is found to be representative. His head is not merely in the position of ruler, commander and governor of his frame, but it is the focus of his light, and presides over *all* his emotions, sensations, observations, and every function exercised by the smallest organ of his body. It is his "godhead" as contrasted with his corporeal trunk and extremities; which comprehend but another view of his Tri-unity.

The brain is the great centre of life and function, every operation being performed by it, through the agency of the more local organs which "serve mere engines to the ruling mind."

The idea of the ancients had a considerable measure of truth. The connexion between the exercise of different emotions and that of particular parts of the body, is assuredly to be traced in a close and corresponding manner.

Man consists of three great unities, all exercising a variety of faculties or functions, which *united* make the Man. His body consists of many parts or organs. His mind which we shall at present call his "Animal life," acts through different corporeal organs which we discover by comparative observation:

—this is his Soul. The *Spirit* is the type of *all*, and acts through all; but can exist alone.

The Spirit of Man, the offspring or emanation from GOD, is not the result of *Creation*, but is Immortal, and its presence in individuals is dependent on the will of the Creator. The spirit is the seed of man, which proceeding from Man and sown where he decayed, springs up "A NEW MAN." This is what is usually termed "resurrection," which is but the completing or perfecting of man for his start on a future life. The seed of a plant, in proportion as the germ springs from it, decays; the Elements of its growth being derived from the Decaying matter of the seed, the earth and the air: therefore it dies, as every object must, to rise higher.

The soil of earth may be here taken, as the original framework into which life is placed. The chemical processes of decay and sustenance, illustrate further growth, after the start given at first creation. We may venture on these remarks, from their being in harmony with Resurrection, which is probably a process similar to that of creation.

It is evident that beings who have once lived; must be in their second or renewed life (even if we call it "a new or *Re-creation*"), in a very different position, from those born for the first time. Those born for the first and second time may be contrasted with each other and with Primeval-Creation.

Vitality is the Offspring of God. It was bestowed on Adam; but given also in a different manner, in a different degree and in a different form to all organisms. Therefore all life "is the Offspring of GOD;" but that of the lower Animals and plants, does not possess that *immortal individuality* exclusively reserved for Moral Beings. Not even perhaps a specific immortality, still less a racial immortality; but a generic, classic and typical immortality. This last is the most inclusive and certain of all resemblances between the New and Old Creation; our lives in this world being eminently illustrative of the future. An analogy which we believe will be carried out, through and between all surrounding objects in both Worlds. But we must bear in mind that many things that are allegorical and figurative in this world, will be real and substantial in "the next," and the exact reverse, for many things that are real in this world, will be typical and figurative in the Next.

Creation was progressive! The age *characteristic* of plants, was succeeded by the age *characteristic* of animals, each rising higher than the preceding; each dying away, till man appeared higher than ALL; who must expire to "Put on Immortality."

Man's fall was typified from the earliest creation of matter, from the time when the "Elements began to move." Their

disintegration to take part in higher combinations, typified his fall and progress. The creation of the lowest plants and animals, constructed of these elements and their continued existence, involved disintegration:—THE LOWER FORMS MUST FEED THE HIGHER. The lowest plants and the lowest animals died to feed the higher; the highest plants and the highest animals died to supply food and satisfy the wants of man. His body dies that his spirit may attain a higher rank; it decays, that out of its ashes may spring a man of a higher order. Thus death began as soon as life. It was as necessary to the maintenance of life as of progress. Lower races pass away that higher may succeed, even of Man's imperial family.

The different organs in the trunk, typify these faculties of the mind or portions of the brain, through which the mind can alone act, and by which we in general understand what the phrenologists mean by the term "Faculties."

The Mind of Man *is his Spirit acting through his phrenological faculties*, by which he can alone receive and communicate impressions during his present life. His life hereafter, being that of the same Mind, must preserve the same class of functions; during death in a dormant state, and in resurrection in a state of renewed and increased activity.

To imagine Man without a body is difficult; and it is certain that he would then be unable to act as a perfect being.

Inorganic chemistry, the first or most primitive branch of knowledge, is the earliest history of the Earth, the foundation of physical science, that gives us a faint idea of the formation of the primitive rocks, which form the basis of the later strata.

There was not a time when there was no *rule*, and therefore Moral law must have been the parent of physical law.

We may for a moment give the *physical* the first place; but the Moral is the earliest in date and the highest in reality. Such was the FIAT of the Almighty;—The Creator of the Universe.

The tendency of man's mind as he progressed in civilization, was to inquire into the "first principles" and "elements of things;" but he has hitherto been a child, and "children" can grasp but very little. He stumbled on "Four Elements," which represented to his mind the composition of the earth. This division was a step towards System in matter, and any system is better than none; for its very defects, its very rents, are holes which call for Mental exertion to patch. In time the "old garment" wears out, but the skill acquired in "patching it," and the old materials, assist in constructing a new one. This false system, this net of rags has kept together pieces of gold, which the philosophers of old time, have hoarded for the "heirs of science."

In like manner those who studied man from the days of Galen to our time, separated his system into parts or temperaments, which were frequently divided into FOUR. Thus there were the Bilious or melancholy, the Sanguine or Choleric, the Phlegmatic, Lymphatic or fleshy, and the Nervous or Mental. That these divisions do exist is certain, but they are only rough divisions, such as are used when we say that the world "is divisible into Air, Earth, Fire, and Water." The FOUR TEMPERAMENTS of Man, are all comprised and included in the organization of the Faculties of his Mind. They indicate his Temperament *exactly;* and, with far less precision—it exhibits the proportion in which he possesses all the faculties common to Man.

So the division of the World into "Four Elements" is but a rough and primitive method of treating a vast subject. The modern elementary system is much more precise in its analysis. The old arrangement divided substances into solids, fluids, gases and forces; or what we see and of what we are cognizant. Modern science would consider these "forces" not entitled to a separate class, but as the result of the action and functions of elements.

Physiologists have likewise ceased to reckon one of their Temperaments. Thus we have now but *three*, which answer to the solid, the fluid and the gaseous amongst bodies. They are classed as the MOTIVE or Muscular, the most solid; the SANGUINE or VITAL, the most fluid; and the NERVOUS or MENTAL, the most ethereal, elastic and excitable.*

We propose to show the analogy existing between the elements of modern chemistry, and the Faculties of Mind analyzed by Phrenology.† The elements which chemistry recognizes,

* Fowler.

† As an exact analysis of the "PHRENOLOGICAL ORGANS" is possessed by few persons who are even acquainted with the outlines of the science, it may be well for the sake of the more perfect comprehension of the analogy which we have drawn, to give a short sketch of what the author and most phrenologists understand by the use of the following terms, some of which have undergone some slight change in signification.

The first we shall speak of are Intellectual Faculties.

INDIVIDUALITY observes facts, names objects, treats subjects in reference to their details, and is *the* pre-eminently "Observing Faculty," though one of many.

FORM, notices the configuration of objects.

SIZE observes the proportion of objects.

WEIGHT notices the gravity of objects, and greatly controls the touch.

COLOUR observes tints.

LANGUAGE gives facility in expression, or the repetition of words.

NUMBER is the principal faculty which assists in numerical calculation.

LOCALITY notices the position and relation of objects.

ORDER assists in arrangement.

TUNE appreciates the qualities of sound.

TIME notices the lapse of time, as between sounds.

EVENTUALITY notices the connexion between facts; it is the chronicler among the faculties of the mind.

illustrate the primitive faculties of mind, and are sometimes entitled to be classed in a diverse manner. They are both basic and active; the grammarians would say, "are both objects and agents."

The present state of our knowledge does not admit of our finding elements and phrenological faculties which correspond in every case. Some clearly represent one another, while a few, perhaps from our imperfect knowledge do not show so close a resemblance.

The Non-Metallic elements generally, are types of the Observing faculties, of which the most important is Oxygen. It stands first as "the keystone" of all, taking the same place amongst them, that Individuality does among the observing faculties. Oxygen is the great stimulant, as well as the great destroyer of life. Individuality is the great sustainer and quick-

CAUSALITY inquires *why*, and deduces *the cause* from the Effect.

COMPARISON compares, analyzes and assists CAUSALITY in the reasoning process.

CONGRUITY (*wrongly called* "Mirthfulness" and "Wit") is the faculty which notices the harmony between subjects and objects; consequently greatly contributes to wit, which is so closely connected with the strain of harmony.

ALIMENTIVENESS discriminates the qualities of food.

We will secondly speak of the Domestic Propensities.

PHILOPROGENITIVENESS or PARENTIVENESS, is the faculty which presides over the relation between parents and children, a sentiment answering to it is the soul of the Paternal government in Nature.

AMATIVENESS relates to what is sexual, to the entire class of sympathies between the sexes.

ATTACHMENT or ADHESIVENESS, is the organ which has most to do with friendship.

CONCENTRATIVENESS is connected with the power of reducing things to a centre, either with relation to locality or study. We think with Combe that "Inhabitiveness" is but CONCENTRATIVENESS exercised in connexion with places.

We will thirdly speak of the Selfish Propensities.

DESTRUCTIVENESS is the propensity to destroy, but in human character it is frequently shown in acrimony, satire and the love of reform.

COMBATIVENESS is the opposing faculty; it knocks down and DESTRUCTIVENESS stabs; but Courage and fortitude greatly depend on this first-named faculty.

FIRMNESS is the stable and controlling faculty which directs the other emotions of the mind.

SELF-ESTEEM is connected with the opinion of self, as opposed to LOVE OF APPLAUSE, or Approbation, which causes Man to value the opinion of his fellows.

CAUTIOUSNESS is opposed to COMBATIVENESS, by causing deliberation in presence of danger. It is the conservative faculty.

ACQUISITIVENESS occasions the desire for property as such; but ACQUISITIVENESS only grasps; CAUTIOUSNESS is required to retain.

SECRETIVENESS is the reserved, exclusive faculty which while it hides, perceives what is Hidden.

We will fourthly speak of the Semi-intellectual Sentiments.

CONSTRUCTIVENESS is the building, planning faculty, necessary to the architect, mechanician and artist; Human and Animal.

IMITATION is the copying, sympathizing faculty, which gives imitative power to man's mind, hand and tongue.

IDEALITY is connected with the love of the beautiful in Nature and Art, and with Design; Idea or conception.

We will fifthly speak of the Moral Faculties.

BENEVOLENCE is the human—the philanthropical faculty.

ener of the other observing powers; yet it may force them beyond their strength by too great stimulus, and so destroy their tone and function, and thus induce mental disease.

Hydrogen is the great former of liquids, few being without it amongst compound substances. It is a type of Language which causes our ideas *to flow*. The "observing faculties" as a whole, are more agents than rulers, they are not bases in general, but the means of using them. A few, such as Eventuality, have a basic action. This faculty is the great storehouse of the Mind, it is the fuel which supports Man's most brilliant thoughts; it is the great connecter between his Reasoning and Observing powers. Its position is somewhat similar to Carbon, which is not so active in itself as some of the other elements, but forms the basis of the greater portion of the combustion on the Globe.

HOPE is the sanguine, aspiring, self-sustained faculty.

FAITH (wrongly called "Marvellousness" or "Wonder"), is the externally sustained faculty, as opposed to Hope, whose stimulating power proceeds from within. It is doubtless however connected with superstitions, as far as they relate to the unseen Spiritual World.

VENERATION is the faculty which leads man to respect higher powers and established usages and customs.

The faculties first analyzed by the Fowlers and the American school of Phrenologists, and considered by them *Primary Faculties*, the author believes to be *Semi-Faculties* or those which proceed from the union of Two PRIMARY FACULTIES. After considering the subject and comparing some hundred heads during many years he believes these organs to proceed from the approximation of two Primary faculties and to be indistinctly visible in a large proportion of individuals to such a degree as not to entitle them to be considered the corporeal organs of faculties common to Man. The author would therefore not yet give them a separate classification; but the subject cannot be yet fully decided.

"AGREEABLENESS"—considered by Fowler to be the faculty which promotes success in society, is probably the result of an approximation, between the organs of CONGRUITY and IMITATION.

"HUMAN NATURE" discerns the characters of men, and contributes to the management of men. It is the result of an approximation between COMPARISON and BENEVOLENCE.

"SUBLIMITY" which is believed to differ from IDEALITY by appreciating the grand, rather than the beautiful in Nature and Art, is the result of an approximation between the faculties of IDEALITY and DESTRUCTIVENESS.

"VITATIVENESS"—defined as occasioning an unwillingness to die, which varies in individuals, is located between COMBATIVENESS and AMATIVENESS.

The author believes it should be rightly included in the faculty of COMBATIVENESS—which resists death, as well as all things which oppose it, in opposition to DESTRUCTIVENESS. When "*Vitativeness*" is wanting it shows COMBATIVENESS to be deficient, so far as its opposition to DESTRUCTIVENESS goes.

"UNION FOR LIFE" is an organ which connects AMATIVENESS and ATTACHMENT; it unites the qualities of these two faculties to a great extent. It is also situated near where "Vitativeness" is supposed to be located, which we think significant of the desire for life, which accompanies the wish to be united to an individual of the opposite sex.

We may as well remark that all the PRIMARY faculties are common to Man; but the character of individuals is discoverable by a knowledge of the COMBINATIONS that exist in a man; for a faculty can never be isolated however much we may attempt it.

It is sometimes said that there are "good and bad bumps;" this is quite an error. All the faculties are equally GOOD; but some are higher in standing than others.

Carbon as the basis of the most permanent ink in use, conveys to later times the chronicles of the past, and is in this sense a type of Eventuality the Historical Faculty, which in the mind of Man is the medium of the record of events.

The Metallic elements unite greatly with the Non-Metallic, as the propensities combine with the Observing Powers, forming in union, useful adjuncts to each other. The three Metalliods, Potassium, Sodium and Lithium are types of the faculties Causality, Comparison and Congruity. They act powerfully on the Non-Metallic bodies; as the Reasoning faculties do, on their Observing servants.

The elements contained in "the alkaline earths" such as Barium, Strontium and Magnesium, which occupy an intermediate place between the alkaline Metals and the "basis of the earths;" show some analogy to the position of the Semi-Intellectual faculties of the Mind; as it were half way between the Propensities and the Intellect.

The Moral faculties are entitled to the highest place, they are the gems that ornament the man, that are above rubies in price or the precious emerald and the topaz;* analogous to which are the elements contained in these stones. Embedded in an earthy matrix, they are like the Moral faculties which reside in "the clay of man." Aluminum is contained in the ruby and sapphire, Glucinum in the emerald and beryl, and Zirconium in the jacinth of Ceylon.

The elements and their combinations, display some analogy with the Faculties of the Mind and their mode of action. Chemical analysis shows most irregular results. Thus some combinations of substances are wholesome as food, while others, which contain the same Elements in different degrees, are virulent poisons.

The characters of men consist of combinations of faculties, which are *good* or *bad* according to their proportions. "But even the worst may be rightly used, and even the best may be abused." If the elements illustrate the primitive phrenological organs, so do the Combinations of these elements, the various acts and qualities which our Minds manifest in daily life, and which are so various in their effects according to time and place.

The true Metals, illustrate the Propensities among the faculties of the Mind. Iron the most important has long been considered a type of firmness from its hard and enduring qualities.

A "leaden-countenance" is the acknowledged accompaniment of a heavy, tasteless and gloomy disposition, too low-spirited for much exertion. This proceeds from a predominance

* Job xxviii. 18.

of the faculty of Cautiousness in the mind; which keeps the individual in too great doubt to act with decision.

Zinc is sensitive to a lower degree of heat than most metals. A relatively moderate temperature is sufficient to render this brittle substance malleable, and a somewhat greater heat may cause an explosion. It is a type of the Love of Applause among the faculties, which contributes to sensitiveness, and when paramount in an individual, may render him highly susceptible of the influence of the "hot-tempered."

Copper has an unpleasant smell unless it is absolutely pure; and is of a colour approaching that of gold; but is of far less value. It is the principal ingredient in brass, the acknowledged emblem of assurance; which in man chiefly proceeds from large Self-esteem.

Mercury or quicksilver is a metal difficult to grasp or retain, and is exceedingly subtle in its action. It was appropriated by the ancients to the god of commerce and thieves, whose callings require craft. It is the most artful of the metals, and assists in applying others; escaping in a cunning manner when it finds its situation too hot. It is therefore a just emblem of the organ of Secretiveness.

Gold stands as a type or representative of property in many countries, and exercises most the organ of Acquisitiveness. The possession of gold like that of this faculty, excites the desire to increase wealth.

Silver is only less sought after than gold. We consider it a type of amativeness; one of the most important and ruling of the propensities. Its lustre is pure like that of the moon on which "lovers wait." But Acquisitiveness sometimes predominates over Amativeness, and cupidity may supplant "Cupid."

The action of Antimony is similar to that of Combativeness; it removes obstructions in man; throwing up and down with great violence. The ancients called it "antimonk." It seldom destroys life so rapidly as Arsenic, but reduces the system. Antimony knocks down, but Arsenic is only satisfied when it entirely eradicates life: it is a type of the organ of Destructiveness.

The faculty in man, which gives to the action of every other increased strength and intensity, is Concentrativeness. It reduces the operations of the Mind for the time, to a small compass.

Platinum is one of the heaviest of substances and imparts its great gravity to those metals with which it is combined. It is the standard against which great degrees of heat are measured, or delicate variations in weight or bulk.

Tin is a common metal with a lustre like silver, which it re-

tains for a considerable time. The tenacity with which it holds Oxygen, may be compared with the affection of a devoted friend. In its highest degree of oxidization tin is an ingredient in enamel. When melted it adheres with tenacity to iron or copper, and is one of the principal ingredients in "solder" which binds metals together. Its action is similar to that of Adhesiveness or friendship, which unites man to his fellow. Friendship rightly applied, is an ornament to society: it is the great enameller and polisher in domestic life, and gives it not merely a temporary Lustre, but a permanent Beauty.

Palladium, Iridum, Rhodium and Osmium are like children of one family, being found together, and lying in the same *bed*. Platinum is their protecting-parent; but some of them are difficult children to deal with, for Osmium is the hardest of the metals. Such a group of metals show analogy to a human family, the object of the exercise of Philoprogenitiveness.

Some elements adhere together with great devotion, and are apparently united for life, only to be separated by the divorcing chemist. Such are Cobalt and Nickel which in ages past were *wedded*, and still cling together until torn away by furnace-heats; or acids and alkalis, over which they have no control. The friendship of Zinc for Cadmium is also of a devoted character. They have been called "twin-brothers," as their ores are often united.

Having reviewed the primitive elements as illustrating the elementary faculties of the Mind of man; let us consider how they are typical of his actions and character.

The Thirteen Non-metallic Elements; Oxygen, Hydrogen, Nitrogen, Carbon, Sulphur, Selenium, Phosphorus, Chlorine, Iodine, Bromine, Fluorine, Boron and Silicon, form the most important class. Sulphur that destructive substance, may well typify amazing power either for good or evil. It combines with oxygen in two important proportions, and forms the well-known sulphuric and sulphurous acids. The first which is highly oxidized, is the most powerful solvent known and typifies a divine-messenger. The second, inspired by a lower degree of invigorating oxygen, has a more decided odour of sulphur. It has much less power as an acid, but is fatal to animal and vegetable life. It is a type of a "wicked angel," for it resembles power in evil hands. Yet "good may be brought out of evil," and in like-manner this sulphurous acid will whiten and purify what is polluted, and render it wholesome and fit for use.

Oxygen is a great restorer, as well as a great destroyer; it reminds us of the "attributes of the Deity," who supports all

things, but who cannot endure impurity or imperfection. Carbon requires oxygen for its combustion, otherwise it cannot diffuse a genial warmth. Human energy unless under Divine inspiration, can accomplish little.

Hydrogen—one of the great illuminators among the elements, is the principal ingredient in water ;—a combination of this gas and the life-restoring oxygen. A mixture of these gases is highly explosive, and may destroy those who incautiously meddle with them :—such are the "Korah, Dathan and Abiram" among scientific men.—Those who are more reverent in their pursuit of science, escape.

The heat produced by the combustion of pure oxygen and hydrogen, is far greater than any known. It is a type of the "fire of God" proceeding from earth ; as the electric light is a type of the "fire from heaven."

Nitrogen was formerly termed "azote," being supposed to be destructive to animal life. It certainly cannot support respiration, but it is with carbon the principal ingredient in the nutrition of plants and animals. The deadly cyanogen, the basis of hydrocyanic-acid, is a compound of those two elements. Which indicates that what is most necessary when "rightly used," to the support of life ; is when "abused," the most fatal to it. Nitrogen is more unstable in its combinations than oxygen and is more characteristic of Organic-compounds.

Nitrogen—the chief constituent of most living-organisms, is a type of the facts derived from their study ; which contributes to nourish man's mind. Carbon and calcium, alike illustrate the teaching man derives from the study of the animal kingdom. These remarks are not confined in their application to the professed students of science ; for the observation of natural objects is *universal* in man, who as long as he lives is influenced by them.

Ammonia, one of the most remarkable substances in Nature, is a gas composed of hydrogen and nitrogen. It resembles an element in many of its properties, but is at the same time a powerful alkali, corrosive to organic substances. Although so pernicious to animal life, the salts of ammonia are highly nutritious to plants. They are extremely volatile, and can make themselves invisible in a moment. Their presence can be felt when it cannot be seen. They are like the ghosts of those that are dead ; as they proceed from dead matter.

Nitric acid although not quite equal in strength, is as corrosive as sulphuric, oxidizing with facility either organic or mineral bodies. It forces the common metals to combine with oxygen, reducing them to powders or pastes, or entirely dissolving them, and only the "noblest metals" remain intact.

Strong acids like strong alkalis, destroy organic life; but when combined they form salts, which are in many cases necessary to its support.

Acids have sometimes very terrestrial functions. They long wander through neutral ground, where they find no rest; no kind, fair alkali, willing to unite her destiny with theirs. They at length reach her; she may be black as smoke from impurity; she may be white as snow from refinement. The marriage may take place as soon as they meet; it may be a silent process, accompanied by little heat on either side, with little more than a change of name and appearance, or it may be a formidable operation, accompanied by great froth or effervescence. But when the excitement of so important a change is over, they settle into a useful family "of salts." They fulfil their destiny like good people, and perhaps serve to fertilize the next crop.

Sulphur is that yellow element, thought to be characteristic of the "Infernal regions;" and it is surely brought from volcanoes, which the ancients believed to be "the mouths of hell."

Sulphur is easily melted, and readily adapts itself to any form. It is therefore much in request for taking casts and for making those indispensable articles, detonating matches.

In one case a female character well illustrated this element. Her complexion had a yellow cast. She was a great match-maker, but her "matches" were mostly lucifers,—her "marriages were not made in Heaven." Explosions followed the ceremony and brilliant flashes of temper which might be compared with the light on a phosphorus match. Although "touchy" herself, she appeared to enjoy these squabbles; but at the flame of their wrath she sometimes "burnt her fingers."

Phosphorus is more irritable and easily inflamed than sulphur, and bursts into a blaze with a slight amount of heat or pressure. Its combination with oxygen is generally accompanied by an explosion, but it may begin in a smouldering fume, which has an odour worse than garlic. Phosphorus is injured by exposure to the light, and assumes a darker colour.

The human prototype of phosphorus, has a more violent temper than "the flowers of sulphur;" and not to be behind her in love of mischief, takes a share in the manufacture "of lucifer matches." He is not to be trifled with, for his dull "fume" may end in a blaze. He should be kept in the shade, for exposure in a conspicuous place, would not only destroy his purity, but the little beauty he possesses.

Iodine—another element contained in the sea, is one of the most corrosive and powerful substances in nature, but of comparative rarity. It rots most organic substances, staining them as darkly as chlorine bleaches them white. The salts of Iodine,

particularly the iodide of silver, have played a most important part in those pictures which are the wonder of the age.

Bromine so named from its bad smell, is with the exception of chlorine, the most irritating and suffocating of the elementary bodies. Like iodine and chlorine, it takes an important position amongst the photographer's chemicals. The bromide of silver, being more affected by tints of green than the other sensitive salts of this metal, is much used in landscape photography.

Bromine is a type of those "Elves" that were believed to "dance on the green;" that were "*in bad odour*," but yet were supposed to give a charm to the woodlands.

Fluorine, is the most acrid, irritating and penetrating substance known ; dissolving every mineral that contains silica, or any other "earth," and attacking every metal. Almost the only substance not corroded by it, is fluor-spar, already so saturated with it that it can hold no more. Fluorine is the emblem of an all-pervading influence like that of the Deity, all being destroyed by Him who do not accept HIM as a RULER. Like Fluorine He is invisible, defying analysis, but is known by His power.

Fluorine and its hydrogen acid, cut glass, and reduce the hardest rocks to a solution or a gas, melting them into "smoke," as do created things at the command of THE ALMIGHTY.

The division of the elements into "solids," "fluids" and "gases" is false and superficial, for fluorine dissolves the hardest flint into gas, and in contact with water it falls into powder or solution, when saturated with hydro-fluoric acid.

Boron and carbon are somewhat alike in properties ; but boron is perhaps a nearer ally of that abundant element Silicon, for it has an intense affinity for oxygen.

God did not intend that "Man should dwell alone," neither did He intend that these elements should remain separate and divided. They are most difficult to isolate from their oxides, which the young chemist finds, in his desire to flirt with pure elements. He may succeed by a long and complicated divorce ; but their disunion is only for a time. Whenever they are at liberty, they fly to each other with a flash or an explosion. This reaches its utmost extent in the affection those "three graces" of the metallic world, potassium, sodium and lithium, have for the polygamous oxygen, which combines with them to produce a race of salts.

Potassium is no ordinary individual to deal with in the elementary family, and is a powerful aggressor on oxygen, wherever found. It resembles a woman who having conceived a passion for a man, is led to disturb his married life, and is

the occasion of his wife's death by consumption. In like manner when a fragment of potassium is thrown on water, it dissolves the union between the oxygen and hydrogen, and combines itself with the former. In human society such a state of things occasions a great scandal; and the chemical change described, is likewise accompanied by "a flame" and "a report."

Barium is the most dense of the "Alkaline Earths," as well as the most poisonous; its salts in particular are corrosive and pernicious to animal life. They are truly heavy on the stomach, occasioning if taken in quantity great disorders, and death, the heaviest of calamities.

Strontium greatly resembles barium, but its salts have not the poisonous qualities of the preparations of the latter, that are soluble in water. Two corrosive substances when they meet, often form a salt comparatively inert, thus oxalic acid and lime in combination may be taken into the stomach without danger, while either taken singly in the same quantity, would cause death.

Sulphuric acid and baryta, present an illustration of the same rule. The sulphate of baryta is not poisonous, because insoluble in water. Good is proverbially "brought out of evil," and in human society it is often effected by bad *influences*, whose venom finds its antidote in another's fang.

The various salts of strontia give to flame a splendid red-colour; while the soluble salts of baryta communicate a brilliant yellow, and those of lithium a fine red of a different tint. Almost every other element, gives to colourless flame a peculiar tint, by which the elements can be traced in nearly infinitesimal quantities. "Spectrum-analysis," one of the most important processes in use, has led to these results. It is made with the aid of the prism, that Triad-Unity, whose antitype presides over the Universe, yet admits us into its secrets, and whose very cipher "the spectroscope," added to the chemist's tools, multiplies them tenfold.

Calcium is the basis of lime, of which it is an oxide. Lime is thus a compound, which in turn forms other compounds with various acids, and so the world is filled with its salts. Animals and plants cannot exist without it, if we except the very lowest of both kingdoms.

Lime is the alkaline earth of our bodies, being the stony-matter of our bones, that which gives to our solid-parts their hardness and substantiality. Lime is also the great cement in building those structures in the inorganic World under which we reside, and which assists in forming as it were the skeleton of our wants; for our frames like our houses depend on lime. The furniture and fittings of our dwellings call in the aid of a great variety of elements, before they can be fit for the habita-

tion of man, and in like manner his skeleton must be covered and furnished with much more than mere lime, phosphoric acid and gelatine, before it can be a fit temple for his Spirit.

Magnesium, calcium and strontium are metals which resemble silver in lustre; but as they crumble to powder when water touches them, they have none of the enduring qualities of that material.

They are types of those individuals, whose virtue, notwithstanding their shining appearance, cannot bear the smallest test, or the most ordinary uses.

Magnesium is a weaker base than calcium and its oxide—lime, is much less caustic; but not having so powerful an affinity for the carbonic acid of the air, is avoided by the farmer. When he manures his soil he rejects lime contaminated with magnesia, which does not at once destroy the organic-substances which the farmer wishes to get rid of; but remains long a rotting-canker in the soil, affecting the weeds and crops alike. The sole cure for this is the application to the land of a strong mineral-acid, which dissolves, and renders soluble the caustic-alkali. These magnesium-limestones, are types of the bad farmer, who possesses but a moderate share of active-energy; yet who is "a bitter-opponent" of agricultural progress. The sour-tempered but vigorous Agent, can alone deal with him.

The alkaline-metals are of an inferior order and less specific gravity than the metals in common use. They are more lightly regarded than the "nobler metals," in which density reaches its utmost extent.—"Gravity inspires respect."

Aluminum is the most important ingredient of the true-earths, being the basis of clay, and with lime, silica and iron, the most common of the elements, solid at ordinary temperatures. The alkaline-metal aluminum, so fashionable for ornaments, is of a lustre between zinc and silver. It retains its colour much longer than those metals, but from its softness and other defects, is not nearly so applicable to the wants of life as silver.

Aluminum is one of the principal ingredients in *bricks* so much used in building; which have been long held to represent good-natured fellows whose popularity is increased by being on a metallic basis. They are rough sons of clay at best and their wealth, is often difficult to extract from them;—like aluminum from its earthy source.

Glucinum is the base of the beryl, the emerald and the aquamarine, which in general have little lustre unless cut and polished. The salts of glucina, the oxide of this metal, are soluble in water and have a sweet taste.

Glucina and its compounds, remind us of one whose associations have rendered him rather too refined and sickly in his tastes, but who possesses considerable vigour of character, which developed in after life, enable him when cut by adversity and polished by prosperity, to produce in literature or art, that which sparkles in a dazzling manner, and causes him to be pronounced "a Gem of the First Water."

Precious stones have always occupied a most important place among the valuables of a civilized nation, representing great worth in small bulk; and an enduring preciousness exceeding that of gold. They are eminently types of man and his life, which is of so priceless a character. Men have been in all ages compared with precious stones, which have different degress of merit, purity and value. Thus diamonds have many degrees of "water" and lustre, as well as of size and shape. Other precious stones, have different measures for accurately indicating their price. They are types of nations as well as of individuals.

The operation of cutting silicious stones is a difficult and tedious one. In England it is performed by the aid of diamond-dust, with which the stones are roughly cut into the desired form, and are then ground down with emery, according to the hardness of the stone, on wheels of wood, copper or steel. The diamond can be cut and polished *only by itself*, and with Incredible labour.

It is typical of the Teutonic and British races, who are when uncultivated, "rough diamonds." They need a great deal of hard polishing; not by other and softer nations, for that would be ineffectual—*but by each other.* French, Germans, Swedes, Italians, Spaniards and Danes, possess many of the qualities of the "true diamond," but in very different degrees. The choice and cultivated inhabitants of Britain, "that gem set in the silver sea" are "of the first water," and sparkle like brilliants.

The lower classes are still "Diamonds," but are often rough and unsightly; and to the ignorant eye inferior to the polished populations of more Southern regions. In reality as inferior to them in value, as the cut glass is to the rough diamond.

The northern Nations of Europe, cut, tear or grind inferior peoples; like diamonds in contact with softer stones. They leave their marks indelibly engraved on the page of a nation's history, reduce a savage tribe to a civilized form, and like the "stone cut without hands," grind the intractable Nations to dust.

In proper hands a very small diamond will cut, grind and assist in reducing into form, a large stone. One Englishman of energy, may rule a whole province in India, whose population

has not in general that hardness, which can resist his concentrated power.

Diamonds are easily broken and crushed to powder with the aid of an iron-hammer. Those who are refractory among the diamond-nations of Western-Europe, will be "Ruled with a rod of Iron, and dashed to pieces like a potter's vessel." But their very dust will be the instrument in the hands of the great Jeweller, for cutting all softer stones, and polishing those of their own kind, to fit them for offices of ornament and beauty.

The sharp-edge of the diamond as naturally found, is alone fit for cutting glass, or other silicious-materials. A man to be a true ruler and commander amongst men, must be naturally keen and sharp. No amount of polishing can give him this; it rather detracts from his native power.

The ruby, the sapphire and the emerald-corundum, rank next to the diamond in value among precious stones, and may typify great nations. The ruby may represent the nations of Arabia; while the sapphire may those of Persia and the emerald the Brahmins of India—all valuable in a high degree, but still inferior to the nations precious as diamonds. The ruby is perhaps the rarest and scarcest, and the sapphire next; but the emerald is almost equally precious.

The jacinth or ligure, is a hard stone not of great value, unless of extremely fine water and large size. Being of a copper-colour it may typify the Red-men of America.

The oriental yellow-topaz, typifies the Chinese, who have a saffron-complexion; while the smoke-coloured varieties, may represent the swarthy-Calmucks, allied to that great race. Diamonds are a hundred times more valuable than topazes, although the latter are in far greater number. The Chinese are much more numerous than Europeans. These stones are far less precious than the diamond, the emerald and the ruby. The beryl, the carbuncle, the chalcedony, the onyx and the agate, belong to a still lower class.

The onyx represents a *hybrid*, the result of a union of black and white: while the sardonyx is an illustration of a union of red and white races. The beryl may represent the greenish-olive Nations of the Pacific. The chalcedony may typify light hybrids, nearly white, with a few streaks of colour of irregular quantity and quality, forming crosses of little value.

There are diamonds of almost every hue, but they are mostly very rare, and correspond with uncommon and wonderfully gifted specimens of inferior races. Thus there are black-diamonds almost as dark as jet, or Toussaint L'Ouvertures, and about as rare. There are yellow-diamonds, answering to genius

among the Chinese; and there are pink-diamonds, as there are wonders amongst the Red-tribes.

All these coloured-diamonds, must be regarded as mere curiosities for the cabinet of the mineralogist; just as these examples of men are but oddities and rarities in the note-book of the biographer. Their colour is regarded as quite out-of-keeping with a stone in which purity is the greatest merit; and this purity is understood by men in general, to be but an indication of the valuable qualities recognized in the diamond type.

We prize coloured-diamonds perhaps more than ordinary diamonds of equal size, as we do these curiosities of Ethnology, as specimens of what a race can produce; but who greatly deviate from its type. Being in fact in almost every instance as different from their parent race, in mental constitution, as the yellow varieties of the crystallized carbon, are from that topaz which they resemble only in colour.

CHAPTER XIV.

CHARACTERS OF MEN ILLUSTRATED BY CHEMICAL ELEMENTS.

IRON—STEEL—OXIDES OF IRON—MANGANESE—NICKEL—COBALT—ZINC—BRASS—CADMIUM—BISMUTH—URANIUM—COPPER—BELL-METAL—LEAD—CHROMIUM—TIN—ANTIMONY—ARSENIC—SILVER—GOLD—QUICKSILVER—PLATINUM—RHODIUM—PALLADIUM—IRIDIUM—OSMIUM—THE CHEMISTRY OF LIVING ORGANISMS—THE NINE CLASSES OF ORGANIC SUBSTANCES.

IRON being one of the hardest and most tenacious of metals, has long been accepted as typical of what is strong-willed, enduring, vigorous and sustained in the human constitution.

Iron is the principal colouring matter on the Globe, being much used by the Divine architect, and by those who endeavour to imitate Him in the colouring of bodies. The different combinations of iron are no less important in their uses. Steel is a compound of iron, carbon and various other substances which differ in proportion to its qualities; suited to so great a variety of purposes.

If iron is a type of firmness, carbon is of the combativeness which supports firmness in its determined course, "steeling" it against the action of other faculties. Steel is an even more enduring metal than iron, and being much harder, cuts through life better. Combativeness must be combined with firmness, in a hero of the great "battle of life."

Steel in the hands of skilful manufacturers of the age, becomes a "precious metal," rising higher than gold; although its original source iron, is the cheapest and commonest of metals. A pound of iron may be made into Fifty thousand pendulum watch-springs, and thus become One hundred thousand-times the worth of the raw material.

If steel is a type of firmness well supported by courage, these applications of steel, more precious than gold, are illustrations of resolution in what is good and right, which is so highly valuable.

Varieties of cast iron are "obstinate" when cold. Hammering may crush or crack, but cannot alter their forms. When over-

heated, they, like the obstinate pigs after which they are named, run with facility towards the trough or gutter.

Steel or iron is the metal used for balances, knives, weights, swords, cannons and guns. Typifying justice, division, decision, execution and the vengeful tongue of the destroyer.

There is a great difference between "cast" and "wrought-iron." The first is harder even than the second; but is easily cracked and broken by a concussion, which would not affect the other. Cast-iron is a granular substance, and wrought-iron is a bundle of fibres.

Men in whom the Bilious or fibrous temperament predominates, have often an "iron-will," and a complexion like the brown-oxide of iron. These persons have muscles of such strength and toughness, that we compare them with "wrought-iron." They are popularly called "wiry."

Iron is almost exclusively worked with tools of its own metal. Those of other metals make no impression on it. In like manner "iron-willed men," can alone control, or aid in reducing to subjection, those of similar character.

We are in one of the later-ages—"the Age of Iron;" but it has become as valuable as gold. The great abundance of metals in our days, has caused it to be the type of *every age;* for gold, silver, brass and iron have each a prominent place. The age of Stone is passing away, and that of METAL is more and more coming in.

The different salts of iron, are highly important in medicine and the arts. They exercise a stimulating effect on the blood; stirring it up to deeds of valour, by infusing some of the "iron-element" into the veins. The salts of iron are apt to exercise an astringent or drawing effect on the body, and to make the frame more compact and "wiry." But this course of iron must not be carelessly used with delicate constitutions, such has caused the death of many. The human-body like the machine, may be screwed tighter than the frame can bear, and so what formerly exercised a conservative influence, loses its binding power, and the complicated "machine" falls to pieces by its own weight.

Iron is unsuited for some purposes, because of its great affinity for the oxygen of the air, and the hydrogen of the water. The most delicate cutlery, or the roughest castings, are alike destroyed by these agents in a short time. Yet this rust,—so unlike pure iron, can be reduced by great heats, back to its original metallic-state.

Iron and carbon largely contribute to the greatness of England. These are combined in cast-iron and steel, for which she is so famous. The source of "cast-iron" is the clay ironstone. The feet of Nebuchadnezzar's image were made of "Iron and

Clay;"—"partly strong and partly broken;" which signified at once the *strength* and *weakness*, the Centralization and Division of the Roman Empire. The "clay-ironstone," illustrates Britannia as a Roman province. The "cast-iron" as the civilized British Empire; which has succeeded. It possesses the hardness of the iron with some of the friability of the clay. The "Iron and clay" which did not "cleave together," may also as suggested by Gervinus, typify the intermixture without union, of the Celtic and Teutonic Nations.

Steel though a compound metal, contains few of the earthy impurities which make cast-iron crumble to powder. Steel the emblem of what is Just, Right and Powerful on Earth, will last until the age of rust comes on. Iron and steel, unlike most other metals, generally last longest when used; for idleness is more destructive to them than rough treatment.

The men of iron are more injured by indolence, than by the hardest labour. The "Iron-age" cannot be destroyed by those of the other metals: its decline must proceed from the neglect of opportunities of usefulness.

Sulphur has a great affinity for iron, rendering it brittle, and destroying its useful and characteristic properties. It is here a type of "the Angel of Destruction," bent on surrounding "the iron age" with exhalations from volcanoes of evil passions. Iron when once corroded by sulphur, cannot return to its original purity, without passing through a roasting-process in "the furnace of fire."

The bisulphide of iron (iron-pyrites) contains a double equivalent of sulphur, and shines like gold, for which it has often been mistaken. It is a type of the "kingdom of the Evil one," which shines with a false lustre, but crumbles to dust on great concussion. Iron may be made to part with its sulphur and become pure again; yet it has always an affinity for this element. They must be kept apart or they mix.

The oxides of iron are various in colour and properties. There are human beings whose complexion and hair, show a resemblance to these substances: we may compare them with the different temperaments of men. The protoxide,—very dark brown when pure,—the most powerful as a base, is a type of a dark brown-haired, "wiry" person, whose hair owes its colour to an iron source. The sesquioxide of iron is of a red or brown colour, varying in shade, and answering to many red- and fair-haired tribes, who leave behind them like this oxide, an indelible iron-mould.

Iron-stains are difficult to get rid of, and so is red hair. A visitor to an Irish village asked why so many of the children had red hair. "The priest has red hair" was the prompt reply.

The Black or magnetic-oxide of iron, which is the lodestone, is a type of raven-black-haired individuals, so popular "in the matrimonial market;" which is probably one cause of the increase of black hair in our population. This hair has magnetic attractions like this oxide; and black eyes are Magnetic-poles which exercise some influence at a distance; but are often "irresistible" when brought into vicinity with eyes of another colour. And as in the law of magnetic-attraction "the force decreases inversely with the squares of the distance;" so does the power of those "animal-magnets" black eyes.

The influence of the lodestone is not always permanent; for it may readily be diverted from one variety of iron to another. And in like manner human magnetic-currents, vary "in points of polarization" with time and place.

Manganese is a metal allied to iron in many of its properties; but it has an even greater affinity for oxygen; and is so brittle as to be unavailable for making tools. It communicates this brittleness to other metals, and spoils them also for malleable purposes.

The salts of manganese, particularly the manganic and hypermanganic acids, and their salts of potassa, change colour so remarkably, that they have been named "chameleon minerals."

The changes and transformations which chemistry unfolds to us, are greater than are found in other departments of knowledge; for here form, colour, specific-gravity and properties, undergo great modifications. These varied transformations, are but types of extensive changes in Man's life. Chemistry is one of the pillars of physical science, one of the great props that support "the temple of knowledge."

The presence in iron, of manganese, silicon and phosphorus, even when in too small quantities to convert the whole of it into "a salt;" exercises on its malleable properties, a most pernicious influence. They act like the dog in the fable; who took possession of a manger of hay, and refused to allow the ox to approach and eat, although he could not himself feed there.

"Nickel," with which the slang term "Old Nick" is connected, is an ore from whence the metal nickel is extracted. These ores,—found by the German miners of the middle ages, in search of those of silver and copper, were at first mistaken for them. But yielding none of these metals, they were supposed to have been created for the disappointment of man, by the malicious "Spirits of the Earth." Hence they received a name similar to that bestowed on Satan.

These ores anciently thrown away as useless, are now in great request, for the manufacture of "German" or "Nickel-

silver,"—a compound of brass and this metal; far inferior to silver, and in many cases highly poisonous! The change in the estimation of nickel, is typical of that which has come over the public mind, with regard to the Being who was supposed to be connected with this mineral. In former ages he was dreaded, and his power for injury acknowledged. Now his existence as an evil agent is often overlooked; and his power is even invoked, for such useful purposes as "rapping" or "table-moving," by those who forget how soon he may "turn the tables" on them.

Information derived from such a source is not necessarily *truth*, although it may form a substitute for TRUTH; as this base metal may for the silver it somewhat resembles. The poisonous qualities of nickel, are greatly increased by the large amount of arsenic with which the impure metal is contaminated.

Cobalt is most familiar to us from the uses of its oxides and other salts in the arts. They have not beautiful colours; yet when dissolved in enamel or glass, they form the pigments, known as "cobalt" and "smalt." The oxides and phosphates, give to glass, splendid tints of blue and red, which may be made either transparent or opaque, according to the medium used. These are the chief applications of cobalt, which was associated with nickel, in the curses its ores drew from the mouths of the German miners.

Such brilliant and permanent colours obtained from "the Earth," are types of an unchangeable state when things will not transform as they do now. The fugitive, yet ever-blooming colours of Organic substances, are types of living progress, waving too and fro, but still progressing. Every spring supplies as exquisite flowers as the preceding, and as the world advances in age, those of richer and more mature tints, will burst upon the brightening scene.

Zinc is very brittle, being of a crystalline character. It is easily melted and cast; and at a temperature little above boiling water, may be hammered or drawn into sheets or wire; but when cold it is intractable. This metal has a great affinity for oxygen; and in fine shavings or turnings, will burn like wood, throwing out a bright-coloured flame. Zinc when exposed to "a good red-heat" in the air, smoulders into a yellowish white oxide—"the philosopher's wool." It may be volatilized at white-heat, and distilled like quicksilver and some few other metals. It is excellent for taking casts, and is used to form false bronzes which are afterwards lacquered over to imitate that metal.

Zinc suggests treachery, by exploding or smouldering away when we little expect it. The chloride of zinc—a virulent

poison, forms an excellent means of disinfecting, by destroying subtile animal- and vegetable-poisons; in accordance with the principle adduced in "Romeo and Juliet,"—"One fire burns out another's burning." This principle is often shown in the "Moral-world," by the manner in which an agency not good in itself, is the means of counterbalancing or destroying a worse.

But the great use of zinc is in the manufacture of brass; a metal intended to imitate gold. Yet "what a falling off is there;" a poisonous smell; a lustre that fades and turns green with damp air, or brown with smoke, or cankerous-green with vinegar;—and yet it at first shows a brilliant face.

Brass has long been accepted as a type of pretence with little reality; of Great sound of Trumpet with little music. It is a poisonous metal whose wounds leave a canker. Brass as a metal and "brass" in human character have their uses. They are vulgar it is true. But common metals and vulgar people, are wanted in a world, where every one is the better of being able to play on "his own trumpet."

Brass wears remarkably well, both in water and out; but requires frequent scouring by rough hands or it gets rusty and foul. In like manner our "brazen-faced" friends, require to be confronted by those who can oppose them with vigour; they become more "polished" and pleasant by the process.

Brass we have said is a compound of copper and zinc. Copper represented "Venus" among the ancients: and if zinc is a type of treachery, brass the union of these metals, may typify qualities in the character and conduct of "the libertine."

Cadmium is a metal resembling zinc, with which it assists in the art of photography, its iodides and bromides being more soluble in the alcohol and ether of the collodion, than the other "bromo-iodizers." The sulphuret of cadmium is one of our most brilliant yellow-pigments, and with cinnabar forms a fine scarlet. Cadmium possesses many of the properties of zinc, but is volatile at a much lower temperature, by attending to which it may easily be separated when the two metals are found together. It is much less easily acted on than zinc.

If zinc is a type of a treacherous character; cadmium by its greater volatility, is that of the "slippery person" who flies away when provoked.

Bismuth is very brittle, melts at a lower temperature than most metals, and is capable of assuming beautiful, crystalline forms. The subnitrate of bismuth, its most important salt, under the name of "pearl-white," is often used as a cosmetic by those who wish to appear fairer than Nature has made them. Its immediate effect is to produce a leprous-whiteness of the skin, which when exposed to foul-air or sulphurous London-

smoke, may assume a mulatto-hue; an alteration caused by a change in the bismuth, from a white—"nitrate," to a black—"sulphide."

Those who hope by the use of unnatural means, to improve points of which they disapprove, find they are grievously wrong, and "only mar instead of mend." Under a course of bismuth, a skin "slightly tanned," becomes very "like leather."

Bismuth is the principal ingredient in the well-known fusible-alloy, which is used for taking casts of Organic-substances. Metals are eminently adapted for castings; and those which require great heat to melt, may be said to be "powerfully cast." A type of a strong-minded man, who cannot be moulded without a great deal of "blast" and force. These alloys of bismuth, melt almost as soon as they are put into hot water, and take the impressions of whatever they are near. Like the weak-noodles who run into, and take any "fashionable form" they fall in with.

Uranium, a scarce metal, is principally obtained from the "pitch-blend of Saxony." It is chiefly valuable on account of its oxides, which give to glass and enamel, beautiful black, and pale yellow tints. An attempt has been made, to use the nitrate of the peroxide of uranium, as a substitute for the nitrate of silver in photography, but being less sensitive to light it is not so suitable; proving it to be a less "noble metal." These part easily with their oxygen; while the "ignoble" tenaciously retain it.

The "noble metals," from their purity and permanence, are emblems of incorruptibility and immortality, which hold so little to Earth, and feed so little on its atmosphere.

Copper—known to the ancients, is of a brilliant rich colour, unlike that of any other pure metal. When finely polished and free from oxide, it is a dazzling object. It is exceedingly malleable and ductile, and much softer than iron, but less apt to rust either in air or water. These properties render it a favourite on board-ship, for "Jack" abhors rust.

Copper is an unwholesome metal unless in a perfectly pure state. It is the principal ingredient in brass, bronze and bell-metal. Being extremely sonorous, it takes the first place, wherever "high-sounding" metals are wanted. Hardly any musical instrument is made without it. Bells are never hung without it, for the handle contains copper, as well as the *bell* and the *wire*.

Belles in society are most effectually set in motion by "wire-pulling," which is often connected with what is "brazen," and is an "underhand" process.

Copper in its native state is usually combined with sulphur

or arsenic, and in this connexion typifies a *death;* which so frequently succeeds a love affair.

Arseniate of copper and its combinations, although of fine, green tints which rival the most beauteous hues in the vegetable world, are pernicious when applied to the house or the toilet. For they corrode living plants or animals, and communicate to inanimate objects, the brilliancy, but poisonous properties of arsenic and copper. This poisonous bloom, this mockery of healthy green, forcibly illustrates vices, which wear an aspect of pleasantness to the eye.

Copper in its natural and artificial combinations, yields many shades of green, which form permanent pigments when ground. Thus there is the malachite—a carbonate of copper, containing water of crystallization. It is found in Siberia and Australia, and is much prized for ornamental purposes, but does not wear, like a silicious-mineral.

Copper is the principal ingredient in gun-metal, which divides with Iron "the service of war." In ancient as in modern times, —Mars to whom iron was sacred divided with Venus the presidence of battles. "The smiles of the fair," being often as necessary to good fighting, as good swords.

> "Store of ladies whose bright eyes,
> Rain influence and judge the prize."

And "Venus" has sometimes as much to do as "Mars" with the occasion of conflicts.

The preparations of lead, the heaviest of the common metals, are mostly sweet but poisonous; yet they do not directly take effect on the body. Lead was anciently sacred to Saturn. The influence of Satan is sometimes like that of a slow poison; for a long time scarcely perceptible from its stealthy movements; yet not the less capable of injuring Man.

The oxides of lead are of the highest importance in the arts. Litharge—the protoxide, enters into the composition of glass, and the glaze of earthenware. It is a means of purifying oils for varnish, and forms with them an insoluble soap-plaster, called "diachylum." This is useful for protecting sores from the action of the air, and forms as it were "a glaze" for their conservation, like that on earthenware. This coat of varnish, composed of poisonous materials, protects delicate objects against the attacks of still greater and more virulent poisons.

Red-lead is much used to preserve wood from decay. Its action resembles that of mineral-poisons generally, which kill, but arrest decomposition to a great extent. When men are once dead, as regards their Immortal portions, changes are retarded; for the variations of organic life, cease.

Lead-pipes convey the water that we drink, that purifies and revives us. Were this fluid pure, it would soon corrode the lead and become poisonous. Most water is impure, and contains sulphates, which form an insoluble coating on the surface of the metal pipes, which protects them from the further action of the water.

This is highly significant as a Moral-illustration of the impure channels through which we derive our Truth. They would soon be utterly corrupted, but for counteracting influences, not perhaps in themselves good; but antagonistic. The combination of two virulent poisons, often produces what is "neutral" and harmless. TWO BAD MEN MAY DO GOOD IN OPPOSITION TO EACH OTHER.

Chromium was so named on account of the brilliant colours of its compounds. It forms with silver, lead, mercury and potassa, salts of bright red or yellow tints. They are exceedingly corrosive and consequently destructive to organic-compounds, which they force to combine with oxygen, with such violence, as to occasion explosion or decomposition:—such salts are highly poisonous. Chromic-acid contains an excessive amount of oxygen, but holds it very lightly, yielding it with but little pressure, at the first demand of most bodies. This reminds us of those whose sense of right is but "loose," and who let it "slip" with slight temptation; a weakness which leads to their own destruction.

"Tin when bent, utters a grating sound," from the friction of the crystals of which it is composed. It has a great affinity for iron, to which it readily adheres when in a melted state. This coated-iron is the "tin" or tinned-iron of commerce. It rusts less easily than iron, copper or lead; hence it is a cleaner metal to handle. The peroxide of tin forms enamel, when dissolved in melted glass. The bisulphuret or "mosaic-gold" is a common counterfeit of that precious metal, while its protochloride, yields with the perchloride of gold,—the "purple of Cassius;" a fine tint, when applied to melted-glass.

Tin was dedicated to Jupiter; and in preserving other metals from rust, it plays a part similar to that which was assigned to him in keeping order among "the gods." Yet tin itself liable to rust, is illustrative of the impurities of "the Father of the Gods."

Tin as assisting in the formation of the principal mineral-purple, is an important type of rule and authority; but true gold is necessary to produce the brilliant-result; the sham "Mosaic-Gold" will not do.

Antimony is one of the principal ingredients in the metal of which the printing-types are made.

If antimony is the great remover of obstructions in the human body, these metallic-types, are the great agents for removing those obstacles, which hinder the progress of knowledge.

We have already shown antimony to be one of the most "combative" of metals. Its chloride is used to prevent rust in gun-barrels. Its sulphurets, form with nitre and charcoal the blue signal-light, which sets itself in opposition to night, by illuminating a great chasm of darkness; and with chlorate of potassa, form a detonating-mixture, more powerful than gunpowder.

Arsenic has already so bad a reputation, that it seems almost superfluous, to say anything that would put it in a worse light. It forms with hydrogen, one of the most poisonous of gases, which cannot be inhaled without occasioning death.

Arseniated hydrogen, whose vapour utterly destroys organic life, is a type of a chief minister of Beelzebub whom the metal arsenic itself illustrates. Arsenious acid—an oxide of this metal, is the preparation in most common use, and has a sweet taste and form, like sugar. This deadly poison in the guise of a wholesome substance, may typify "Satan transformed into an Angel of Light."

Arsenic will combine directly or indirectly with most metals and elements: but the combinations are usually poisonous. The influence of Satan is most general and destructive.

Sulphur and arsenic combined, yield the red and yellow salts used in the manufacture of green and other coloured fires in pyrotechny; but their fumes are of a pestilential character. Arsenic imparts its brittle character to other metals. It is a means of rendering lead, more inclined to take a globular-form, and so it plays an important part in shot-manufacture. It increases the destructive power of lead, in making it more fit for killing animals. The circular-form to which arsenic contributes, rolls with greater facility, the tide of death and destruction round the globe.

Arsenic, the most powerful arrestor of decomposition in animal-tissues, is the poison most frequently used in destroying their life. Its analysis and detection, present types of the means of tracing the presence and machinations of the "Evil-One."

Arseniated Hydrogen, may be easily reduced by heat to its original metallic-state, so as to form a shining, black mirror, which disappears entirely when a stronger heat is applied. The analyst in this case, reminds us of the "magician" looking on his mirror, until it is lost in smoke. This dark and volatile arsenic, has just the colour and properties of the fabled being, "with Horns and Hoofs."

Silver preserves its purity and delicacy in air, in water, and in the hottest furnace. It only becomes purer as it is heated and refined in the cupel; any rust that is there, is reduced back to the primitive metal. Its affinity for oxygen, being so much less than that of most inferior metals, they retain or absorb it at the melting-point of silver, which affords a ready means of separating these different elements. This is referred to in Mal. iii. 2, where our Lord is compared to "a refiner and purifier of silver" watching the process.

The surface of the melted metal in the cupel, is at first red or orange, with an undulating variation of colour. As the air is blown on the surface it becomes lighter, brighter and more silvery by degrees, until the melted metal appears like a looking-glass in which the image of the refiner can be seen. The process is sometimes a long one, and is done through the agency of lead, which as the air is blown on it when mixed with the silver melting in the crucible, is either oxidized and blown away, or absorbed in the crucible.*

This throws much light on the pains which our Lord will take to "purify the sons of Levi," who will probably undergo the sorest afflictions, until at last as in the pure and bright mirror of the melting-pot, the reflection of the image of the master refiner is seen.

Silver cannot be volatilized, neither can its oxides be produced by heat. It has a lustre like the moon, and is one of the most ductile and malleable of metals; yielding only to gold and platinum in these respects, and exceeding all others in beauty and brilliancy. As the emblem of the moon, it is a type of the Church, the light of "a benighted-world;" while gold, the emblem of the sun, typifies "the Sun of Righteousness." When He rises, then will be the second "Golden-Age."

Silver is oxidized by acids alone, and nitric acid is the best medium for this purpose. The "lunar-caustic" or nitrate of oxide of silver, is a compound of this salt and nitric acid; but it feebly retains the acid. The presence of any baser-metal, such as iron or copper in the soluble solution of its salts, causes it to return to its pure metallic state, and to forsake the acid with which it had formed an alliance.

This nitrate of silver is a type of "the church" corrupted, which parts with its impurities in the "age of iron and brass," and returns to a pure state.

The custom of plating base-metals with silver, to give them its lustre and superficial-appearance, has been common in different ages of the world. The various improvements in the art of counterfeiting silver, well illustrate the growth of hypoc-

* Compare Napier's Metallurgy of the Bible, p. 24.

risy. The ancient plated objects of the Greeks and Romans, typify the hypocrites of apostolic times, who on a foundation of what was impure and base, affected the external habits of the saint.

The old plating processes were superseded by the mercurial: a more efficacious counterfeit, but thrown into disuse by the even more perfect "electro-plate." By its aid, a coating of silver of any desired thickness, may be placed on the basest-metal, so as to give it an appearance of perfect purity. Electro-plate is warranted by the advertisers of the age, to be "for every purpose equal to silver." These complete forgeries, are types of modern Arch-hypocrites in the Church, who are so entirely covered with what is pure, that they appear to be most holy.

The coating of silver on electro-plate, in time wears off, and the base-metal underneath is perceived. The hypocrite's-"cloke" at last becomes tattered, and his *true* character is seen. Plated-articles are of little value for the melting-pot. Hypocrites cannot stand the fire of persecution.

The galvanic current, "the presiding spirit" of electro-metallurgy, is a type of the unseen agency so much tampered with in the present day.

Nitrate of silver is one of the most important chemicals of the age. Its old uses as a cautery and tonic, are small, compared with its value in the modern art of photography.

Gold and silver, the emblems of the sun and moon, may be said to preside over this Art; the sun is the means of taking pictures, and the moon, whose rays have so little actinic power, is the type of that light by which the artist sees his work during the process.

Nitrate of silver most easily parts with its oxygen and acid, to any organic substance under the influence of light; hence its value in photography. The rays which affect the salts of silver and other metals, constitute but a part of the solar spectrum. This explains the photographic art, which would be impossible but for this limitation. Did all light, affect photographic chemicals equally, the process would be complete ere it could be seen.

Iodide and chloride of silver, being more sensitive to light than the nitrate, and parting with iodine and chlorine through the influence of light alone, without the necessary intervention of any organic substances, are at once pointed out as the photographer's most precious servants. The action of light on these substances, reduces them to their metallic and semi-oxidized state, which is effected in a gradual and delicate manner, by the use of collodion in the glass, and albumen, gelatine or other foreign substances in the paper processes.

Unfortunately for the beautiful art of photography, these sun-pictures, like some sunny and bright scenes of our imagination, are fugitive. But "the brightest do not fade the fleetest."

The present state of the albumen process in photography, may illustrate the fugitive beauties of earth. The carbon process which has every prospect of permanency, may typify unfading-beauty. Like the carboniferous-rocks, it will carry down to remote ages the *vivid* representations of a living-past.

Chloride of silver is like pure white-curd when first formed, but is completely decomposed by the action of light, and becomes black and uncomely. Like our deeds that retain their delicacy only in the dark, when "a veil is thrown over them."

The celebrated "fulminating-silver of Berthollet," a compound of oxide of silver and ammonia, is one of the most explosive of substances, for when dry the touch of a feather is sufficient, to produce a violent detonation. The noise of it sounds very loudly, like "the report" of any disorder in the Church. The oxide of silver represents the Church somewhat corrupted, but in an inert state. The ammonia typifies what is actively impure and contagious. The union of the two, foments mischief, and a mere trifle is sufficient to occasion a great commotion.

Gold shines out at once with a precious lustre, unapproachable by other metals. It is more generally distributed than any other metal, except iron and the bases of the alkalis and earths. Gold is unaffected by hot or cold oxygen-acids, which dissolve silver and other inferior metals. Its great specific-gravity, brilliant-lustre, and scarcity in quantity, have caused it to be more ardently sought after than other metals, and to be the type of whatever is precious or desirable among the time-honoured treasures of earth. Were it not so widely known it could not have become a standard of value in so many countries.

It has been coined ever since the days of Darius; at a period not much later than that in which the most early silver coins of Ægina and other Greek cities first issued from their rude dies. Since that period it has been considered an indication of wealth and advanced civilization, for a nation to possess a Gold-currency. Then is truly the "golden age" of a nation's commerce. Then its chronicles are written in Letters of Gold. But these are dazzling, and may make our eyes blind to the light and shade of history; though it fill the brightest pages "of the book of time."

A silver-currency though inferior to a gold-currency, may yet exist in an advanced state of civilization. But the bulk of silver in proportion to its value, is so great, that it becomes

manifestly unfit to play the part of gold, when man has attained his highest condition. But the iron, the least polished of all, is the age of what is rough, harsh and hard. Such was the time of Lycurgus and his iron-coins. But the iron-coinage of Japan, accompanied as it is with that of silver, bell-metal and gold, is a type of a state of society which has varied qualities. Wealth and power are illustrated by gold and silver; self-confidence by brass; and hard-energy by iron.

Gold—one of the softest but at the same time the most malleable and ductile of metallic bodies, can be drawn into wire nearly as fine as the thread of the garden-spider, which may be woven into gold-gossamer, to catch the literal flies. A web of gold, spun by "the spiders of the Stock Exchange," entangles and ruins many Men of moderate means.

The softness of pure-gold, renders it unfit for those purposes where it would be much exposed to abrasion; and so from early-times it has been thought advisable to alloy it with copper or silver; by the help of which, it is made more fit for common use. But pure-gold, to the cultivated eye, possesses a far more beautiful shade than any of its alloys, and passes through the fire without loss of this colour.

Common-characters are fit for common-purposes, and perform the ordinary duties of life; perhaps better in the world's-estimation, than pure, exalted-characters. They have a Good share of golden-honesty to be admired, yet this is somewhat alloyed with tricks of trade, or professional sleight of hand, esteemed by them necessary to success in life. Man with his varied-character, may be compared with the different parts or "carats" by which the fineness of gold is estimated. Alloyed-gold may thus be typical of human nature; for there is no man who does not possess some good quality, however much he may be corrupted. The "gold" in him, may be purified from "the dross," and he may be cast anew in "the Image of his Maker."

Pure gold is represented by twenty-four carats, which we believe to illustrate perfect honesty and integrity. Most nations know what pure gold is, and they prefer it when given to themselves; but they do not so commonly give it to others, for it is quite the exception to meet with it in commerce.

Many of the German-States, issue base metal, which they pass off as silver;—a type of their governments, their public-faith and their national-conscience. The currency of Austria is particularly debased; the silver being very impure; but the Austrians are not so badly treated by their rulers as some of the petty States of Germany, whose silver is half-copper, if not altogether free from lead. The French-standard is not so high as the British and they deduct from "their currency" the value

of the coinage-process, while the British, issue their gold at the value of the metal. We do not adopt a currency of *pure-gold*, for such would be unsuited to the tricks of a commercial-nation; but still our standard is higher than that of most nations, and is of gold,—not silver.

Silver has been "the standard" in India for a long period. It was so till lately in France and over most countries on the continent of Europe. If nations were to adhere "to their standard," so much injury would not be done to society, but the frequent variations in it in some countries, derange commerce. Let nations by all means abide by their agreements, for a breach of covenant is the most flagrant moral obliquity.

The alloy of gold with silver and copper is significant. Copper or brass harden gold, yet would injure its colour, but the addition of silver renders it much more white and like pure gold. The copper and brass, represent boldness and assurance which would be too offensive if not toned down by what is purer. Pure gold by retaining its lustre and impressions longer than any of its alloys, may represent the highest order of virtue, which is appreciated at last. It is only the "gold" in man that can stand the test of time, the "dross" is forgotten.

Gold is an article in universal request; it is beat out into thin-leaves, which ornament the commonest objects in use;—so, few persons can now say, "silver and gold I have none." Its brilliancy goes far to hide what is dusky, or to enliven the dullness of sombre objects. It shines from the gloomy bookcase, from the picture-frame or the salt-spoon; like the sun in a dark-corner, which it gilds with its sprightly refreshing beams, that dance to the music of light.

The astute-moralist cannot condone impurity under a brilliant-exterior. Sin when overlaid with gold is only *gilded*;—"a cloke to hide" what is black and sombre and cannot bear the light. Many Guilds, but for their golden-cups would perish in gloomy-obscurity.

A single pound of gold, can gild silver-wire to encompass the globe, and the typical *pound of gold*, the British sovereign, goes everywhere; buying what is to be bought, into "The fold of Civilization." The Chinese as yet, chiefly care for our silver, gold being too far beyond their standard of brass: for all coins of other metals used in the "Celestial Empire" are of foreign mints, which the Chinaman is in general, willing to receive in return for his brass, but prefers those of silver. Foreign merchants accommodate themselves to these celestial tastes, and assist to drain Europe of the precious-metals.

Quicksilver was sacred to Mercury, the most volatile of the gods; and quick as a messenger of destruction it is among the

"gods" of the sick chamber; coursing through the veins with "winged-feet," and reducing to a state of salivation;—often called "salvation."

Mercury is fluid at ordinary-temperatures, and has a high specific-gravity;—hence its value in thermometers, barometers, or as a counterpoise. Quicksilver is poisonous to organic-substances, which rebel against its use almost as much as against antimony, the emblem of opposition.

Mercury retains its lustre in water and in air, hence it has been considered "noble." From its fluidity and subtlety, it is the circulating-medium among the metals. It has great affinity for copper, lead, tin, gold and silver, rendering them capable of being applied to plating or gilding, which is one of the most extensive uses of the metal. As it permeates copper or gold, it renders them brittle or rotten, notwithstanding their tenacity. It has an equally pernicious effect on the human constitution, and no part of the body is safe from its malign-influence.

Mercury combines with most acids and elements; forming salts, which when soluble are highly-poisonous. Particularly the bichloride of mercury, which under the name of "corrosive-sublimate," sublimes when the sulphate of mercury is heated with the common salt of the kitchen, and by its power of arresting decomposition, stops at the same time the progress of life and decay. Sulphur and mercury have a great affinity, and their union results in two compounds; the yellow protosulphuret and the persulphuret, which is either black or red. It is in the red-state the cinnabar or vermilion of commerce, which being insoluble, may be handled or applied to the skin, with a much less injurious effect than other preparations of quicksilver. It is already saturated with as much of the poisonous sulphur as it can contain, and is therefore comparatively inert. It is like the snake which has swallowed its prey, and whose ferocity and poison sleep; or like the giant who is drunk, and whose nerves are paralyzed with a venom, even more violent than his own.

Another important use of quicksilver, through which it finds its way into every civilized-house, is in the preparation of the amalgam of tin, which lines the backs of mirrors. They display our faces as well as those of our friends, and assist at important optical illusions; for when artfully placed, they lengthen apparent distances. When not perfectly even, they give to the features a twist or inclination towards one side; a type of our commonly incorrect view of objects in the "mirror" of life: this is true of all ages past and present.

We look down upon a clear-brook; a dancing-image displays itself to our view with twice the motion and apparent life of the original. This living looking-glass, presents more sprightly-

images than inanimate-glasses do. It is the analogue of the mind, reflected through the medium of life, as the mirror is, of that of past-days: for it is a still-medium ;—a glass that reflects our shadow as a corpse. The reflecting-brook, may be compared with the journals of the present day, as the still-mirror may with the chronicles of the past. We have said that the "living-water" presents a more lively-image ; but the inanimate-looking glass it must be confessed exhibits a more truthful representation. In like manner, the records of past days, often give us a more correct idea of the character of men ; and why? —Because the rapid current of Human-life, disturbs the equanimity of the mediums that criticise its features.

Amalgamation in which mercury plays a part, is a process of great importance in the separation of Gold and Silver from the common metals or dross, with which they are mixed. The ores are ground to a fine-powder and digested with the liquid mercury, which combines with the silver and gold they contain; but not with the iron or silicious particles. These float on the surface of the dense amalgam, which is then transferred to an iron-retort, and at a red-heat the quicksilver is volatilized, and the gold, silver and other metals remain.

This amalgamation process is an important type. The ore represents the present state of society, the crushing process the convulsions which are the first steps towards the dissolution of the present fabric. The quicksilver represents evil influences, which are used for the concentration of what is *precious*, diffused throughout an immensity of dross. The dross falls from the "amalgam" as chaff from wheat, which is thus ready for the furnace. The heat liberates the quicksilver, as does trial the evil. The trial is the means of purifying what has in it the rudiments of goodness and purity. The gold and silver are when purified, but little in bulk, compared with the original ore, yet in real-value they outweigh it all.

Calomel is the preparation of mercury most used in medicine. Its name is derived from two Greek words (καλός, μέλας) signifying beautiful and black ; in allusion to the manner in which it is prepared. Those who take much mercury, may be rendered "black," if not "beautiful." Various shades may hover round their skins ; the colours of the different salts of mercury. First pale like calomel ; then black like the oxide ; and livid grey as quicksilver when dead.

Platinum is as incorruptible as gold, but less brilliant and precious. It is coined into money in Siberia, where it passes current ; and is the medium in which the most subtile and corrosive agents of the chemist, are analyzed and prepared. The heat of the most powerful blast-furnaces does not melt it ;

for it passes unchanged, through acids that affect most metals; and its expansion and contraction, influence the index of the pyrometer; by which great degrees of heat are measured. It is heavier than gold, but in its power of being welded at a moderate red-heat, it bears some resemblance to iron. As it does not exceed bright-lead in beauty, it is not so well adapted as gold for ornamental purposes. It has a tendency to combine with the ignoble metals, tin, lead or zinc, which therefore cannot touch it when they are melted, without causing it to melt and combine with them. When pure it is fusible only with the aid of a galvanic battery, or at the oxyhydrogen blowpipe.

Platinum parts with chlorine—its principal solvent, with great ease. Thus if its chloride and that of ammonium, be dried at a red-heat, both the ammonium and the chlorine fly off; leaving the metal pure; but in so minute a state of division, as to resemble a sponge, like which it acts on air and gases. If held in a stream of hydrogen in air, it becomes red-hot, and inflames the gas, its porosity causing chemical-combination between it and the oxygen of the air, with such violence as to produce this great heat.

The platinum is unchanged itself, but is the agent for effecting an important change. This reminds us of the position of some individuals in society, who do much, without great apparent wear of their constitutions; who alter others permanently, without any apparent change in themselves. The various retorts, dishes and crucibles of platinum, perform an office similar to this, being the medium of great chemical-changes, but being themselves generally unaffected.

Platinum is the centre of a system of elements, which cluster about it as the moons do round Jupiter. These metals are palladium, rhodium, iridium and osmium. Palladium resembles platinum in colour, but is less noble, as all the satellites are than their great sun. Palladium is oxidizable by heat alone, while in a spongy state; and can also be dissolved by nitric-acid. It resembles platinum, in forming double-chlorides with potassium and ammonium. An alloy of copper and palladium, can be applied to useful purposes. If the copper predominates, we might think it resembled brass, and could not be "a true palladium."

Rhodium, although associated with platinum, is a great contrast to it, in being brittle like antimony and bismuth. When added in a small proportion, it is said to increase the hardness, and improve the qualities of steel, for such purposes as making drills. In the combination of its chlorides with sodium and ammonium, it shows analogy to platinum and palladium. It is not affected by any acids, except when in a state of alloy;

but experiments are not often made with it, as it is one of the scarcest of metals.

It is strange that substances, existing apparently in such small quantities as these allies of platinum, should be dug out of the sand of the rivers of Brazil or the Ural ; should come to civilized Europe ; pass through the ordeals of the crucible or evaporating dish ; be separated and analyzed with such consummate skill, that they may be presented pure, before the spectacles of profound-philosophers. This searching process, by which no insignificant element can remain hid, reminds us of that long and tedious investigation, by which the different points of evidence, are separated and analyzed in a criminal court, when the case is considered of importance. The accused perhaps are sent home for trial from a distant land ; their appearance excites interest, and different processes are set at work to extract the merits of the cause.

The counsel for the prosecution, fall upon the accused, analyzing the case ; separating its elements, and reducing it to soluble proportions ; as the crude platinum is by hydrochloric acid. The prisoner's hopes of acquittal during this ordeal, are very small. Soon different parties are found to be mixed up with the accused, whose existence was not previously known to the general public. A great deal of backward and forward process, with much heat on both sides and cross-examination is gone through, before the "five pirates from Brazil," can be clearly identified, and condemned to solitary confinement ;—as these poor elements implicated in the trial of platinum, are to a lonely existence in bottles.

Iridium is the densest substance known, after gold and platinum. Its salts are many-coloured ; hence its name, which calls up rainbow-tints before our minds. It is almost infusible and insoluble in acids.

Osmium is so called, from the offensive odour of its oxide—osmic acid.

The elements that have been lately tried, are platinum the chief, condemned to be used up into crucibles, retorts or other dishes, to be passed through the fire to the Moloch of modern chemists ; to be treated worse than if put "under harrows or axes of iron ;" or "to be made to pass through the brick-kiln." Palladium is condemned to a lot not much above poor platinum. It is beat out into gum-plates, instead of gold, by which old ladies are victimized. Iridium with all its many-coloured salts, and rhodium with its shortness of "temper," are condemned to a dull life as curiosities ; unless needed to point gold-pens. And osmium, although allowed to take an occasional share in this process, is like the Negro, rejected by refined

society, for the ill odour which accompanies so many of its preparations.

The chemistry of living Organisms, varies greatly from that of the Inorganic-World, for chemical-agents act very differently on living- and dead-organisms. "The Human stomach," said Sir Astley Cooper, "is not a Wedgewood-mortar." The effect of heat is very diverse on living and on dead subjects. The dead are roasted by a temperature, which the living could support for a considerable time.

Organic-chemistry does not throw much light on vitality, by its direct analysis; but its consideration is necessary, as involving the requirements of life. Inorganic-chemistry *includes all.* It is the chemistry of the elements, whose combinations are and were created for the supply of the exigencies of life. This great-division represents typically, the primitive constituents of our Immortal-parts, which are represented after death and dismemberment in the very essence of our being. Organic-chemistry is much more limited in its representation of man's system. It is mainly typical of those parts of his frame that are less under the influence of his will, such as the involuntary-muscles.

This subdivision of man's-system, is not to be taken in that full and absolute sense, which would exclude him as a unity; but it shows analogy with the division between Organic and Inorganic-chemistry. The second includes the *first*, but the first only contains a portion of the contents of the second. Yet these few elements, by their various and complex combinations, form bodies so diverse and varied in their properties, that we might almost fancy that they contained the whole elementary series.

The so-called Organic-elements are representative of Man's Corporeal-organs, which they feed during life; but our object is to show that what we discover by Organic analysis, is but a very small part of the truth intended to be conveyed. A truth which forms but a link of literality, the typical link being connected therewith.

We shall endeavour to show the connexion between Organic-chemistry and the corporeal-organs of Man. In organic-chemistry, we see frequent imitations of substances in the inorganic-world. Thus cyanogen and melon, although compound-bodies, yet behave like elements, and the alkaloids of vegetable-origin, resemble in many of their properties, the oxides of the metalloids and earths. But these Organic-bodies are much weaker in their elementary and basic-action.

In like-manner the mental faculties and their combinations

that typify the Inorganic-elements, are more powerful and ruling than the mere organs of involuntary-motion, that illustrate the organic-compounds. These exercise an all-powerful influence in their sphere, yet can do less externally, than those organs which from their very nature are of a less material character.

Some classification being necessary in the consideration of such a subject as this, let us consider the Nine sections into which these organic-substances may be divided. The *First* consists of the Salt-radicals;*—and true radicals they often are in their action on other organic-substances; reducing them with the lightening torch of a destroyer to the earth out of which they were formed. The *Second*, consists of the Organic-salt-bases, consituted by the Vegetable-alkalis, while their suitable partners form the *Third*-class or Vegetable-Acids. The *Fourth*-class consists of such substances as Gum and Sugar, which contain the elements in the proportion that compose and form water, but without any nitrogen. The *Fifth*, substances such as albumen, gelatine and fibrine, uncrystallizable, but contained alike in the Animal and Vegetable divisions. The *Sixth*, the carburet of hydrogen and *its oxides*. The *Seventh*, those fatty-substances,—the oils and grease of animals and plants. The *Eighth*, those acids which are formed by the combination of mineral-acids, with such an organic-compound as alcohol; the sulphovinic-acid being the representation of the class. Lastly and *Ninthly*, those substances which are either colouring-principles, or cannot be arranged in any other way.

The elementary-constitution of these bodies, affords little assistance in this arrangement, if we except the nitrogenized-substances; and so we are led to look for types for them; not in the analogy between their elementary constitution and that of mind; but in that between the properties and qualities of each.

Organic-chemistry is especially the chemistry of growth, development and decay, and illustrates that of the more corporeal parts of man; while inorganic-chemistry and its more stable compounds, remind us of those faculties that never die, but which acting through perishable mediums, cease for a while their visible action. But when at liberty to form affinities in accordance with their constitution, they will draw from the soil, elements suited to a new and higher life.

These Organic-substances are mostly unstable in their composition, their very existence depends upon decay. But certain circumstances, suspend this change for a short period. There can be *no life* without decay, as the "Organic-Empire"

* Professor Fownes' division is followed here. See his Manual, 1845.

is at present constituted. But after death it may be arrested; analogous to the state of quiescence without progress, in which Man is, after separation from his corporeal-system. *The more we live*, the more we die. The more vigorously a man moves on the face of the Earth; the more "Worlds he conquers;" be they Material, Intellectual or Moral, and gives evidence of active life; the more rapidly does he cast off the clothing of his spirit, to be renewed as long as vigorous life is given to him. "Vigorous life" is rapid decay, but rapid renewal. Disease and fermentation are somewhat allied, they are both states in which bodies receive assistance from without, from what is in a state of change; which brings about changes for the reception of which they were without doubt adapted, yet needed an external impetus.

Organic-analysis is of two kinds, that which reduces to the primitive Inorganic-elements, and that which reduces to the combinations of those elements which are comparatively stable, and which convey definite-ideas; yet those differing from what the mere proportion of the primitive-elementary contents would indicate.

These Organic-elements are in the first place the constituents of the organic-substances, and in the next they form combinations which in some cases act like elements. The source and progress of life is at present inscrutable; but we can feel, that about which we cannot reason. The mind of man being the type of his body, we use its analysis to illustrate what we cannot individually dissect. In the Mental-faculties, which are analyzed by Phrenology, we see *thirty-seven Primitive-elements*, and a few semi-faculties, produced by the union of two or more. These act like elementary-faculties, in the same manner that the Salt-Radicals, do amongst the chemical-elements. Yet like the Salt-Radicals, they are capable of division into primitive-elements, if the analysis is carried deeper.

Let us continue the illustration of mind by matter. In Organic-chemistry we have alkaloids, allied in some of their properties, but not in their constitution, to the alkalies of the Mineral-Kingdom. These resemble those combinations of faculties in mind, which serve to supply comparative deficiencies in special primary qualities.

The organic-acids are very powerful in their affinities, reminding us of those combinations of faculties which produce great effects with little means, through advantageous circumstances. The bodies of the Gum, Starch and Sugar class, destitute of nitrogen, remind us of those combinations which without progressing, serve to maintain life for some little time; such being the effect of these substances on the human-body. How dif-

ferent is their effect from that of the nitrogenized-class, to which muscles, fibre and sinews belong; without the aid of which the animal-frame cannot grow.

The carburets of hydrogen, are illustrative of the great sources of light to man. The Fats and Oils form the chief fuel which protects his tissues, and are types of that on which his mind glows. The union of a neutral-body with a mineral-acid, results in the formation of the Sulphovinic-class, which illustrates the action of the propensities on particular parts of the body. The colouring principles so generally diffused in the Organic-world, give to it appropriate hues, but are themselves separable into a *Ninth* and last class.

CHAPTER XV.

POPULAR ILLUSTRATIONS DERIVED FROM ORGANIC CHEMISTRY.

SUGAR — STARCH — OXALIC ACID — FERMENTATION AND ITS PRODUCTS — OILS AND FATS—GLYCERINE—WAX — BENZINE—PRUSSIC ACID—CITRIC ACID—TANNIC ACID—ORGANIC BASES—ORGANIC COLOURING MATTERS—ANILINE DYES—VOLATILE OILS—PERFUMES—OIL OF MUSTARD—RESIN—DRAGON'S BLOOD—CAOUTCHOUC—TARS—CHEMICAL AND MENTAL ANALYSIS CONTRASTED.

MOST men and animals are lovers of Sugar, of which there are many varieties. Cane-sugar, produced alike from cane, beet-root and maple, is the richest in flavour, and is what we commonly meet with as a culinary agent. Sugar is the sweetener of our acid fluids, and the mask of those that are bitter and nauseous. It is an emblem of the pleasant-savour, which palliates many otherwise sore and sickening trials.

There are many other varieties of this substance; grape-sugar is one of the most abundant, and is found in most fruits that have a sweet taste. Fruits are much sought after; and the *sweet* are commonly preferred.

What is sharp and acid in the events of life is not agreeable, but like the sour-fruit, it may stimulate our appetites, and assist us morally to digest many a tough trouble. Sugar combines with various bases, such as lime, baryta and oxide of lead, forming poisonous substances, which have a sweetish-taste, sufficiently significant of the character of many compounds of good and evil.

Starch is the great stiffener of fabrics which have little rigidity, the representative of unyielding bulk, as contrasted with elastic fibre. Starch is allied in its composition to the sugar of the Animal Kingdom, and performs a similar office in the nutrition of animals; that of a supporter of respiration, by supplying carbon to the blood. Gum is another substance performing similar offices. The cellulose-lignine-matter, or vegetable-fibre, of which cotton and linen fabrics are composed, is a non-nitrogenized substance, also allied to starch.

Oxalic acid is an important constituent in many sour leaves

and plants in which it occurs, as an acid-salt of potassa. Cane-sugar is the sweetest substance known; and may be taken as the pleasantest in this sense. But the action of nitric acid on it, converts it into this salt, one of the most powerful and corrosive of acids.

This reminds us of a pleasant person with a high, fine tone of mind, who in the power of a cruel tyrant, loses his reason and becomes a vicious and malign character. This strong acid is found in a few shrubs, in an impure state and in small quantities. A type of those persons usually "sour," but who do not like these plants attain that intense sourness, which characterizes those who have been amiable.

Fermentation is the accompaniment of the metamorphosis of the yeast-plant, or other allied organisms, which contribute to important changes in bodies. Pure sugar is the enemy to fermentation, and may be taken as a type of what is Good and Holy. But if any substances containing nitrogen, are present in the proper state of decay, in a solution of sugar, a change takes place, if the temperature is maintained from 70° to 80° Fah. Carbonic acid will then be disengaged with effervescence; the liquid will become transparent, and will contain alcohol.

This change from sugar to alcohol, is eminently suggestive of the fall of man, from his "Sweet state in Paradise," through the introduction of a corrupting influence. Man was formerly pure, and perfect beings could look on him with complacency; but after his fall, only Demons could behold him with pleasure. DRUNK WITH HIS FERMENTED BLOOD, THEY GLOATED OVER HIS RUIN.

This alcohol is not the final stage of fermentation; neither does it typify the Last state of Man. It may be purified and strengthened, but is still the product of "decomposition." Alcohol may be made from a great variety of animal or vegetable substances; almost wherever sugar and a nitrogenized Organic compound in solution can be got together. The earliest fermented liquor was probably wine, derived from grape-juice. This when partly fermented, still retains a portion of its sweetness; and is in this state illustrative of the corrupted condition of our race, who are however not in a hopeless state. Like wine, man may be rendered sweeter, or may pass into a last stage, like that of vinegar;—a type of a hopeless condition.

Wine is the national drink, in such Southern countries as Syria, the south of France and Spain. It is a thinner and more transparent fluid than beer. Those nations who drink it, are not so disposed to corpulency as the beer-drinking inhabitants of the North, and are less inclined to use powerful stimulants, which their weaker constitutions cannot endure. But the

natives of Northern Europe, supplement their beer and fiery spirits, with the strongest wines of southern regions; and earn for themselves the prestige of being "the greatest Drinkers," and "the greatest Drunkards in the world."

Beer is made from grain, which has by soaking in water, undergone the first stage in growth or germination. Such is accompanied by a change to sugar, in a part of the starch it contains. When this growth has gone sufficiently far, it is stopped by drying at a high heat, which is followed by crushing and infusion in water at 180° Fah. After which the mixture, on standing three or more hours is strained; the clear liquid or "wort" being boiled with hops, that communicate a flavour. The liquid is then cooled, transferred to large fermenting vats and yeast is added. The fermentation is partly stopped and it is put into casks; but a slow fermentation follows there.

This beer is a type of corrupted man, who as soon as he begins to *grow* must change and decay. The saturation of the grain with water, is a type of the first stage in corruption after growth. The boiling represents the violent excitements, which draw the substance out of the Man, and prepare him for the reception of external vices.

Lactic acid is the acid of *Sauer-kraut.* Sour milk has to most persons a very unpleasant taste. The "Milk of Human Kindness" turned sour is very disagreeable; it is worse even than the most "sour" natural temper; it begets canker in the Mind.

Alcohol, the active principle of most intoxicating liquors, is the result of the distillation of any fermented infusion in which it is contained. It is a clear, transparent liquid, and is justly called "a spirit," and is by many called an "evil one." It may be acted on by acids, and a substance formed termed ether, which is more volatile than most liquids. Its clear vapour was thought to resemble the fluid or medium, supposed by Sir I. Newton to occupy the space between the atmospheres of the stars. If such "ether" does exist, our home-manufactured ether may be a type of it; as contrasted with the vapour of alcohol, which may represent the atmosphere of the Earth. —We have here "the Spirit and power of the Air."

It is very convenient to acknowledge the existence of a substance like ether, for such a fluid would afford solution for many difficulties, and form bridges over many obstacles. This is what the ether of commerce does, dissolving many alkaloids, many tough gums or slippery oils, and removing them from the pores of what cannot be otherwise "cleared up," even to "microscopic eyes." The number of compounds of ether with acids, and those produced by the action of acids and alkalis or alcohol, are almost endless.

The most important is acetic acid, a product of the oxidization of alcohol. This is vinegar, which is made by carrying fermentation to a final stage with the aid of yeast, or by the destructive distillation of wood. In this way pyroligneous acid is obtained, this contains tar in solution. The action of vinegar on the Human System is that of a slow poison, causing it to shrivel. But its effect on dead substances, is that of an *arrestor* of decay ; hence the keeping-properties of smoked meats, which absorb it from wood-smoke. Vinegar when much used is apt to promote "decline," suitably emblematic of the *latter* stage of one, who has been given over by the Good, and will soon be under the charge of Evil Spirits.

The world has long been full of spirits, of which one of the most famous is the well known "wood-spirit," to be obtained by the distillation of wood, and which may be a type of the Mythology of the Grove. It combines with alkalis, which again found a race of compounds as the "gods" of Greece and Rome did, with the nymphs of the fountains and the fields.

The most celebrated of this offspring, is that famous "deity" of modern pharmacy chloroform, which is obtained by the action of hypochloride of lime on "wood-spirit." By distillation a liquid is obtained, which produces a powerful effect on living bodies, reducing them to a state of coma nearly resembling death. But this is merely temporary ; only to last till a tooth is out or a child born ; at least so it is intended when a "*Post mortem*" is not desired.

Fusel-oil is a very curious liquid, intensely suffocating in its odour. It accompanies the distillation of alcohol, to which it gives a burning, unpleasant taste, strong smell, and unwholesome properties. This substance in alcohol is like the green colour, sometimes added to arsenic to distinguish it from sugar, by housekeepers who do not wish to confuse their poison and their food. Some persons will not have poison separated, from what best indicates its true character.

Oils and fats being highly carbonized bodies, contribute much to supply fuel to the animal and vegetable kingdoms. They are closely allied in both divisions, and eventually in their nourishment of higher animals, perform similar parts. They are divided into two important classes, the Volatile and Fixed-Oils. Namely, those that can be distilled without decomposition, and those which refuse to evaporate, even when exposed to the air for a long period. The "fixed-oils" are subdivided into the *drying* and *non-drying;* that is, those which become resinous by absorption of oxygen ; and those that may become rancid, but never evaporate.

Oils are types of the great "Movers" among men. They are our purgatives, they lubricate our machinery, and promote the more rapid motion of every part. They assist Man's movements; although not the Machinery itself, yet they are the Fuel which supports it. However strong the muscles of a man may be, without a covering of fat he cannot continuously accomplish great things. Some men are of a round shape, and like barrels of oil are thickest in the middle. They greatly abound in fat, and whether found in the pulpit, brew-house, custom-house or public-house, are generally solid and fixed in their dealings. They are like the fixed-oils, "not volatile," and force must be used to remove them from their posts. They are coarse in their gestures, and like these substances, often leave "a stain" on all they touch.

The Fixed-oils contain two or three substances; stearine, margarin and olein. The two first being very solid, are not easily melted; they are highly important however in the manufacture of soap and candles. Olein being fluid at ordinary temperatures, is exceedingly useful for lubricating machinery. These three bodies by their relative properties, illustrate the varied solidity of the "oily" class of individuals, to whom we have just referred.

The olein that gives to oils their fluidity, their smoothness and power of lubrication, exist in varying quantities in different fixed-oils, which we consider typical of the qualities possessed by fat men of diverse nations. Olive oil is the kind of fat most eaten in many parts of the South of Europe, and is thinner and more unctuous, than the "drippings" so much used in the North. But all yield in hardness to the suets of British formation, which are more solid, and more resemble pure stearine, than those which any other country produces.

The prototypes of British suet, are a stout and sensual class of Englishmen, whose very soul is obscured by fat. Such often die from the excessive accumulation of fat in their internal organs, greatly induced by over-indulgence of appetite. Fat individuals both of human and brute lineage, are the most juicy and fleshy, if their fat is not carried to too great an extent. But it is better to see them too thin than overfed; for whenever fat gets beyond control it becomes a great curse.

The olive oil typifies the thinner Italian and French, as the suet does the more stout British farmer. The Italians and French are more vegetarian in their mode of living, and are more refined and pleasant at table.

The more perfect oils, such as the neat's-foot, found in the feet of cattle, and the oil of seals and whales, do not readily separate from the solid constituents they contain. They are a

type of the more refined members of the classes, dependent for their living on agriculture and fishing.

The fixed-oils unite with oxygen, to form margaric, stearic and oleic acids. These combine with "bases," and form compounds of greater or less importance, of which the principal, are the soaps used for removing grease and other impurities. But they do more than cleanse; the free alkali contained in them, partly dissolves the organic substances they touch. Soap is fat rendered soluble, and applicable to the purposes of a detergent.

The "stout" men to whom we refer, have commonly a great deal of physical power, which only requires to be under control, to take a form of great utility. Our stout friend may be useful single, but is a more general "benefit" when married. He thus becomes subdued, which greatly improves him, like the saponified fat.

The drying-oils such as that of linseed, are intermediate in properties between those that are most "fixed," such as olive oil; and those that are "volatile" like the essential oils.

Linseed oil is the principal ingredient in the "polish," by which wood is rendered beautiful and elegant. This art is of foreign extraction, like those processes which commonly give lustre to many of our best materials. But it is now carried to greater perfection in England, than even in the country where it was first adopted. We execute minute details, more thoroughly than most nations. Hence our code of etiquette is strict;—our finishing of many goods not to be excelled;— our "finished gentlemen;"—the FIRST in Europe.

Glycerine is the base of fats, and combines with mineral and vegetable acids, to form artificial fats, not dissimilar to those from which it was originally taken. Glycerine has a sweet flavour, and is a neutral body, having little action on animal and vegetable colours. It does not readily decompose, and is therefore much in request for the preservation of objects from decay. The fats from which it is obtained, are the great shields which protect animal tissues, from the corrosive action of the air.

The sweet glycerine is a type of that good-nature, which is at the bottom of the characters of "our fat friends."

Glycerine when decomposed by the powerful Nitro-Sulphuric acids, forms the highly explosive nitro-glycerine, which is so sensitive, that the least touch from any "hard or sharp body" may cause a "blow up."

Wax is a highly important substance, somewhat allied to fats and like them consisting of several distinct principles, which with alkalis form soaps. The most abundant ingredient in wax

is cerin. Wax burns better than the fatty-acids, and is tougher, more tenacious and sticky. Its agglutinating properties are turned to account, by those who wish to give firmness and solidity, to fibres of a loose character. Typical of the assistance and friendly *twist*, our weak, loose friends, get by external pressure. They then acquire a nerve and power they had not before. Some individuals have little ability to resist force; unless under the influence of some strong stimulus or passion; which as it were "screws up their courage," to a point foreign to their nature.

Benzine or benzole is condensed bicarburet of hydrogen; such as is obtained by the destructive distillation of coal. It is poisonous, and yields a variety of compounds, some of which are deadly, but others like benzoic acid, may be taken by man in considerable quantities with impunity. This beautiful, white salt, may be volatilized and condensed, so as to rise in vapour, and fall like a shower of snow. When gum benzoin,—its principal source is heated, benzoic acid escapes from the earthy-ingredients with which it is mixed. It ascends to Heaven as it were, to be purified, that it may descend pure to Earth. Gum benzoin as the probable "onycha" of Scripture, played an important part in the incense of early Iraelitish worship.

The hydruret of benzoyl, or essential oil of bitter almonds, is frequently mixed with prussic acid; which is not necessary to its flavouring properties, and may be easily removed by the protochloride of iron. Prussic acid when concentrated, is a most deadly substance in its effects on organic life; causing large animals to fall dead, on swallowing but a few drops.

Prussic acid is a type of those evil agents that obstruct ventilation; that adulterate food; that dig cesspools; that turn "rivers of life clear as crystal," into drains of muddy filth, that poison and destroy those living near them, or in them.

Iron is the great remedy or antidote for prussic acid as for arsenic; but the acid is so rapid in its effects on the human body, that it is often too late to apply any remedy. Iron is the great dividing agent; the great ROD which will hereafter rule evil influences and render them harmless. This acid with potash and iron, forms "Prussian-blue," which according to some chemists gives the blue colour to steel; which is believed also to give many of its valuable properties to the deadly cyanogen. The blue tint of heaven when brought down to steel, is illustrative of the operation of severe and constant rule, through instruments of the hardest metal.

The vegetable-acids so abundant in the fruits, stalks and roots of plants, mostly if not all, contain water as part of their constitution. The principal of this class of sub-

stances is tartaric acid, which gives the sour taste to grapes, tamarinds, and pine-apples. This substance is exclusively obtained in commerce, from that tartar which is precipitated on the fermentation of grape-juice. This crude-tartar, contains tartrate of lime, as well as bitartrate of potassa. The "cream of tartar" is its most common preparation. This crude-tartar has some resemblance to the "tartar" of our teeth. They are both rich in calcareous matter; and are found abundantly in all countries, especially in wine-growing districts, including Tartary. The inhabitants of that country are both sharp and sour, like the substance; hence we say, "Catch a Tartar."

Citric is the acid of lemons, and the salt that gives to the smallest fruits of the lemon-family, that acid juice, which the bark and leaves of the parent tree do not possess. This acid is "essentially" the salt of lemons.

Malic is the acid of apples and pears, giving to them a great part of their pleasant flavour. Its solution easily decomposes, and forms a resting-place for mould. When apples or pears are cut, they in a few minutes become brownish, and the juice stains calico with the same tint. They are among the choicest of earth's fruits, and retain their flavour longer than most others, if the integrity of their rind is preserved.

They are a type of favoured races, long enjoying prosperity; but whose fall is only the more complete when their borders are successfully invaded.

Tannic acid, imparts a high degree of bitterness to tea, oak-bark and galls. It is of great importance to society, being necessary to the tanning process by which the skins of animals lose their stiff, rigid gelatine, and become leather, flexible and little apt to decompose. Tanning is a long and tedious process, which would be trying to anything but leather.

It reminds us of the course of training man undergoes, by which all that is stiff and rigid in his compositon is precipitated. He is then fit for a useful life; being flexible yet tough; yielding,—yet wearing well. A skin like leather, with muscles like leather, are generally found on persons of this character of life and mind. They are not much affected by difficulties or disappointments. They are not torn or rendered useless by them, but are commonly unpolished. Of late years leather has been enamelled, which is known by the name of "the patent." This however will not stretch like the old leather, although it is more glossy and finished in appearance. Dust does not adhere to it as to common leather, but still it is apt to split and lose its lustre by a little abrasion.

Common leather is a type of the rough countryman, who can be turned to so many purposes, and who is but little inclined

to become "cracked," but may do so more readily if he becomes "more polished." The rough untanned hide soon decays, as the man does when placed without previous training in trying circumstances.

The organic-bases, are those substances which comport themselves like alkalis or bases, without containing a portion of alkali from the Mineral Kingdom. Some few are of animal, but the greater part are of vegetable origin. They are the representatives of the more powerful qualities of their sources: hence in the Botanical Firm they should be called "The active principles." They have a less strong basic-action than their analogues in the mineral division; but this comparative weakness, is compensated for, by the immensely powerful action they have on the animal economy. They are mostly acrid and bitter; and are but sparingly soluble in water. Alcohol and ether form their best solvents; sufficiently significant of the way, in which a person may be intoxicated and poisoned at the same time.

The most important of these Active-principles, are the cinchonine and quinine, to which the Peruvian-barks, those most valuable medicinal agents, owe their febrifuge qualities.

These substances are types of trials, whose action is healthy, not cankerous; which enlarge the desires; tend to stir the veins, and to infuse into the man, a spirit of vigour and healthy action. The effect of quinine as a stimulant and astringent, is in some cases too violent. It exercises too conservative an influence on the system, stopping "free trade;" "closing the ports;" and reducing the whole frame to a "State of Blockade."

Morphine is one of the most important alkaloids derived from opium. Its various salts are commonly used as narcotics for causing unnatural sleep to deaden pain; or to produce unconsciousness when operations are proceeded with. The malefactor avails himself of the properties of this substance, when he desires to render his victim unconscious of a robbery. The effect in a moderate dose is merely temporary. The happy unconsciousness of passing events, lasts but a short time. The mind awakes to misery, or physical depression, greater than before the dose was taken. Repetition only increases the gloom, when its immediate influence is over.

The effect of narcotics is stimulant or sedative, in proportion to the dose and other attendant circumstances:—A type of artificial life;—life opposed to the Natural laws which God has appointed. It is sought to stimulate at wrong times; which must involve an abnormal period of rest, from this unnatural excitement.

A great number of alkaloids exist in the tissues of plants; some of which possess more poisonous properties than are to be

found elsewhere. From being unstable in their constitution, they cannot be detected in the tissues of those animals killed by them, with the same facility as the less subtile, but more dense and simple mineral poisons. These Inorganic compounds, are more powerful chemically as regards "basic" or corrosive action; but they do not produce the same thrilling effect on living organisms. They do not like these Organic compounds course through the veins, and reduce a living man to a carcase, in an electric manner. The mineral poisons, effect as it were the disintegration of his frame, which falls to pieces as surely as it is undermined. But the organic poisons, stop the very centre of life, with a sudden suffocating grasp, like that of a giant's ghost. They pass away, and leave in some cases nothing but their effects.

If the influence of the inorganic poisons is a type of physical degeneracy and corruption; so the action of the organic poisons, roughly speaking, is an illustration of Moral and Intellectual pollution. This cannot be so easily traced, owing to its insinuating character; but is seen in its effects even to the most superficial eye.

Aconitine derived from the *Aconitum napellus*, is a glassy, crystalline substance, a fraction of a grain of which when swallowed, will reduce a strong man to the grave. Atropine from Belladonna, is almost as virulent in its effects; as is also strychnine from Nux vomica. The conine from hemlock, and the nicotine from tobacco, are oily bases, which with acids form crystalline salts, that are not behind any substances known, in actively poisonous properties.

The Organic-bases are far more numerous than the inorganic. If the Inorganic-bases, roughly represent those binary-qualities, which we see in the mental constitution of man; so do the Organic-bases, represent by their more complex character, and still more varied properties, the compound and dubious constitution of his Motives and Actions. Some are comparatively harmless, while others are hurtful; and all are productive of more or less important results.

Tens of thousands of bodies are formed artificially, and many others occur in nature. When we consider the amount of compound bodies known, and of those that are every year discovered; we find a number, probably sufficient to illustrate every variety of human compound quality, as forcibly as the *chemical* elements, illustrate the primitive qualities of the mind. It is probable that substances exist, and are known; or will be discovered, answering to the character of every individual that has ever lived, or ever will live hereafter. Substances as Individuals, are not identical, though similar in properties, and we

class them as Races, Metals, Solids, Fluids, Irritable, Stable or the reverse, and Acid or Alkaline.

The Organic-colouring matters or principles; the natural and artificial dyes, which give to most tissues their tints; are generally believed to be illustrative, of that "colouring" or "change of complexion," which the minds of men give to the subjects they treat of.—We shall endeavour to show this relation in some detail.

One of the most important of organic-colouring matters is indigo, a blue substance, formed during the fermentation of certain tropical plants. But it may be considered as a not unfrequent accompaniment of organic decomposition. Indigo is very permanent as a dye for textile fabrics; and may be volatilized and crystallized. There was for a long period a prejudice against its use; for it was called "one of the devil's dyes." But now it has taken the place of "woad" among the Britons, and serves to stain the blue clothes which the butchers, the representatives of our so-called "cannibal ancestors," still wear, as the livery of, and best contrast to a sanguinary occupation.

It is difficult to destroy the colour of indigo, except by very powerful chemical agents, some of which only suspend its colour, changing it for the time to white or "reduced indigo." It is then easier of application to fabrics than in its original state, and when exposed to the air, it absorbs oxygen, returns to its blue colour, and clings with obstinate tenacity to Organic substances. Secondary means in chemistry often effect ends, quite insurmountable by direct combination. When substances are in what is called "a nascent state;" that is when they are *first* separated from their old combinations; they often unite, with what they had previously no affinity.

They resemble those persons, long under the control of strict governing principles, which have kept them from forming improper connexions. But when the restraints are removed, they contract alliances that have been hitherto considered monstrous.

Another important blue colouring-matter is litmus, produced during the fermentation of lichens; as also archil and cudbear; which are of little permanency, compared with the aniline dyes of purer hue. Litmus is so sensitive to the action of acids, that it is the principal test for them. Paper dipped in its solution, turns from blue to *red*, in contact with the weakest soluble acids; and again from red to *blue* on the addition of alkalis.

This sensitiveness is typical of the degree of constancy, practised by the rulers of Great Britain. The violet colour of litmus is typical of Empire. We have said that acids turn this substance red, and alkalis cause it to return to its blue state.

These transformations are illustrative of those of governments, who change from "true blues" to "reds;" and from *police* to Military, in time of riot; to return to Police again when the disturbance is over. But permanent rule is not liable "to change its complexion." It will not be "the sport of parties," but will be little changed by the utmost efforts of their venom;—like the aniline hues, by the acids and alkalis of the chemist.

Cochineal (*Coccus cacti*) is a little insect feeding on the leaves of the large Indian figs. The bodies of these insects when dry, yield to water and alcohol, a brilliant carmine colour, which is the precipitate when alumina is added.

This carmine is a favourite colour, with miniature and flower painters, who wish to represent nature. And with those "faded flowers" among the Human species, who desire to imitate the bloom of "budding life." This is the principal ingredient in "*rouge*." The *noir* follows when the "*rouge*" is off; therefore this is "*a losing game*" as regards the successful counterfeit of beauty. Carmine like the hue of most flowers, fades when exposed to the air and light, as do those, who resort to abnormal means of beautifying the complexion. These live too artificially to possess what God intended,—a "Bloom of spring" in Youth, and a Frost-bitten bloom in Autumn.

Aniline and its various combinations, have in this age, produced hues and tints, far surpassing any formerly applicable to textile-fabrics. Aniline is made by heating phenyl-alcohol: or from nitro-benzole by the action of other substances. It consists greatly of carbon; but contains hydrogen and nitrogen. Yet these brilliant tints, are the products of the action on it of oxidizing-agents. Substances rich in carbon are more permanent in their constitution than other bodies; pure carbon being the most stable of all the non-metallic elements, and only exceeded in this respect by the nobler-metals.

The diamond is the hardest and most brilliant of precious stones. It consists of pure carbon; but it is carbon in its most pleasing and agreeable form. The element shines here, and attains its utmost loftiness of position; none is so much prized as it is in this state. The "diamond type," as well as the largest productions in printer's ink, owe their permanence to CARBON.

Many of the preparations of aniline, are exceedingly permanent, and yield but little to the brightest sunlight. Colours that cannot stand the light are not entitled to the first place. The fashionable colour *mauve* and its various shades, is obtained by a complicated process from the sulphate of aniline. It gives to wool and silk, tints unequalled for purity and brilliancy, in ancient or modern times.

Most shades of purple, derived from other sources are un-

stable as dyes; but this is one of the most enduring of colours. The Purple of Tyre,—dull compared with this hue, was scantily distributed, and was scarcely as permanent. It was but the blood of a whelk, and has passed away from general use, in preparation for a brighter hue. But our modern purple is a manufactured article; one of the most refined products of the present advanced state of chemical art.

The appearance of these aniline dyes at this Age of the World is significant; as casting pure and magnificent hues in which to robe "Old Father Time," in the days of his age and infirmity, they being bright in proportion as his flesh is withered. But his yellow and corpse-like skin is only dimly hid by the gaudy tints. Yet these brilliant hues typify more than that brightness which some try to cast around decay; they shine from out a black dull and pestiferous medium such as coal-tar. THEY SHADOW THE RISE OF AN IRIDESCENT PHŒNIX FROM THE FIRE. The diamond sparkles and illuminates, and the soot dulls and deadens what is near; and yet they are both the same substance, but have passed into different forms.

The purple-mauve is an emblem of a pure and permanent rule; and like the rose-aniline or magenta, which in the form of an acetate or chloride, gives to wool the tints of venous and arterial-blood, is a suitable type of the slaughter, that will accompany the advent of Universal Empire.

The pure yellow or chrysaniline, and the aniline-blue, illustrate the glorious and constant characters of this rule; these colours being purer and more enduring, than the delicate shades in former use.

The Volatile-oils when pure are colourless, but easily take tints from those substances, with which they come in contact. They do not form soaps with alkalis; and possess a pungent taste and powerful odour. They are the principal perfumers of the age and are mostly vegetable. They are greasy to the touch, but the stain evaporates either spontaneously or on the application of slight heat.

If the Fixed-oils are the types of our "stout friends," who refuse to move even when their seat is made *hot*;* the Volatile are of the more sensitive and delicate "of the family," some of whom by their rapid motions, pungency of spirit and penetration may influence "a large circle." But the essential oils in general, typify a class of persons, far "too volatile" to accomplish much of a useful kind. They are great friends to the perfumer and give scent to the ladies or "flowers" of society; but they do not, like "the stout men" give the right arm to progress.

* In chemical works the student is advised to drop any Fixed-oil on paper, and apply heat *below*, thereby to prove that it will not evaporate even when well warmed.

The essential oils are in great variety, but the most abundant is the oil of turpentine the product of the fir-tree. The balsams that exude from trees, are solutions of resin and volatile oil. The oil evaporates, and leaves the resin, a hard sticky substance; or by absorbing oxygen itself, it is converted entirely into resin. Turpentine is a bitter substance, highly explosive and very difficult to extinguish when once inflamed.

It is a type of a comparatively "volatile" person, but one who is apt to "stick to what he touches." The dry fellow diffuses around him an atmosphere of drought and dullness; but on the contrary the "volatile" man, attracts to himself what is lively, to cheer himself and others. Such a man is also somewhat like turpentine in being of a "detonating" temper. The Spaniards say, "*Muger negra trementina en ella*,"—"A black woman has turpentine in her;"—that is to say she has part of the pungent, spirited, "volatile" qualities, which turpentine has. This does not refer to a Negress; but merely to a black-haired and dark-complexioned woman of European descent; who is apt to be more "spirited" and "fiery," than one with flaxen hair.

Turpentine and most Volatile-oils, dissolve resin and Fixed-oils with facility. An application suggestive of one of the chief uses of our "volatile friends," in assisting to rid us of "our fixed oily ones," when they become troublesome.

The oils of lemon-peel, orange-peel, juniper and pepper are important as flavourers. They serve as useful condiments, as perfumes to render rank, Fixed-oils, palatable for the table, or agreeable for the toilet. They are like the lackeys, the serving men and cooks, that "dance attendance" on "our fat friends."

These essential-oils enumerated, contain no oxygen unless hydrated, and are not our choicest perfumes; for it is a necessary ingredient to a good perfume. A very large number of volatile-oils, contain two or three substances, in which they show analogy to the fixed-oils. The oil of anise-seed, an example of the series which contains oxygen, consists of a solid and a fluid oil, as does oil of thyme, rue and cedar-wood.

Camphor resembles the solid portion of a volatile oil, and is a remarkable substance; for when oxygenized by that powerful agent nitric acid, it yields an acid like many organic substances. It is a strong, conservative agent, and like all such is powerful as a destroyer. Its fumes are fatal to animal life if much inhaled; and it produces violent convulsions if taken in a large dose.

It is greatly used for guarding furs and wool, against the attacks of moths and beetles.

Camphor is the Oriental slave, who has charge of our ward-

robe; but who may, if not kept in his place,—"take us off by poison." He may like this substance be thought harmless, and allowed to rub our teeth when we are ignorant of the possibility of his putting a poison into our system, that may at least promote its decay.

The oils of peppermint, orange-flowers, lavender, rosemary and otto of rose, are amongst the choicest of perfuming agents. Odours are eminently typical. They are minute particles of dust or volatile substances, wafted by currents of air. They are of various kinds, for most bodies have a distinctive scent when pure, perceptible to ordinary noses. But every known substance has doubtless an odour which would distinguish it from others, were our senses sufficiently acute and uncontaminated.

Agreeable perfumes rising in wreaths and borne on breezes to the open doors of the nose, refreshing and inspiring; remind us of good, profitable and healthy emotions and desires;—Perfume to the Soul. But the balance must be maintained in the action of our faculties, as in the mixing of perfume-oils, or the result is less agreeable. Many that in a pure and undiluted state, are in the highest degree nauseous; are when diluted, or modified by other ingredients, the most delightful we can enjoy.

A good combination in perfume, is a type of well-ordered Mental emotions. Contrast these with bad scents and their analogues, foul and filthy actions.

The fragrant oils and essences, represent Moral virtues, or what is charming and pleasant in life. The lavender that stands for Modesty; can be endured, and is even agreeable in a large dose. Rosemary may represent Prudery, which is well in its place, but should not be used singly, when wedded to "old time;"—a common combination in an atmosphere of prudes. The principal perfumes in "a wash to keep the hair from turning grey;" are oil of rosemary and old oil of thyme. But these should have an addition of the oil of orange-flowers, or the scent is not commonly popular.

The orange-flowers which ornament the bride, diffuse around her, the sweet fragrance of a bright entrance on a new position. While the otto of rose, so agreeable by itself, is a type of that pure love, which forms "rose-sprays" through every passage of life. The rose so generally acceptable, is so in all stages; and has always been the poet's friend.

The essential oils containing sulphur, produce on us a less pleasant impression than the perfume oils; yet are useful flavouring agents. The oil of black mustard contains sulphur, but no health-inspiring oxygen. Mustard-seed is only hot and

purgent when wet, for the oil which occasions this flavour is formed by the action of water.

All sulphurous substances remind us of evil agencies. King James I. proposed if he ever entertained "his Satanic majesty," to set before him "a dish of mustard with a pipe of tobacco as digester."* This was appropriate when we consider that mustard owes its flavour to a sulphurous oil.

Mustard by its pungency, and the heat it excites in our mouths, or on our skin, reminds us of the satirical Reviewer, who is a useful flavourer of a dulcet age; and who serves to infuse spice into what is insipid in literature. Too much sharpness in a composition, irritates the Mind, as too much mustard in a plaster, vesicates the skin; and occasions a sore that does not easily heal. A sufficient quantity of satire promotes "a glow," which relieves the cold, chilly feeling, caught by reading a dull composition.

The oils of garlic, assafœtida, and onions, are rank, nauseous substances, except in minute doses. Assafœtida is in Britain exclusively used as a medicinal agent, but in some districts in the East, it is said to be a substitute for garlic in flavouring.

The anti-magnetic property, attributed to the juice of onions, is perhaps owing to the sulphur contained in the oil, corroding the steel of the magnet. These oils dissolve sulphur and phosphorus, and are types of sharp, cutting agents, which display much heat, vigour and pungency.

The oil of garlic is a type of the sharp provincial editor, who displays so strong a flavour of "Kitchen literature." Scents of this kind once acquired, are not easily lost; they haunt a writer as long as he lives, and are only harmonious with the low, rank odours of Society.

Resin consists of two or three acids, which form with alkalis, soaps analogous to those of fat oils. The most valuable of resins is the lac; an important ingredient in sealing-wax and varnishes. It is affected by few acids, but dissolves in volatile oils, alcohols and ethers. Lac is brought from Malacca and other regions of the Indian Archipelago. It is an ingredient in the foreign varnish, so extensively given to articles of home production, to give them an air of what is exotic or costly. Thus filthy rags are purified and made up into paper; and paper into tea-trays, which are coated with lac-varnish, to imitate the productions of Japan; and articles of metal are lacquered over to prevent oxidization, and give them a gloss and a glitter not their own.

The different hard resins, such as copal, mastich and sandarac, when dissolved in spirit, form varnishes of greater or less

* *Vide* "Counterblast of Tobacco."

value, which with their applications, come from different parts of the world.

The old-fashioned method of rubbing furniture with linseed oil, may be called English, or at any rate characteristic of northern nations. It is hard rubbing; typical of the hard work formerly required in finishing ornamental articles. But now "science and art, have made great strides;" especially that connecting link between them, "technology;" by which the sublimities of the laboratory, are applied to daily life.

In the process of varnishing, or coating with gums derived from the Orient and South, we see the attempt to diffuse around our furniture, the glow and gleam of sunny lands. A coat of varnish fills up those pores in wood, which would otherwise afford lodgment for "the dust of ages," and enable them better to defy "the march of time," and to carry down the lustre of the past into the present.

Dragon's-blood has a very suspicious name among the resins. It is a common stain amongst furniture-makers, to give to light-coloured woods the hue of mahogany. The name and properties of this substance, are significant of fraud. A great imposture will be practised, on those stained with the blood of The great Dragon.

The process of staining and painting woods, is also highly characteristic of an age, in which "adultery" and "adulteration" are practised to a great extent; particularly the last, which is a thoroughly English vice. This is much fostered by "John Bull;" who though generally beyond other countries in honesty; yet Here, prefers "to say one thing and do another." He must have his wood *stained*, his plaster gilt, and hues foreign to substances imparted, if he would please himself. A characteristic which goes further in the Moral world. Man calls things by their wrong names, gives to what is base and vicious, the lustre, the varnish and the gilding of virtue.

Caoutchouc or Indian rubber, is a very permanent compound, consisting of two pure Hydro-carbons united. Gases are the only perfectly elastic bodies, and these solid Hydro-carbons, resemble "condensed gases," and doubtless owe their elasticity to this cause. It is a most wonderful substance, and its applications are almost endless. So very few chemicals affect it, that it may be used for conveying them *unchanged*. It repels water, and its thinnest film, will exclude either this liquid or air.

This is a type of something surely very wrong; and so completely out of order, as neither "to bear ventilation" nor water. If gases are the emblems of Spiritual agencies, these solid gases are of their application as lever powers, amongst those solid living bodies, whose presence is evident to our senses.

The remains of extinct organisms, are a great source of the carbon available for man's use. To these we must add the vast quantities supplied by bodies recently decomposed. Carbon has less to do with the Inorganic Empire, than with the Organic. And it is a question whether on the original formation of *frames and cases for life*, this element was not largely created. For the sources of its existence in the earliest rocks, are not sufficient to account for the immense masses contained in Organic remains.

In the first chapter of this section, carbon was described as not active, but as the basis of combustion, holding a place in Nature, similar to that of the faculty of Eventuality in the mind. Carbon is the great illuminator and warmer on Earth. It is a type of life, which is also illustrated in the remainder of the Elements, in its other characters.

But we have now to deal, with a most complex series of natural and artificial operations; namely the destructive distillation, and slow changes, which Organic substances undergo. Tar is one of the most important of the gross products, of the destructive distillation of organic matter. When wood is put into a retort and heated to a high temperature it yields tar among other substances, which is usually condensed in the receiver. The tar of the wood-vinegar maker is mostly procured from dry beech-wood.

The appellation "Tar," is applied to seamen probably because they are coarse, rude "bodies," and possess a variety of qualities, good and bad; but all characteristic of "ship-board."

The substances obtained from coal-tar are very various, some being solid and others unctuous to the touch. These different constituents, may illustrate the varied characters of sailors.

Benzine or benzole, is one of the volatile constituents of tars and their oils; from which it is obtained by careful distillation. It is the great solvent for grease, now in vogue; being one of the few substances that will move fats, when they have settled in awkward places; which may be *couleur de rose*, or the most delicate hues, which the warm sun, has called forth brightly and happily. But this benzine only appears to brighten these roseate and evanescent tints:—it evaporates and leaves a clean field more lovely than before.

Having considered the "Chemical Elements" and their combinations as illustrative of the Mental faculties, Emotions of Man and his Traits of character; let us consider in conclusion, how far the chemical processes illustrate Mental Operations; by which what is external to the mind is received into it.

The foundation of chemical knowledge, is based on *analysis*,

as is our consideration of mind, and its exercise and its results. We divide chemical analysis into two sections: the Inorganic and the Organic. The first, consisting of the elements of which the whole is composed, shows analogy with the Primitive Faculties of the Mind. The second, the complex Organic section of chemistry, shows resemblance to the complex, and highly compound character of Motives and Actions in Man; based as they are, on such a variety of compound elements.

Let us consider the different processes, by which these results are brought about; and compare Chemical and Mental analysis; —that is to say Analysis by the Mind. Both of these operations may be called "*Testing;*" a process by which the truth is supposed to be extracted.

The first reception of any external impression into the Mind, may be termed "absorption." This is analogous in chemistry, to the *acquisition* of the substance to be analyzed. The next step is "*digestion*" in both sciences. In chemistry, substances of a foreign or extraneous character are removed by "sifting" or "filtration." And in the analysis by Mind, a similar process is pursued; both are then fit for general "diffusion," without confusion. They are then not precipitated or thrown down, by their own "dead weight."

During the analysis of a subject or substance, it is necessary to keep it under control; lest it should fly off, or alter its character by "effervescence:" or become dry and uninteresting by "efflorescence." For it should retain its "crystalline or characteristic form," even after that refined process of analysis, "distillation." These different operations are all performed by Man. His emotions, his feelings and passions, all undergo processes, analogous to these chemical processes. These are performed on every emotion or feeling, independent of its character or nature. Just as every substance poisonous or wholesome, must pass alike through every chemical operation.

These processes appear to be recapitulated backwards and forwards during the extraction of truth, which like a subtile substance in chemical analysis, may easily elude the operator's grasp. It is seldom *pure*, but is mostly "adulterated" in the Mind. It passes through many torturing processes;—it is "sublimed" to the heights;—it is "precipitated" to the depths. It is "distilled" to remove it from earthy impurities; the very "spirit of envy" itself may be *sublimed* in a *retort.*

Truth will often "crystallize" and reflect prismatic hues; but it is *unstable* on Earth, like the salt that "deliquesces" in the mist, and "effloresces" in the sun. In "a state of solution," its form is lost, and it absorbs earthy impurities, to remove which it must be again "filtered." It is at last made clear, but requires

to be concentrated and finally "fused," which *unites* the hitherto scattered fragments.

All these processes are but those of "assaying." Not as exclusively applied to Metals, but to things in general, by which what is good and precious, is proved and separated, and what is valueless removed.

CHAPTER XVI.

THE MORAL PHILOSOPHY OF LIGHT.

LIGHT THE PRODUCT OF CHEMICAL ACTION—THEORY OF LIGHT—MORAL SIGNIFICANCE OF COLOURS—ABSORPTION OF LIGHT—ITS INTENSITY—VELOCITY—REFLECTION AND REFRACTION—THE EYE AND ITS VISION—PRE-RAPHAELITEISM—BINOCULAR-VISION—MICROSCOPE—CAMERA-OBSCURA—PRISM—SPECTROSCOPE—THE SEVEN SPIRITS OF LIGHT—POLARIZATION.

THERE is every reason to believe that Light is in most instances, if not in all, the product of chemical action, at a more or less remote date. By chemical action, we mean the action and re-action on one another, of Elementary bodies and their combinations. The light of the sun of our solar system, is the principal illuminator of the Earth. The sun was accepted by many of the ancients as the Deity, probably at first, from his being a type of the Creator and Enlightener of the World. The earth and its kindred planetary bodies revolve round *a sun*, the type of the Son of God; while beyond "our solar system" is probably a larger and more Universal System; vaster, more inclusive and holding within it our sun and all its numerous planets. The centre of this system is as yet beyond our ken; it is the type of the THRONE OF THE SUPREME, round which all creation revolves. This throne is superior, more exalted and universal, than the Throne of the "Son of Man." That such a centre of creation does exist, is probable in a degree approaching to certainty, and is in harmony with the "discoverable and the revealed."

This Chemical Action which we think the source of light—the result of elementary or compound elementary re-action, is highly typical. Physical light is the type of Instinctive, Intellectual, Moral and Spiritual light; and the chemical elements which produce light, are the type of the means by which this living light, illuminates sentient beings. The theory propounded by Sir Isaac Newton of light being *emitted* by bodies, and of its passing directly itself to the retina of the eye; has to be contrasted with the theory of *undulation*, by which light is supposed to vibrate like sound, in consequence of excitement

instigated by the illuminator. Both theories are probably true to a certain extent. The first being made the basis; while the "undulatory" process, where it occurs, must be referred to mediums through which light passes, absorbing it irregularly, or in different degrees, which would however be included in the great theory of "Emission."

Moral light comes directly from "the Son of God," who is the *Illuminator;* and through the different ages that are passed since the commencement of "Revelation," waves of light have flowed onward. As physical light is seen to be composed of three elements, when viewed through a prism,—a three sided figure,—a tri-unity; and by this is analyzed and better understood; so in theology the doctrine of The Trinity—Tri-unity—renders intelligible to us much that is otherwise inexplicable in the Highest order of Knowledge. If it is the highest principle in theology that reconciles "unity and diversity" in Unity and Trinity; one of the most important facts in Physics, is that white light consists of THREE coloured elements. These colours have a moral significance, which typify the attributes of Deity. They are red, blue and yellow. Red is the most warm, stimulating and heat absorbing colour, and typifies Judgment and the exercise of power generally. Blue indicates constancy, fixity and Eternity; while yellow being the most luminous, typifies the enlightening influence. These show analogy with the characteristics of the "Three Persons in the Trinity."

The colorization of objects is in proportion to their texture as absorbing mediums; that is to say these textures cause them to decompose solar light, and absorb the requisite colours from it. These different hues are typical of different views in theology, which are received diversely by different minds, according to their character. The "immense variety of shades of opinion," are continually contrasted with *shades* of colour. Superficial writers mention colours "existing in art, that are unknown in nature," which would be impossible if we consider colour in objects, due to the absorption of particular rays of light.

The absorption of light, is in proportion to the character of the *medium* through which it passes: relative transparency is the index of this. The atmosphere which surrounds the earth, possesses different degrees of transparency, varying with region, elevation and season. All these more or less, affect the passage of light; as Moral elements do the light that is not physical.

The concentration of rays of light in physics as in ethics, requires a "focus," which is the point of greatest intensity or illumination; yet this is but a small part of "the pencil of light." The Great Moral Illuminator of the world, like the great

physical illuminator, diffuses light *unequally*. Certain portions; being lit more or less brightly, as in the outside lines of "the pencil:" while at the focus, it appears like a dazzling star. The "Star of Bethlehem," was but the focus of a much larger stream of light, soon to illuminate the East.

Light is said "to flow at right angles." We cannot view it through a bent tube of any considerable length, except with the aid of reflectors. Moral light is always direct, never oblique in its descent from above, but "a Moses" may reflect in his face a brighter light, than that of which he is the medium. No light intercepted is satisfactory as a guide. It may prevent total obscurity, but is not to be trusted like that which, comes directly from an object.

The intensity of light like the influence of attraction "is inversely as the squares of the distance," which is true also in Morals. For Nations, as individuals, receive their illumination greatly in proportion to the distance from their illuminator. The nearer an object is to the illuminator, the more intensely it is lighted. Light may either be diffused or concentrated. The same amount of light will brilliantly illuminate a small body, placed at a short distance from it, or a body four times the size in a less degree at double the distance. In the "Moral world," those who are nearest the source of light, receive the light in a more concentrated form, but it is more diffused when absorbed by those, at a greater distance.

The velocity of light is said to be 200,000 miles in a second, which for short distances is instantaneous. Heavenly messengers, move at a rate, which is probably inconceivably fast for short distances. Those who Spiritually, approximate to the source of light, receive it without any apparent break; they are filled with it, in proportion as they approach it, until they so vividly reflect it that they not merely appear filled with it themselves, but are capable of diffusing it to others. The solar system comes in here to assist us by analogy. The sun is the principal source of light, without which all the planets would be dark. But as long as this influence is maintained, they are illuminated, and give light on the Earth.

The reflection of light is called "Catoptrics." Every substance on which light falls, is more or less of a reflector. Glass coated with tinfoil and mercury, or a polished surface of silver or speculum metal, or the surface of a liquid, are all "good reflectors." While lamp black; black velvet; or charcoal, are amongst the "worst reflecting" substances: being at the same time the most difficult to illuminate. These "good and bad reflectors of light" physically, illustrate the same Morally. Some individuals give forth much of the light communicated to

them, while on others it is to a great extent lost. White races, and light-coloured races, throw off much more light than black ones. Morality is greatly in proportion to hue. The Xanthous-haired Races are lightest, casting forth most "reflected light." The Yellow-skinned Races such as the Chinese, "reflect many rays of light," but not so many as the Xanthous-haired; while the Black Races, as yet "absorb" much light, but "reflect" hardly any. They do not "absorb light" in the same way as the White Races, that is to say so great a "variety of rays,"—analogous to their inferior Moral status.

Reflection is of Two kinds. The light in the first kind is thrown forwards, and in all directions, and is illustrated by the reflection, and subsequent diffusion of the sun's light, over surrounding objects, with the aid of the Earth's atmosphere. The second mode of reflection, is that of light in one direction, as from an opaque mirror. This "diffused reflection of light," is typical of the Universal diffusion of Knowledge more or less bright, according as it is reflected again from "the surrounding atmosphere:" while the second or mirror reflection, illustrates that from a confined centre.

Opaque objects intercept light if placed at a certain distance therefrom, and may be thus the means of hiding light, from objects much larger than themselves, but at a greater distance from the source of light. This reminds us, as has often been previously remarked, of small people and small teachers. Of priests and other "middlemen;" of "go-betweens" in general, who very often, although insignificant in themselves, yet, get into a position which is obstructive to the enjoyment and enlightenment, of other beings. How different is this from "reflection:" but their very obstructing influences, while they *hide light from some*, reflect light on others, which finds its analogy in a busy class, who would fain hinder the world from being "enlightened," EXCEPT BY THEM. They are "dark and obscure" to all but "a select few."

The same facts in Optics as in physics, have many different aspects, and each aspect has its special analogue in Morals. Concentration is necessary to success in a particular direction, but such narrows the application of force. If the mirror, an opaque, highly polished, reflecting body, illustrates this in physics, in human character it would be exemplified in the man devoted to success in a particular direction. "He reflects much light," and "throws off much light," but the angle of its influence is narrow. It is like physical light; which is enlarged in the convex, and contracted in the concave mirror.

Images may be multiplied to an almost indefinite extent, by mirrors suitably placed. The Kaleidoscope illustrates this

principle: a confused *mélange* is, by mere regular multiplications, reduced to order. What is chaotic and fragmentary, becomes geometrical and harmonious. A superficial view of physics, or a narrow angle of the Earth's circle, may show *disorder;* but "the union" of apparently incongruous corners, results in a Harmonious Whole.

Refraction is a deviation in the angle, from the "Normal angle," when light passes through a medium. This angle of deviation, may be measured like every other angle, in degrees, which differ, according to the form and character of the medium. Refraction assists in the diffusion of light, it renders objects visible out of the straight line of vision. The sun's light, by a refracting atmosphere, illumines a section of the Earth. The sun's image is sometimes actually visible, when we know it is below the horizon. The sun has set; but still its light illumines the horizon with glowing beams, which tell of glorious day passing, like the "brightest page of a nation's history." Long after the nation itself has ceased to exist "a refracted light" tells its story.

History is "refracted light;" through its aid we see an image of past days. To the historian the image is vivid, and sometimes is almost as clear as the reality itself. Optical distortions by refraction, as in the phenomenon of "mock-suns," occur. Thus the sky is illuminated by circles and semi-circles of light, which are larger, but much more indistinct than the great luminary. These "mock-suns," are types of images which the historian, conjures up of remote periods. He exaggerates the proportions of the objects he describes, so as to give them the appearance of being, notwithstanding surrounding gloom, of far larger size, than the *great illuminators* of the historian's *own day.*

The refraction at two surfaces, is illustrated by the passage of light, through that well-known class of objects called "lenses," which may be formed of any transparent substance. The object of lenses is to control the passage of light. The Human eye contains lenses, which are analogous to those used by the Optician. As it is through the eye that we can alone use optical instruments, we will take it as a basis in our Moral treatment of Vision. The eye is a mere optical instrument, like the telescope or microscope, through which apprehension comes of visible objects. The mind views them on the retina, through some mysterious process Unknown. The "mind's eye" is a hackneyed expression: for physical vision has long been held to typify mental vision. We shall endeavour to treat the subject analogically more in detail than has perhaps hitherto been done.

The eye possesses all the mechanical appliances, of a perfect

optical instrument. It has an outside case with "cap or cover;" —the socket and eyelids; while the different coats may represent "the tube" of the microscope or telescope. There is a crystalline lens; there is an iris which answers the purpose of a diaphragm; there is an aqueous humour which answers to "the first lens" of a telescope; while the second or "crystalline lens," is a double convex, a little flattened in front, as the aqueous humour is behind; all precisely analogous to an optical instrument of man's construction. The cornea, or external plate of the eye, which covers the "pupil" and "iris," answers to the concavo-convex lens. The eye has a most perfect set of muscles for moving it in various directions, like the "adjustments of a telescope."

The eyes of different individuals, vary in properties. The eyes of "long-sighted" persons are distinguished by the flatness of their cornea, while those "of short-sighted" persons, are by the reverse. Hence the use of spectacles, containing concave and convex lenses. The terms "long and short sights," are proverbial, as applied to Mental Vision, and "spectacles" to assist this sort of sight are also in use. They may be either adapted to the sight of the individual, or "borrowed;" in which case they may be unsuited "to the focus of his eye."

"Mental sight," varies even more than visual sight,—from partial blindness to perfect sight, nearly equally good and clear, for long and short distances. That is to say, its possessors have the power of altering the "focus of their eyes," in an eminent degree. This power physically, is equally perceptible "mentally." If the visual sight needs to be *adapted*, and the focus adjusted, to the amount of light, and the distance between the object and the eye focused; surely in Morals a similar process must occur. The size of different objects diminishes in proportion to the squares of the distance from which they are viewed. A similar diminution as the "squares of the distance," usually occurs in the "Mental view" of objects. The eye cannot at once, gaze on the details in a broad angle of view; a general idea, is all that we can hope to take in at a glance. "A detailed" or microscopic view is only possible, when very narrow angles come within the range of vision.

Two schools of painting represent these ideas; the first aims "at general effect in a picture," to the realization of a single view of objects, which in the broad angle usually chosen as a subject for the painter's art, discovers the principal objects "in detail;" and the subordinate in more "dim outline or shadow." The second, aims to depict natural objects "in all their minute details," such as are viewed by many careful microscopic examinations. The highest effort of art, would be to combine

the peculiarities of these two schools; to give the prominence and due subordination to objects according to their relative importance in a picture; to attend to the realization of the artist's idea: yet to give every object, the highest possible finish which naturally belongs to its position, with regard to "light and shade." Things great and small, should receive an equal degree of attention when treated morally; but an attention of a character in harmony with the relative size of the objects. Every vessel to be full, the small as well as the great.

Man and the higher animals possess two eyes; each of which —in man at least, affords a different angle of view, separately as "right and left hand perspective." But their union, yields an image in relief. This is the natural "stereoscopic image," the product of binocular vision: a subject little understood *for ages* even amongst the learned, but now in this present age is clearly seen, through the great light thrown upon it by the discovery of the stereoscope. In perfect binocular vision, a *single* image only appears. Our two eyes give us views of both sides of the object, as in Morals we are able to view "*both sides of a question.*" "A single eye" is mentioned in Scripture, and evidently refers to a straight view of things with undeviating steadiness or wavering to the right hand or the left; yet "looking at both sides of the question." This is single-minded vision in contrast with double-minded vision, which in optics is illustrated by "squinting," or comparatively independent vision with each eye. The "single" eye of Scripture is Binocular Vision. One eye gives but *lateral* perspective.

The binocular principle is of general application to optical instruments, in use by both eyes, as more "relief" to objects viewed through them is given by its use. The use of one of the eyes in telescopic or microscopic observation, when pursued to the exclusion of the other, like the excessive use of particular sets of muscles tends to distortion, and consequent injury to the whole human system. This optical view, has its analogue in a one-sided mental view, injurious to the sight if pursued by a person with two eyes; who by the simultaneous use of both, is a fair-judging person.

The magnification of objects, may be roughly divided into Two sections; namely at *long* and at *short* focus. The magnification "at long focus," is chiefly that used in the telescope, that "at short focus" in the microscope. The great distance of objects, renders the first necessary; while the second is rendered essential, by their proximity to the optical instrument. These two instruments, illustrate the different means available for the examination of truth. To Dr. Chalmers they afforded an illustration of the magnitude and the Universality of the

Power of God, equally applicable to the vastest bodies, and to the most minute.

The microscope reveals to us much that is otherwise invisible, it gives us an insight into minute details, in various divisions of Nature. The minute structure of bodies becomes known with the aid of the microscope, and by it we become conscious of the presence of forms, of the existence of which we had previously no conception. Almost every substance, has some characteristic form, even in the most minute state of division ; particularly in the Organic section. This affords a means for the analysis or detection of substances, to the examiners of compounds, natural or artificial, genuine or fraudulent.

There are two schools of philosophers, and two schools of physiologists, as there are two schools of painters. The first or microscopic school, dwells principally on what is near, what is minute, and perhaps invisible to ordinary observers. While the second mainly observes what is at a distance, considering the minute beneath notice, but dwelling rapturously; on the far distant, whose very *Distance*, gives it increased importance in its eyes ; and whose special interest, appears to be a want of connexion, with objects that can be analyzed and handled. This is the telescopic school. But the alternate study of these two methods of observation should be set before the mind ; that the materiality of the ONE may counterbalance the incomprehensible reality of the other. When the eye views through a powerful microscope a minute animal, plant or inorganic object, a cheese-mite becomes as large as a horse, or a grain of sand as a small mountain,—larger than the largest heavenly body appears to the unaided eye.

The camera-obscura, by an ingenious combination of a mirror and a lens, connected with a box darkened inside, yields on "the field," images of surrounding objects. By its aid photographs are taken, or a panoramic view may, be obtained of a landscape, with the aid of a suitably constructed camera, mounted on a situation to command the prospect. All optical instruments are blackened inside. The shade must be perpetually contrasted with the light, if things are to be clear and visible on Earth.

The prism which decomposes light, into its so called constitutional elements—the three primitive colours, is a three-sided figure a—Tri-unity ; which colours, typify the Three classes of faculties possessed by Man, as well as his threefold constitution. The blue may represent his Moral constitution, the yellow his Intellectual, and the red his Propensities. The combinations of these colours, form excellent popular illustrations of qualities in Man. It will be interesting, to trace the significance of some

of the combinations, of the three primitive colours. Yellow and blue form green, and typify the action of the Moral and Intellectual faculties,—refreshing and everlasting. Red and yellow, constitute orange, the type of the Propensities, acting through the Intellect. Blue and red, constitute purple which, typifies the Moral faculties, strengthened by the Propensities. Colours have been long held, to illustrate different Moral virtues: russet for instance, typifies humility. The most dull colours, are frequently compounded of the brightest, which may well point to humble merit.

The Spectroscope is an instrument with lenses and prisms, for the more perfect observation of the elements of light, than the ordinary prism affords. It is to that simple instrument, what the single lens is to the compound. With its aid much has been done towards the analysis of light. Flames of different colours are here reduced to their elements. From the coincidence of the colours of flames, arising from compound salts, and those of celestial bodies, similar composition has been inferred. This "spectrum analysis" affords a means of discovering the presence of the non-metallic elements in particular, in infinitesimally minute portions, hitherto beyond the reach of chemical analysis. The prism as we have before said, is a type of the Trinity, and its use illustrates the influence of this doctrine, in unravelling the mysteries of faith. Truths always, existing like the Rainbow from Genesis to Revelation. (Gen. ix. 13. Rev. iv. 3.) But not so fully unravelled in unscientific ages, until the "microscope" and "telescope" were added to the "prism." NOW WE VIEW THE STARS, WITH AN INTELLIGENCE FORMERLY UNKNOWN.

GOD is a *Unity* as well as a *Trinity;* and there are "Seven Spirits of God." (Rev. v. 6.) Light illustrates this, a Unity—Threefold—and Sevenfold. The harmony of colours is as great a reality, as the harmony in sounds. Certain colours contrast well, and relieve one another; as green and red; blue and yellow. This is analogous to the action of one quality on another Mentally; all tending to the maintenance of a harmonious balance.

The polarization of light, leads to results, the most wonderful in optics. Light reflected on a suitable surface, and made to pass at a proper angle on another surface, acquires new powers, although not visible to the naked eye. Applied to the microscope, polarized light brings into view in transparent objects, details of which ordinary observation, gives us not the slightest conception. To forms hitherto invisible, the most exquisite colours are given. This is due to the decomposition of light through its peculiar treatment.

By means of a magic lantern, a magnified and illuminated image can be thrown on a screen,—the principle is similar to that of an ordinary microscope. Painted slides, by mechanical contrivances, are made to assume the appearance of animated figures. Optical illusions, as they are made to appear and vanish, are supposed to account for the whispered mysteries of the invisible world, which men, alike in a civilized and savage state, dread. These optical "deluders," are types of spiritual "deluders," who would bring light out of darkness, and trifle with things of whose existence we are cognizant, but which are usually invisible. Such phenomena arise from that "light and shade" which at present surround us. THERE IS REASON TO BELIEVE THAT SHADE WILL DISAPPEAR,—THAT IT WILL DISSOLVE INTO ETERNAL LIGHT.

CHAPTER XVII.

AGES OF MEN AND ROCKS CONTRASTED.

SIX DAYS OF CREATION—IGNEOUS-ROCKS—GRANITIC-ROCKS—SERPENTINE—PEBBLE-HISTORY—ASBESTOS—MICA—CLAY-STONES—PORPHYRY—BASALTS—VOLCANIC-ROCKS—THE DELUGE—RE-CREATION—NOAH'S ARK—ORIGIN OF SPECIES—METAMORPHIC-SYSTEM—THE SCROLL OF ROCKS—THE CAMBRIAN—SILURIAN—OLD-RED-SANDSTONE—CARBONIFEROUS—PERMIAN—JURASSIC—LIASSIC—OOLITE—OXFORD-CLAY—CORAL-RAG—KIMMERIDGE-CLAY—PORTLAND-STONE—PURBECK STRATA, AND THEIR TYPICAL SIGNIFICANCE.

GEOLOGY is the science which traces the history of the Earth, from the earliest period of its creation. It includes the past, present and future history of our globe; but writers have mostly dwelt upon it as elucidating the past. Few branches of science surpass geology in interest, or convey more important lessons. WHAT CAN BE, MAY BE; WHAT HAS BEEN, WILL BE; WHAT IS, HAS BEEN BEFORE; either in fact or in type. Therefore we think the so-called Geologic Ages before the Creation of Man, and the Seven Days of Creation mentioned in Gen. i. which succeeded them, to be Types of one another, and of the different Ages in the so-called "Historic period;" which we believe to have *commenced* with the life of Man on Earth.

"In the Beginning, God created the Heavens and the Earth." (Gen. i. 1.) We have no knowledge, and can form little conception of the date of this Creation, for a vast period must have indeed elapsed since this stupendous event.

"The Earth was without form and void, and darkness was on the face of the Deep." This was the Age of the Inorganic world; the Age of the earliest rocks. A dark world; a type of Adam created, fallen and dark.

"The Spirit of the Lord moved upon the face of the waters. God said, 'Let there be Light,' and there was Light." This was analogous to the hope given to Adam, after the dark state in which he was found.

The Second Day saw the division of "the waters above the firmament, from the waters that were under the firmament;" analogous to the separation of Heaven from Earth; the dis-

tance of Man from God having increased; he had not access to the presence of God in the same manner as before his fall. He was not as it were surrounded by a spiritual fluid, which conveyed impressions directly from Heaven to Earth. Heaven and Earth were before in close proximity, which was analogous to the state of the material world, when sea and cloud were *all one.* In attempting to conceive of such a state of things, the mind itself "is at sea," but through the mist, beholds as the mariner does, the sea and the horizon as one.

Adam was turned out of his garden upon a comparatively dry, unproductive land. This was analogous to the dry-land which appeared on the Third Day. This Day saw the "Earth bring forth grass, and herb yielding seed," analogous to the multiplication of species among the race of Adam. On the Fourth Day, lights appeared. They were probably created on the typical day, and eclipsed on the literal days preceding; for they must have shone on the Earth before.

The Sun is the type of the Son of God, as the Moon the great satellite of the Earth is of the Church; while the twelve signs of the Zodiac, are types of the Twelve Apostles, and of the Twelve Tribes of Israel. These are the "eleven stars" of Joseph's dream (Gen. xxxvii. 9); he being the twelfth.

The Fifth Day saw the creation of whales, fish, and the animal life which swam in the sea, as well as the creation of fowls. This was analogous to the Antediluvian period, which ended in a flood of water. The Sixth and last Day, witnessed the creation of Man; and as we believe that of those Plants and Animals, which are of the greatest consequence to him. God told him to be fruitful and multiply; just as He told Noah. The Age of Noah, the first in which Man began to people the whole Earth, was an antitype of the creation of Adam; man having got as it were a new start.

The Seventh Day saw the commencent of God's Rest; and was a type of "the Sabbath of the World," of which the seventh day of the week was also a type, and was illustrated in the institution of the Mosaic-sabbath.

Inside this great system of analogies and types, there lies a smaller and narrower system of Circles, which illustrate progressive creation, in an analogous but somewhat different manner.

The First of the Six Days of Creation, is by this view believed to be a type of the Creation of Man on Earth; as the Second is of the Age of the flood, and the Third of the Age of the building of Babel. While the Fourth is of the Period of the Patriarchs, and the Fifth of the Age between Moses and Nebuchadnezzar. The Sixth carries us from classic ages to modern times: the period when man has attained his highest state of

development. Formerly he was hardly *a Man*, merely *a child*, compared to what he is now.

The different objects in creation have been imitated by Man. The earliest remains of zoophytes, resemble in some cases the very patterns of his calico prints, either by accident or design. And his different handiworks, avowedly adaptations of natural objects, are *types* of them. NATURAL OBJECTS OFTEN ILLUSTRATE THROUGHOUT THE PROGRESSIVE AGES OF THEIR CREATION, the *steps* Man has made in manufactures.

We shall endeavour to trace the analogy between the "Days of Creation," and the different periods in the history of Man; as well as contrast Natural objects with Artificial; and prove that *Art is but a Type*, as it is an Imitation of Nature.

"All Nature is but Art unknown to thee."

In previous portions of this work, the author has endeavoured to trace analogies with Man in the lowest forms of animal and plant life; and upward to the highest in their respective kingdoms; and between modern chemistry and Mental philosophy; between Physical and Moral optics; and to trace in the geographical features and fauna of every country, what is in harmony with the qualities possessed by its Human inhabitants. In this division he will endeavour to show in confirmation of the fact of Man being "The type of Creation" and of This Earth especially, that the Geologic history of the Earth with its accompanying Minerals and Organic remains, typifies and illustrates the various periods of Man's residence on Earth, and the state of His arts. We shall consequently proceed to review the various strata, and contrast ages in "the Human Period," with "Ages" in rocks.

The Igneous-rocks, thrown up from "the bowels of the Earth" by volcanic agency, at an earlier or later date, contain no Organic remains, except those that may have got accidentally into them. They are commonly called "Unstratified," as they occur irregularly as regards superposition. They force their way through other strata to the surface, when acted on by subterranean forces.

Igneous rocks are frequently divided into three classes; the Granitic, the Trappean, and the Volcanic. The Granitic consists principally of rocks allied to granite, which is a conglomerate of mica, felspar and quartz; they together form a hard, compact mass of great density. Granite is one of the most enduring of rocks. The various materials of which it is composed, have no appearance of abrasion, such as would occur in minerals brought together in a watery medium. They were probably forced together by enormous pressure, at great depth in the

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earth. The granitic are the most deeply rooted of known rocks, forming the foundation of all other strata of which we are cognizant. Granite rocks are not necessarily "Primitive," although they are mostly found in Primitive Formations.

We see in the Igneous rocks, types of Man newly created, and just "planted" on Earth. His future movements were based on the status he then acquired, and were analogous to the superincumbent strata on the granite : it formed the foundation ; as it were "the table" on which movement and action took place.

Granitic rocks, long withstand time and weather. A coast bounded by them is only polished by the storm ; and a nation's history read in pyramids of granite, like those of Gizeh, or the monoliths of an Egyptian or Cyclopean age; last from their earliest erection, to the end of a historic period ; and excite our wondering interest with regard to the architects of such great structures. They were erected in "primitive times" and suitably of primitive rocks.

The first of the Granitic Rocks is the *granite* itself, and the various minerals that occur with it. Some are of dazzling brilliancy ; while others contribute much to our comfort or convenience.

The minerals which accompany granite, are quartz, hornblende, mica, hypersthene, felspar, schorl, garnet, tourmaline, talc, steatite, chlorite, topaz, serpentine and many others.

Serpentine is a most important rock, the markings of some varieties of which are like a serpent's skin, while the veins of others resemble the undulations of a serpent's course. At the period when man first appeared on earth, "the Serpent" was very busy, and a *serpentine*-form has been worshipped in all the ages that have followed. Serpentine itself has long been a favourite material for articles of daily necessity or luxury. It is cut into slabs for inkstands, or as a mantelpiece presides at the domestic hearth ; its fine veins and markings, being so much the subject of admiration.

Felspar is another important mineral of varying transparency, and being rich in potassa, when disintegrated, adds greatly to the fertility of the soil. Plants whose ashes contain potassa, owe much of this alkali, to the decomposition of this mineral.

The disintegration of granite is highly significant as a type, and presents analogy with the generations of men. We have first the granite, which we may call the grandmother, by the destruction of whose matrix, the felspar is separated. Secondly we have felspar, which we may call the mother of kaolin. The third generation, is illustrated in the numerous applications of kaolin. These analogies are not altogether new, for the terms "matrix" among mineralogists, and "mother-liquor" amongst

chemists, as parents of metals or crystals, are of constant occurrence, and are an irresistible argument, for the never-to-be-forgotten tie, that links the sons of men to "Mother-Earth." The decay of minerals to form a soil for the growth of plants, represents the decay and death of Man, to leave room and provide resources, for the growth of The Man of the Higher race.

Quartz, one of the hardest and most important of minerals, is one of the most common constituents of rocks, and consequently its base Silicon must be a most abundant element in Nature. It is most frequently crystalline in form. Quartz or silica is the name generally applied to flint, agate, or other stones which are found in very varied strata.

The importance of quartz can hardly be over-estimated. It is one of the most solid of minerals, and in a clear form like that of rock-crystal, may be made one of the most dazzling in brilliancy, and cut into spectacles may assist our eyes to stem the current of years.

We hold pebbles to our eyes, and see in them the history of the different ages of the world typically represented. If the pebbles have their edges rounded, we exclaim that they have passed through a period of Conflict and violent contact with each other—like that process which polishes nations. If simply fragmentary yet crystalline, we see relics of a former state of advancement which has passed away. The broken angles which reflect light, illustrate that internal evidence which illumines the recesses of history :—THE HISTORY OF STONES IS READ IN THE STATE IN WHICH THEY ARE AT PRESENT.

Hornblende or amphibole is a most important rock, being found all over the world, and occurs in a considerable variety of forms and colours. Asbestos is a variety of amphibole ; it can resist extraordinary temperatures without change or fusion, and is suitably found in Igneous-rocks. It is a type of immortality which is unaffected by fire. The corpse of a noble Roman was wrapped in a cloth made of Asbestos. According to Pliny, the body was consumed, but the ashes were kept together, so as not to be mingled with the ashes of the fuel—the type of that individuality which attaches to every human being. If the elements which he has used during his life, are needed on his demise for the support of new forms, still an immortal seed of life remains,—" the shadow " of a living being—" the ashes of a corpse."

Mica is a mineral varying in appearance, being brown, green, or colourless. That from Siberia is of a brilliant, silvery white, and readily splits into plates, thinner than paper, in a remarkably even manner. It is often almost as transparent

as glass. It resists intense heat, and has little brittleness compared with glass or other minerals; very few of which can bear the least bending without breaking. Mica when added to other materials in stones, gives them the property of cleavage, and of shining in some instances like gold, for which it has frequently been mistaken. The micaceous rocks of the valley of the Oronoko, to the vivid imagination of Sir Walter Raleigh, appeared Mountains of Gold. The existence of the rocks containing this yellow mica, led to the belief in an "*El Dorado*" of the West.

The beryl, the tourmaline, the topaz, and the garnet, occur in this granitic strata, as do gold, silver, iron, copper, lead and most other metals. Sufficiently significant of a *primitive* period, when the elements and their simple combinations ruled,—types of Adam in the garden of Eden, when fewer "elements" were at work than afterwards appeared on the scene.

Trappean-rocks come next to the granites; the term "trap" being derived from *trappa*, which in Swedish means *a stair*. These rocks are thought to have been formed with the aid of water, and of the ashes or dust of volcanoes, forced into compact form by pressure, or deposited from turbid liquid, and lastly interspersed with veins of lava-like appearance, for they show evidence of fusion.

The Trappean and allied rocks, are usually associated with Secondary-strata; as the formerly spoken of Granitic are with the Primary. The minerals contained in them, are greatly those accompanying granite, but are of later formation, they are also rich in metallic ores. Porphyries accompany this class of rocks. As a class they may illustrate the World before the Flood; much irregularity and chaos, but still *steps* are seen, which lead to higher strata.

The Clay-stones, one of their most important constituents have a very earthy aspect, but when interspersed with crystals of felspar, form porphyry, a conglomerate—a type of Diluvian Society, which was composed of *two* Discordant Elements.

A finely-polished specimen of porphyry, has almost the lustre of a mirror, and is frequently of a bright flesh-colour. It is not a very distinct mirror, and the imagination must be exercised to enable the beholder to see brilliant images therein. Etty, in his painting of the world before the flood, "conjured up" real flesh and blood,—that Flesh and Blood which had disappeared beneath the Deluge, and laid them before our eyes.

Porphyry is a most durable material, it disputes with the syenite of Syene in Upper Egypt, the privilege of forming a part of the immortal relics of the past glories of "The Land of

Ham." This compound porphyry, by its very durability and extensive distribution in all countries, may represent the permanent and well-nigh universally spread notion of a Deluge. Porphyry is a remarkably hard and tough mineral, difficult to reduce to powder or break, and yet capable of being fashioned into ornaments.

Most of the cornelians, agates, chalcedonies and jaspers, are found among the Trap-rocks. They seal our letters, they burnish our gold or our silver, and are even "broached" on the bosoms of our fairest women. These stones represent Enochs, whose names are signets of truth, imperishable "breast-plates of righteousness" in an unenlightened age, worthy of being set in gold or silver to go down unchanged to posterity. Bad weather but little dims their lustre, as do evil companions those whose characters are of a pure and exalted kind. They may be smeared with filth, but soon wash clean.

Basalts are hard and dense among the Trap-rocks, they are of a very dark and dingy hue. They often assume most peculiar forms, appearing like columns, reared by man; such as those at the Giant's Causeway, or the "Ribs of Samson," near Edinburgh, and the far-famed Cave of Fingal. These masses of basalt, resemble the mightiest monuments of the hand of Man, and by their grandeur and rugged aspect, which resist many a storm, appear the strongholds or bulwarks of Giants, and are often said to have been the work of "Titans." The unscientific attribute them to the "Giants before the flood," and surely they present analogy to any works set up by man of a Gigantic character, and intended to defy the waves or the blast.

The Volcanic-rocks are eminently *Igneous*, but the expression is generally confined to rocks formed by volcanic or subterranean agency, since the close of the great Tertiary-period.

Volcanic agency is one of the most striking phenomena that the Earth affords, and exceeds in violence and terrific force, wind, rain or waves. Hundreds of miles of country have been shaken by earthquakes, evidently traceable to this volcanic agency; and thousands of square miles of land and sea, have been sprinkled with ashes, upheaved by the explosion of gases from that gigantic mortar, the crater of a volcano. Perhaps as high as Chimborazo where the sky touches the crater's mouth, or as low,—as in the case of submarine volcanoes, where the sea-water is only swallowed, to be vomited in disgust; with the contents of the crater's stomach, stones, pebbles, or the skulls of drowned mariners, to be scattered over the waves, until an Islet is upheaved for their graves.

The hidden fires within the Earth, reduce to a state of fusion

those "alkaline earths" and their salts, which ordinarily require the most intense heat known to the chemist. As they are partly cooled by earth, air or water, they effect their greater or less decomposition, and cause a violent ejectment, either in the form of vapour, cinders or heated liquid. This process is doubtless what we call volcanic agency. These forces were anciently ascribed to "Pluto," and the term "Volcanic" is well known to be derived from Vulcanus, the god of fire. This agency like that of the tempest or the storm, *is but a type*—as it is admitted to be the expression of Divine Power.

The Deluge that occurred in the days of Noah, was as much *volcanic* as pluvious. "The fountains of the great Deep," were opened on the earth, which was the scene of a convulsion, the opposite of that recorded in Gen. i. 7, where "the waters under the firmament, were divided from the waters which were above the firmament." Noah's Deluge, was therefore but a return for a short period, to a former state of things. "The fountains of the great Deep" or hidden waters within the earth, were let loose, occasioned probably by the explosion of gases within "the Crust of the Earth," which was thereby broken. This force caused a temporary alteration, in the relation of the specific gravity of one portion of the Earth to another, as the clouds do to the sea.

There is no mention of rain before the flood. Hence it has often been inferred that there was none, only dew. This, if true would be an important type, dew being the emblem of earthly blessings, rising out of the substance of the Earth in the form of the mist, as was described to be the case in the garden of Eden. The rain which fell was a type of Spiritual agency; first in judgment as God's wrath, shown in destruction of life, and after the flood in blessing, as assisting the renewal of life which is compared to baptism (1 Pet. iii. 21)—a type of death and renewed life:—of an Earth which had passed through Death, but which was *restored* to life after the subsidence of the waters.

We hold creation to be *Progressive*, and all argument based on the examination of strata, tends to show that it is progressive towards Higher life. The animals and the plants "before the flood," were probably fewer in number of species than those after it, and their organization was probably less advanced.

We think it pretty clear, that after the Universal Deluge there was a *Re-Creation* of Animals and Plants, higher in organization than those which preceded it. Noah's deluge was the last of its kind, and the type of a future deluge by fire, which is to precede a New Creation as Noah's probably did. NOAH AND THE ANIMALS WITH HIM IN THE ARK, WERE

RELICS OF A FORMER STATE OF THINGS, CARRIED AS MEMENTOS INTO A NEW AND LATER STATE. Man at least will bear an analogy to this in a future Age; he will be an *Imperishable* Relic from a Mortal World, which has passed away.

The destruction of the Antediluvian world, was probably by volcanic agency, which we consider the type of "the Flood" in Noah's days. The Volcanic-rocks are formed out of the materials of *earlier* strata which volcanic forces anciently broke up as did the flood the more Modern, and formed the connecting link between Older and Newer strata.—Those men who lived after the deluge were still descendants of Adam.

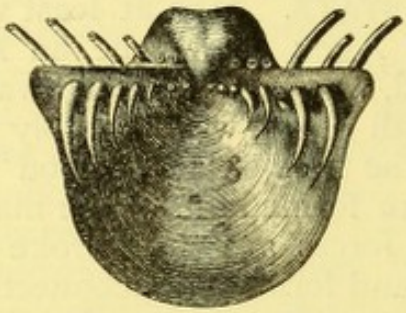
This view of a New Creation of animals and plants after the flood, consisting mainly of the species now existing, which are eminently adapted to diverse "centres of Creation," would remove many difficulties which have long perplexed students. They have justly enquired how an ark, 300 cubits long, 50 cubits broad, and 30 cubits high;—or 525 feet long, 87 feet wide, and 52 feet 6 inches deep,* could accommodate the animals now known on the globe.

It is said with great truth, that the utmost that such an ark could have held, would have been 100 species of quadrupeds, 200 or 300 species of birds, and 5,000 or 6,000 species of insects and small creatures; with the vast variety of food, living and dead, necessary for their sustenance. When we consider what menageries are, we feel convinced that Noah and his family must have been well employed, in looking after so great a variety of creatures, which could not have been collected from beyond their own district, instead of as some have rashly supposed, from all parts and to include all now known on the globe.

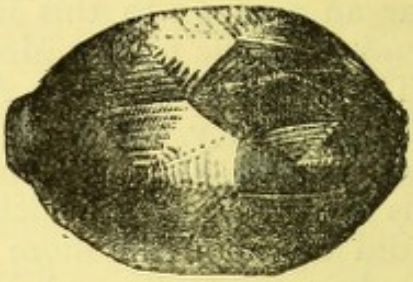
There are now known of species on the globe, from 6,000 to 8,000 Birds, 1,600 Mammals, more than 600 Reptiles, and some hundred-thousand Insects, besides innumerable plants, which could not stand *many months' submergence.* Also numerous fishes, marine and fresh-water, which could not exist together, and would therefore require RE-CREATION as well as the Plants, Land, Sea, and River-shells.

We hold the hypothesis of "a *Universal Deluge*," but not of a universal preservation of species in the Ark, only the preservation of those in the immediate neighbourhood of Noah to be types with him of a former state of things; relics of the World which had passed away. This is analogous to a change in Man, called "Regeneration." The New Creation after "the Flood" was analogous to the New creation in Man, and to the

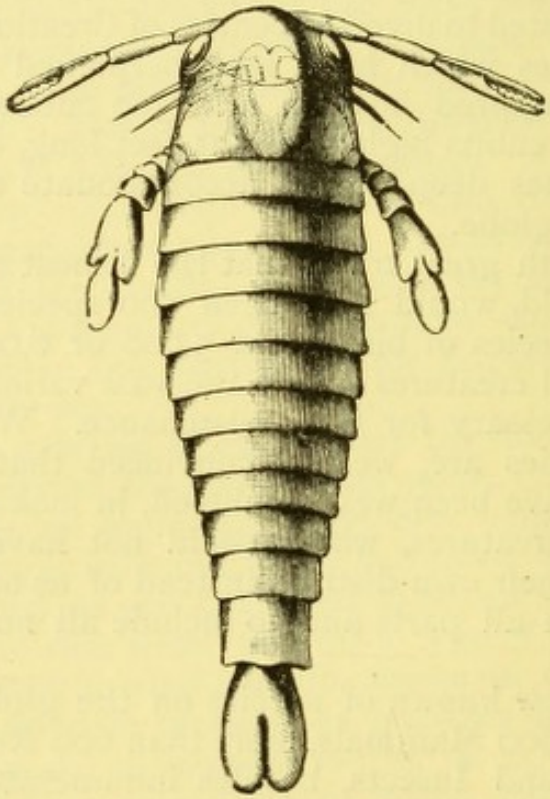
* We have followed the cubit of a man (21 inches) as it is most likely the earliest cubit in use, as it was a measure derived from the human body.



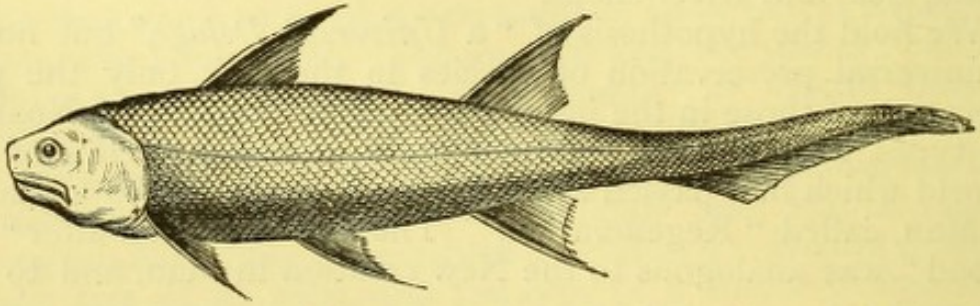
PRODUCTUS HORRIDUS. P. 431.



HEMICOSMITES PYRIFORMIS. P. 430.
SILURIAN ROCKS.



PTERYGOTUS BILOBATUS. SILURIAN ROCKS OF SCOTLAND. P. 430.



DIPLICANTHUS. DEVONIAN PERIOD. P. 430.

future new creation in Heaven and Earth. Even after the regeneration of Man, he still retains relics of his former state, just as Noah was accompanied in his ark by the animals belonging to a Pre-diluvian epoch.

The variation of so-called "species," would be explained, if we supposed a creation of thousands or hundreds of thousands of each species, with variations suited to the climate in which they were created, to be still further accommodated to circumstances as time rolled on. This is absolutely opposite to the Darwinian hypothesis, which supposes the existence *originally*, of a very small number of Species, *varieties* of which are the now so-called "Species."

The narrative of Noah and the deluge that occurred in his days, is a plain and simple one of natural phenomena, appointed for the destruction of the men and the fauna of the globe. We exclude miracles altogether, as not mentioned in the sacred narrative. The hypothesis of the preservation in the Ark, of all the animals now known on the globe, supposes that two of every unclean, and seven of every clean beast and bird were brought into one spot from the Arctic, the Antarctic, the Temperate and the Torrid zones: from the smallest insect to the largest quadruped; from the smallest humming-bird to the largest condor. It supposes the transport of all these creatures great and small; over rivers that they could not swim in, and over seas that they could not fly across or swim in.

This theory would also involve their being brought back to their respective localities, in the same way, at the close of "the Deluge." For as was previously remarked, there is a general adaptation to every country of its Fauna and Flora; its resources are in accordance with their wants. The climate of the residence of Noah as a general *rendezvous* for the beasts, would not be suited for those of all lands.

We think that the deluge of Noah was *not partial*, in opposito the views commonly held by scientific men. For against the view of a partial deluge it is justly argued. That it is said in Gen. viii. 4, "Every living substance that I have made will I destroy from off the face of the earth." And that "the high hills that were under the *whole heaven* were covered," and that "*all flesh died* that moved upon the Earth; both of fowl and of cattle, and of beast, and of every creeping thing that creepeth upon the earth, and every man, all in whose nostrils was the breath of life, and all that was on the dry land *died*, and every living substance was destroyed that was upon the face of the ground, both man and cattle, and the creeping things, and the fowl of the heaven, and they were destroyed from the earth, and Noah only remained alive, and they that were with him."

It is frequently said that the terms "Whole Earth" and "Heaven," are often used to include merely the earth known to the ancients, and passages like the following are quoted. "The Lord God of Heaven hath given me all the kingdoms of the earth." (Ezr. i. 2.) "And there were dwelling at Jerusalem Jews, devout men out of every nation under Heaven." (Acts ii. 5.) These passages clearly refer solely to Human beings, ndmost others that are usually quoted to the same effect, apply only to the nations inhabiting countries known at the time. The terms used in Gen. viii. are much more exact and conclusive, than those in which Cyrus stated, that he was master of all the Kingdoms of the World.

The geological evidence for a partial deluge, has never been conclusively established, in connexion with any special *locality*. The animals of various classes and species, must have been let loose upon a land fitted to receive them. Green with herbage for the Herbivora, and abounding in animal life for the Carnivora. In fact a Fauna and Flora, RE-CREATED and arranged for them. They could not have immediately begun to devour each other, if only two or at the most seven existed of each species; which were still further decreased by those offered by Noah in sacrifice. Unless we accept this hypothesis, we must believe that the character and habits of the Carnivora were entirely altered, and those also of the Herbivora. Instead of feeding on vegetables they must have fed on *stones*.

Re-creation is a necessary hypothesis, unless we suppose that the Earth was a sterile waste when Noah went out of the Ark: FOR VEGETATION CANNOT SURVIVE SUBMERSION FOR MANY MONTHS IN SALT-WATER. If we accept the view held by Hugh Miller and other Geologists, of a partial deluge and preservation in the Ark of the animals of a particular district, still *Re-creation* is involved, as necessary for a provision of sustenance, for a carnivorous and herbivorous population.

Had the deluge been partial, Noah might have migrated with his family to another "quarter of the globe;" but it appears pretty clear that such an alternative was not available as it was with Lot in Sodom. The deluge was a judgment upon the *entire* Earth, in which God re-assumed the reins of government, Moral and Physical, and by one *great act*, divided chronology into two all-important epochs.

The principle of progressive creations, of the advance in each towards higher life, involves destruction and decay, as all physical growth does. This great principle, renders further *creation* after the flood, necessary as a part of that harmonious link, which connects the Age after "the Flood," with previous Ages.

The Race of Adam, although not positively newly created, yet received in the apparent *individuality* given to Shem, Ham and Japhet, what was analogous to a New Creation. It was so to speak a creation of THREE distinct varieties of Mind in Man, to be set simultaneously in the bodies of the Three great Fathers of the Human Race. MAN AFTER THE FLOOD, RECEIVED A FRESH START, AS WELL AS ALL ORGANISMS LOWER THAN HIM, OF WHICH HE IS THE TYPE.

The Metamorphic or Hypozoic-system containing strata of gneiss, quartz-rock, mica-schist and clay-slate, represents the period of Man's history immediately after "the Deluge," that is to say before the subsidence of the waters. It was a period when animal and vegetable life was greatly paralyzed, as at the time of the great flood of Noah's days.

The Gneiss, Quartz-rock and Mica-schist groups, are destitute of the remains of animal life, and are thus called "Azoic," that is *without life;* while the term "Hypozoic" means* *under life;* but still they are *preparatory* for life. The three kinds of strata, the Gneiss, the Quartz-rock and the Mica-schist, are as a whole less hard and dense strata, than the lower-granitic, and the crystals of the minerals which they contain, are smaller and less distinct. These strata show an evidence of the action of water or flood, which has worn and broken the crystals of felspar, quartz and mica they contain, this is apparent in Gneiss, and still more so in Mica-schist.

These different mnerials, torn, divided and split in the flood or process of metamorphosis, may remind us perhaps of those individuals who were "cut off in the flood," and who lost their footing in the Antediluvian strata.

The Clay-slate is even more plainly of watery-formation, than the Gneiss and Mica-schist. It is an important group, for tablets of the slate, roof our houses. Slates however vary very much, some are quite unfit for roofing, being soft and inclined to crumble to powder, others so hard and brittle, as to be obstinate under the slater's axe.

We have now come to a very important period in Geologic history; to the strata where *life* begins. It is usually considered that the Paleontological period, commences with the Cambrian-strata, from no remains of animals and plants being found at an earlier date. The vast periods of time which have elapsed

* Against this we have to consider the recent discovery of the *Eozoon Canadense*, in the Lower Laurentian rocks of Canada, which according to Dr. Carpenter and others is the remains of an organism to be classed with the Foraminifera; but the subject is as yet *sub-judice*. Should these remains be conclusively established as of Organic origin, still these strata in which they are found may not be so old as is commonly supposed.

from the first creation of Organic life, to the creation of Man, are types of one another.

Thus the oldest known seaweeds and Zoophytes, are types of the earliest state of man after "the flood," just as the creation of the highest animals beneath man, are of man's fullest development.

We shall draw analogies between successive strata in human society, and those in rocks.

The rocks are the recording scroll, the records which unfold the history of the Earth, the perpetual witnesses to what is past. They differ in texture, like the divers materials which record the chronology of ages. The earliest writing on papyrus and on the leaves of the palm, are the oldest writings extant, and are *analogous* to the Plant records in the rocks. After a while skins of beasts were used, typifying ages of Animal life. Is the "world in its dotage" that it is turned to grass like Nebuchadnezzar,—to record its deeds on perishable paper? Becoming more perishable in every generation. First we have Flax Paper, not calculated to last Ages. Next we have Cotton Paper, more perishable still. Lastly we have straw Paper, which will soon crumble to dust, together with its record:—it is thus with rocks.

As we judge of Ages in "the Historic period," by the men and their surroundings moral and material; that is to say their morals and mode of life; so do we in our review of geologic ages, base our estimate of them, on the animals and plants, characteristic of the period. Such are eminently analogies of Man, as their works and belongings, are of His arts and manufactures.

The degree of preservation in which fossils are found, varies much. Some retain a sharpness and distinctness, which notwithstanding their vast antiquity, make us fancy that they were but of yesterday. Others of later date, from being "water-worn," or "weather-worn," are less clear, and fail to produce that distinct impression on our minds, which fossils of an earlier date often do. The same remark applies to the records of distinct periods of history, which are often "not well preserved and clear," in proportion as they are recent: although as a whole, in history as in geology, the more recent records, are the most distinct. There are periods of "Drift" or Chaos in both; in which the records are irregular and of uncertain date; although a great mass of the material for the history of the time may appear.

The chroniclers of the different Ages of the "historic period," being the work of men who have once lived, vary in distinctness with the graphic power of the narrator, who is as it were the

mirror in which the events shine. The medium of the Geologic record, may be opaque or clear. It may be a hard and durable *Portland Oolite*, with ill-preserved fossils, analogous to the indistinct historian. Or clear like amber, embalming its heroes in all the solidity and beauty of life, or recent death; and imparting to each a distinctness, which inspires almost with the breath of life, the relics, even of an age which has EXPIRED.

The Cambrian-strata, formerly called the Transition or Greywacke, which so much abounds in North Wales, and Cumberland, exhibit but few remains of fossils. Only a few indistinct casts of seaweeds or Fucites, a small zoophyte (*Oldhamia antiqua*) allied to the *Sertularia*, a few worm-tracks, and the simple crustacean *Palæophyge*.

This Age may be a type of the earliest condition of Man "after the flood," of whose mode of life we have so few distinct records, but still sufficient to give us, as in the case of those early rocks, some idea of the beings that lived in those days, and their simple habits and pursuits. These were the beings that lived for the first few hundred years after the flood, before Babel was talked about.

These three distinct classes of organisms, the Zoophytes, the worms whose track we find (*Arenicolites*) and the Trilobites, represent by their different habits, the three Fathers of the Nations of this Age. We have Ham sensual and lowest in the scale, a mere "Zoophyte" amongst men. We have Japhet of the "Earth—earthy," inclined to burrow, and form his house in the earth or of the earth*—like worms. While Shem higher in organization, was immensely in advance of the other two brethren, if not in ingenious works, at least in Morals. This superior race is typified in the family of Crustaceans.

Should at any future date, the progress of geologic discovery throw back to a more remote period than that acknowledged at present, the date of the commencement of Organic life, such would be analogous to the change, which would come over the public mind, when it was discovered that the ancestors of the present races, carried their civilization to a higher pitch, than the moderns at present are willing to allow. Such would involve, but an earlier date for the commencement of analogies, between Man and Organic remains.

The Siluria of the ancient Britons, Shropshire, Radnor and Montgomery, distinguished for the great abundance of the now so-called "Silurian" groups of strata, tell of ages teeming with life, and busy activity, perhaps confined to the orders of *Fucites*, *Lycopodites*, *Lepidodendron*, Corals, Encrinites, Mollusca, Crus-

* The writer attributes the round mud-huts found in Northern Europe and Asia, to Japhetic populations, variously termed "Finnic," "Cyclopean," or Pre-historic.

tacea and Zoophytes. These show analogy to the condition of Man, in the days of the tower of Babel, the first great period of activity after the flood, when men began to execute great things, and were scattered over the globe, like this Fauna of Zoophytes, Crustacea and marine plants.

The Upper and Lower-Silurian rocks of Llandeilo, Wenlock and Ludlow, and their equivalents abroad, contain many organic remains. The fossils of this period are marine, but represent the bottom of the deep ocean, as well as of the shallow sea. No indication of a dry-land fauna occurs in these strata, and animals with a back-bone are entirely wanting, so far as research has gone. But it is "the Paradise of low forms of Life," there they lived, roamed, and died; and there their relics remained, patent proof of a lively and energetic population, whose representatives in the present age, still point back to them as types of classes, which flourished ages before; and which still attest the immortality of great classes.

These Silurian ages are types of the periods of the earliest Patriarchs, when those "Back-bones" of nations, powerful Despotic Monarchies were wanting.

The Old-Red-sandstone or Devonian system of rocks, is extremely extensive. These terms, although not exactly synonymous, yet refer to similar strata. The name "Old-Red-sandstone," is sometimes more subordinately applied, to that portion of the strata found in Scotland, of which Hugh Miller was so able a biographer. These strata in Scotland at least have been divided into groups, which generally exhibit characteristic fossils; unless as in the accompanying strata of conglomerates, they have been apparently washed away. Sandstones of a yellow or white colour, are accompanied by the remains of fish of *Diplicanthus*, *Holoptychius*, *Glyptolepis*, *Pterichthys* and others; but few remains of vegetables have come down to us from this remote period, they being of a more perishable character. Probably only the harder or more enduring stones, long retain their impressions. This is less the case with the more advanced divisions of this family of rocks.

In the Old-Red-sandstone we have the *Pterygotus anglicus* a gigantic crustacean, which probably measured five or six feet long. Far larger than any of its class now known to exist:—the *Inachus* of Japan, approaches it in size.

We have now reached the age of back-boned animals, which we think has its analogue in the age of the kings of Egypt and Assyria, contemporary with the later patriarchs.

The various genera of fish, illustrate different nations, who at this early period, adopted a despotic form of government. The *Cephalaspis* or buckler-headed fishes, remind us of Egyptian

warriors, whose shields were held up before the head as a guard. The *Pterichthys* and others of the box-fish class, are representatives of ages when armour was much used in war.

If the Vertebrata represent the great Kingdoms of Nineveh, Egypt and Elam, the Crustaceans do the great Sheiks, such as Job and Abraham. These crustaceans exceeded many fishes in size and strength; as much as the greater Sheiks like Abraham did the petty kings of Gerah, Sodom or Gomorrah.

The ferns whose graceful tracery, begins to show the evidence of a dry-land fauna, are types of civilization and culture, which in their allies the *Lepidodendrons*, became a type of the extravagant growth of special arts, which have never flourished to the same extent since. Such as some of those of the days of the earliest Pharaohs.

The Carboniferous system, is especially rich in that element carbon, the main constituent of the vegetable kingdom. Coal and mountain-limestone are its most characteristic rocks. The Millstone-grit is a third important rock of this formation. The Lower-Coal-measures or Carboniferous-slates, are next to the Old-red-sandstone in order of strata. They greatly abound in fossils such as *Lepidodendrons*, *Calamites* and *Stigmaria* among the plants. The Lepidodendrons were gigantic club-mosses allied to conifers. The innumerable tree-ferns are abundant relics of a luxuriance, carried to a greater pitch than that in lower strata.

As we rise to higher-strata, and as we approach our own times, we see organisms *rise higher*, attain higher organization; and Civilization amongst Men, rise in its Standard. Excellence in *certain arts* may be diminished; but as a whole, civilization must rise; and in each Age must a Higher Race come into view. These Lower-coal-measures, were not the Age of great reptiles or fish, although a few fishes are especially abundant.

The Age of Mountain-limestone, abounds in corals, *Euomphalus*, *Spirifer*, *Terebratula*, Encrinites and Madrepores.

In the coal generally, remains of reptiles are found; and slabs of sandstone from the coal strata of Pennsylvania, attest the presence at one time of a reptile with a frog-like foot; probably somewhat like a crocodile in shape. The climate of the coal-period, is thought to have been warm, damp and misty, from the arborescent character of the ferns, which appear to do best at present in this sort of atmosphere. The vegetation was mainly terrestrial, but still the presence of shells allied to *Spirorbis* (*Microconchus*), would imply at least brackish water; as in the strata about Shrewsbury. The presence of the shells of *Cypris* a fres-hwater Entomostracan in the same locality, favours this.

Casts of fossil-trees in the form of tubes of coal, are found in these strata. The trunk is as it were formed of sandstone, and the bark of coal; by the falling in of which in the attempt to remove the coal, the excavating miner is often crushed. The fossil-trunk falls and kills the labourer; as a detached tree, would in its native forest. Many trees of the pine or Coniferæ class, attain a great height, as also the *Calamites* and *Lepidodendrons;* here is their metropolis. All this is characteristic of the Upper-coal-measures.

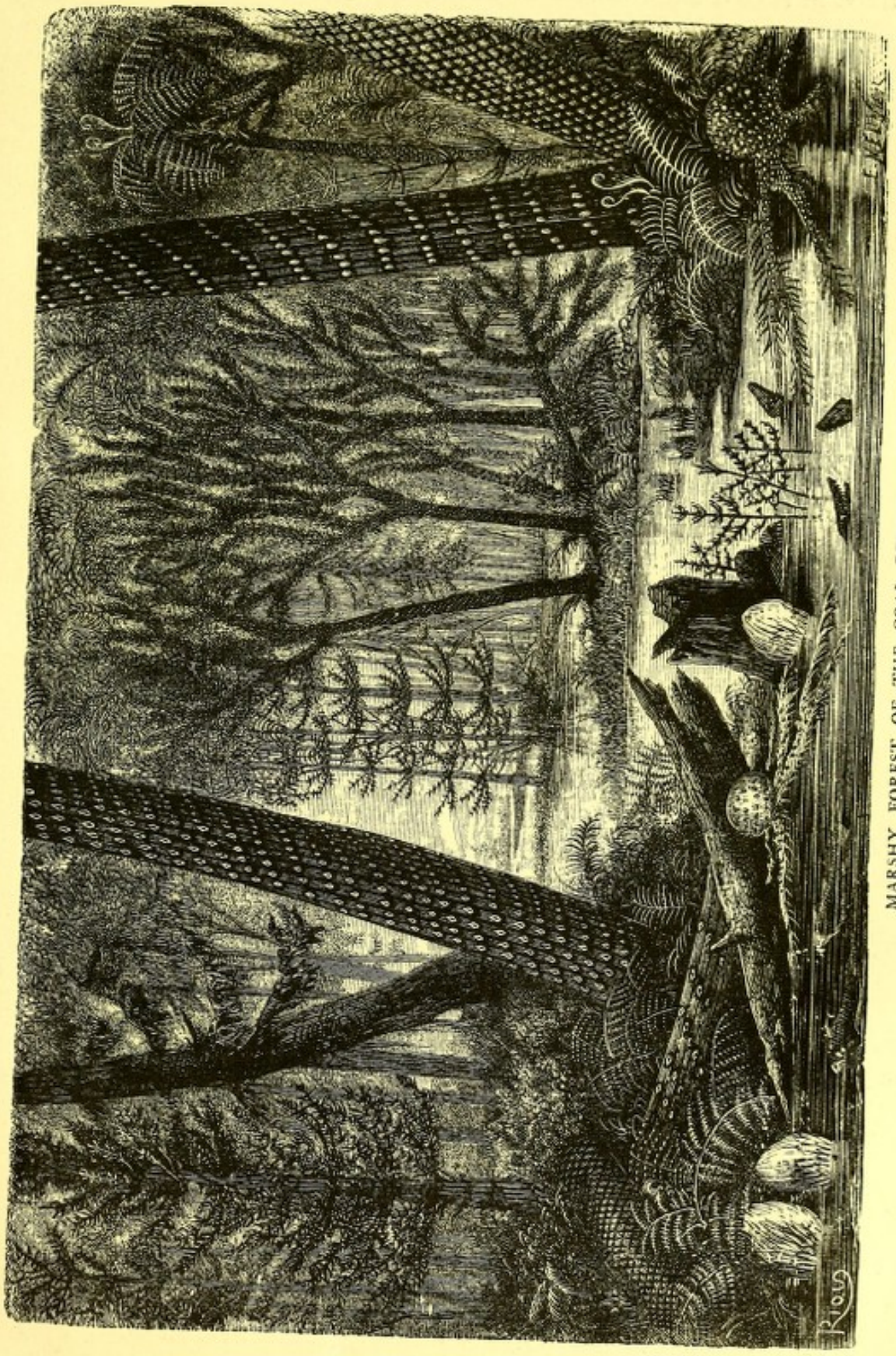
This Carboniferous-system, is a type of the Age between that which saw the commencement of great monarchies, and the beginning of the Israelitish-Kingdom. This probably includes the time of Cheops, who is said to have built the first pyramid. Art and Science had not as yet "flowered" in the same brilliant way they afterwards did. A little flower, analogous to that which the Conifers must have had, is a type of rising civilization. This coal or black period is a type of Hamite civilization or that amongst black races.

The Permian or Magnesian-limestone group corresponding with the Lower-New red-sandstone, are strata which succeed the coal-measures. The Crystalline or concretionary-limestone, is placed by Sir Charles Lyell *first.* (Elements, 1865, p. 457.) These strata contain numerous little shells, but are extremely varied in their character. Typifying historically, a period of change and disturbance, but not of violent revolution.

The Permian strata are further divided by Professor King in his account of the Permian fossils, into Brecciated-limestone, Fossiliferous-limestone, Compact-limestone, Marl-slate, and Inferior-sandstone of various colours. The Fossiliferous-limestone, contains corals, and the Compact-limestone, fishes of many species. True mammals have not yet been found in these strata: they commence in the Triassic—the first Age of Quadruped-mammals, a class of creatures which approach Man in many important physiological characteristics;—such as in the secretion of milk, warmth of blood; and in bearing living young.

The Permian strata, we consider by its intermediate character, typical of that period between the decay of Hamite-civilization, and the rise of the Babylonish-monarchy.

The Jurassic-group, contains many smaller groups, the lowest of which is the Lias, succeeded by Inferior-Oolite, Great or Bath Oolite, Oxford-clay, Coral-rag, Kimmeridge-clay, Portland-Oolite and the Purbeck-beds; all of which are more or less rich in fossils. The Lias is especially distinguished for the excellent preservation of the Organic-remains accompanying it. It is sometimes called "Gryphite-limestone," from the abund-



MARSHY FOREST OF THE COAL PERIOD.

ance in it of a shell allied to the oyster, which was termed by Sowerby, *Gryphæa incurva.*

The Lias is a stone little adapted for building, as it cracks, and falls to fragments on exposure to weather. The Crinoids of the Lias are numerous, and *Ammonites* also abound, as do numerous fish, or rather their fragments, such as *Acrodus, Hybodus, Chimæra* and the *Lepidotus.* One of the most remarkable bivalves is the *Avicula cygnipes,* of Phil., which somewhat resembles the webbed foot of the *Anatidæ* or duck genus; but the grandest remains found amongst the Lias, are those of numerous species of *Ichthyosaurus,* and a smaller number of *Plesiosaurus,* gigantic lizards or Saurians, which must have given a distinctive character to the whole period.

In the strata of the Lias above described, we see the predominance of great reptile forms. Amongst the Vertebrata they are the rulers of the Age. They typify the monarchs among men. We consider the period of Lias, typical of that of the Persian monarchy, and the great Saurians typical of the Persian Monarchs. The *Ichthyosaurus* might represent the Median; while the *Plesiosaurus* represents the Persian monarchs.

We have authority from Scripture and tradition, to contrast Nations with Animals; which have in all ages symbolized them by their characters and habits, and have appeared on standards as the representatives of nations.

The fishes allied to the sharks *Hybodus* and *Chimæra* may illustrate the Persian Satraps who preyed upon the husbandmen, as the great fishes did upon the smaller fry of their day. The Mollusca and lower forms, so abundant, may represent slaves; while the Crinoids by their elegance and complicated structure, illustrate arts, which were carried to a high state of perfection in those days.

The Inferior-Oolite, is especially rich in molluscan shells, numerous *Ammonites, Terebratula, Pleurotomaria, Rhynchonella, Ostrea,* and among the Echinoderms, *Collyrites.* The Fuller's-Earth with its accompanying shells, is found near Bath, as a sort of connecting link, between the Inferior-Oolite and the more characteristic Bath or Great Oolite.

The Great-Oolite contains the remains of plants, especially the Coniferæ; such as the *Araucaria* and *Podocarya.* In the Stonesfield-Oolite, remains of Marsupials are found, analogous to those so characteristic of Australia, which likewise furnishes in the present day the Araucarian pines, the contemporaries of these Mammals in our ancient strata.

A division of the "Great-Oolite," occurs at Bradford near Bath. The fossils are enveloped in clay, especially the En-

crinites, which has contributed greatly to the high state of preservation in which they are found.

The Oxford-Clay belongs to the Oolitic-group, it is especially rich in *Belemnites* and *Ammonites.*

The Coral-Rag is an important division of the Middle-Oolite, distinguished as its name implies, for the abundance of remains of the coral-class, which are accompanied by Molluscan-shells, allied to oysters, and a genus of whorled-shells termed *Nerinæa.*

The Upper-beds of the Oolite are somewhat numerous. The rocks which furnish the stones so much in request for lithographic drawing, are those of Solenhofen in Bavaria. They yield fossils in an extremely beautiful state of preservation. Impressions of dragon-flies and other insects, lizards, fish and Crustacea, are here seen to the number of several hundred species, including many *Pterodactyles,* all of which were determined by Count Münster, as mentioned in Lyell's "Elements of Geology" (VIth Ed. p. 393). "The famous feathered enigma," considered by Professor Owen to be a true bird, and named by him *Archæopteryx macrura,* was found in the same strata. The portions of the skeleton found, approach the Saurians in many of their characters. Hence the scientific world were for some time in doubt, whether to call the newly-found fossil, the remains of a bird or of a reptile.

The Kimmeridge-clay contains much impure coal, or shale of a bituminous character. Many marine-shells are found in it. The small number of remains of plants which occur in it, have led some to believe that the large portion of carbon in these strata is from an animal source.

The Portland-stone so justly celebrated as a building-material, is one of the UPPER divisions of the Oolite. Numerous trees are found in it; but it is less famous for the fine preservation of its fossils than older strata.

The Purbeck-beds yield to the explorer many organic remains. They are divided into Upper, Middle and Lower-beds.

The Lower-Purbeck strata, contain many relics of fresh-water *Entomostraca;* especially of the genus *Cypris.* This is fresh-water marl, which is broken up in some places, as for example in Portland and the Isle of Purbeck. Above the fresh-water strata, lies a so-called "dirt-bed," which is a stratum of supposed vegetable mould, containing stumps of trees. These are various, some being clearly coniferous, while others such as the *Cycadeoidea megalophylla,* are allied to the *Zamia spiralis,* at present living in Australia.

The Middle-Purbeck strata, contain the remains of fish turtles and cyprides, which are believed to have inhabited fresh

water,—below which are brackish-water-beds, containing the well-known bivalve *Cyrena*. Fragments of the skeletons of many Mammalia, are found to accompany the Middle-Purbeck-beds, the anatomy of which have great affinity with the Marsupials of Australia.

The Upper-Purbeck or higher division, is rich in fresh-water shells, similar to those that at present occupy our lakes and rivers. Such as *Limnæa*, *Planorbis*, *Physa* and *Valvata*. And among the bivalves, *Cyclas* and *Unio*, with the Entomostracan *Cyprides;* and a few fish considered to belong to fresh-water genera. The Purbeck-marble, so much used for pillars in mediæval architecture, is discoverable by a metallic-*ring*, even when not easily recognizable by the eye. This is the case in St. Mary-Redcliff church, Bristol, where 400 years of smoke and dirt, have obscured the colour and markings of the pillars.

We considered that the Lias or earliest section of the Jurassic-group, is typical of the Persian monarchy. We shall endeavour to show how far the Oolitic groups, are typical of the great divisions of the Greek empire, and of the character of that nation, stern hard and extremely enduring, but capable of receiving "a high polish."

Like the fuller's-earth which adjoins this Inferior-Oolite (as at Bath), the Macedonian element, acted "as a detergent" among the more licentious and impure elements, yielded by other divisions of the Greek nationality. The Inferior-Oolite stone, is hard dense and compact, "like a Macedonian phalanx." The Great-Oolite is altogether a softer stone. It may illustrate the Greek Empire at the period of its greatest elevation, when it yielded numerous graces, the result of intercourse with the East; at the expense however of solidity, as contrasted with that of the Macedonians.

The Lithographic-stone, by the high state of preservation of its fossils descending to us from such a remote period, is typical of the clear-light in which we see historically the history of the Greek Empire. Greek modes of expression are even now imitated, and used to convey modern thoughts; just as the lithographic-stone, assists in reproducing the ideas of the modern graphic-artist. What is small and relatively insignificant in Greek history, may be compared with the impressions of insects preserved in the lithographic-stone; while the larger and more important fossils may typify sages and heroes. The fresh-water strata such as the Purbeck-beds, with exceptions, may represent the inland Greeks.

The genius of Phidias, exemplified in the frieze of the Parthenon, carved its individuality indelibly on this polished age. The "tables of stone" which adorned that building were the

perpetual records of a covenant of taste, made with the Athenians.

The Portland-Oolite by its hardness, and the relatively bad preservation of its fossils, may typify the Spartan division of the Greeks—their ruggedness and enduring qualities, and the ill-preserved relics we have of their antiquities. The Mammals, so characteristic of the Middle-Purbeck strata, may illustrate the "Dawn of Science," or perhaps the analytical mode of cultivating it, practised by the Greek Sages.

CHAPTER XVIII.

AGES OF MEN AND ROCKS CONTRASTED.—*Continued.*

CRETACEOUS-ROCKS—WEALD—LOWER-GREEN-SAND—LOWER-CHALK—HASTINGS-SANDS — GAULT — BLACKDOWN-BEDS — CHALK-MARL — UPPER-CHALK — EOCENE — WOOLWICH AND READING-SERIES — LONDON-CLAY — MIDDLE-EOCENE — BRACKLESHAM-STRATA — ST. HELEN'S-SERIES—HEADON-SERIES—BEMBRIDGE-SERIES—MIOCENE OF ENGLAND—OF FRANCE—OF BELGIUM—OF GERMANY—OF CROATIA—OF SWITZERLAND—AND OF INDIA—PLIOCENE OF ENGLAND—BLACK-CRAG OF ANTWERP—RED-CRAG—NEWER-PLIOCENE—NORWICH-CRAG—PLIOCENE OF ITALY—POST-TERTIARY—GLACIAL OR DRIFT-PERIOD—RECENT-STRATA—STONE, BRONZE AND IRON AGES—CONCLUDING EPILOGUE.

THE Cretaceous rocks of Europe are divided into Upper and Lower, which we shall consider separately. The Lower-Cretaceous division or Neocomian, consists of the Hastings Sands, Weald Clay, Atherfield-beds, Kentish-Rag, Ferruginous-Green-Sand, and their continental equivalents. While the Upper, contains the Gault, Upper-Green-Sand, Chald-Marl, and White-Chalk; and similar formations are found in other lands.

The Weald is an important formation, and lies at the foot of the Lower-Green-Sand of England. It is divided by Sir C. Lyell and others, into the Weald-Clay and the Hastings-Sand. The Hastings-Sand being the lowest, we shall treat it first. Many fresh-water shells such as *Paludina, Cyclas, Cyrena, Melania* and *Melanopsis* are found; also others that live in brackish and sea water; as *Corbula, Mytilus* and *Ostrea.*

Remains of plants such as *Sphenopteris gracilis,* are found in the formation, equivalent to the Hastings-Sand near Tunbridge Wells. The Weald-Clay contains the famous *Iguanodon,* the teeth of which possess saw-like edges. It was a creature of vast bulk, but is believed to have been a feeder on vegetables. The Sussex-marble found in these strata, is full of the shells of *Paludina.*

Much has been said of "The denudation of the Weald," and of the period and length of its occurrence. It is one of the most

important of geological processes. *They* typify the breaking up of Empires and nations, and the formation of new ones.

The Lower-Green-Sand, is a portion of strata, formerly believed to be older than the Gault. Some modern geologists call this Lower-Green-Sand, *Neocomian.* That portion of it which is exposed at Atherfield, abounds in large bivalve shells, such as *Perna Mulleti.*

The Lower-chalk contains numerous curious remains, such as the bivalve shell *Diceras Lonsdalii, Ancyloceras gigas,* and *Trigonia caudata.*

The Lower-Cretaceous and Weald-formations, we believe to be typical of the Roman Empire. The great shells of the Green-Sand, may illustrate the *As* or Bronze coinage of early Rome, as the *Diceras Lonsdalii* that horn-shaped bivalve, may the "little-horn," which typifies the power of Rome. The *Terebratula* in these strata, is shaped like the lamp of the Vestal-Virgin.

The *Iguanodon* and other great reptiles of the Weald, may be compared with the twelve Cæsars, many of whom were surely "cruel monsters."

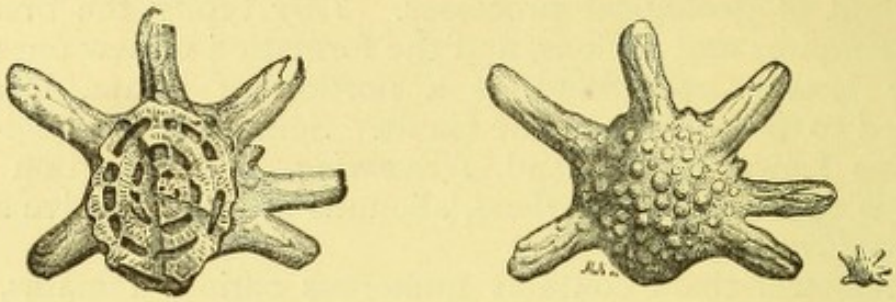
The Hastings-sands with its numerous fresh-water fossils, may illustrate the more effeminate condition of Rome and its less vigorous rulers, in the days when the Goths were first attacked; while "the denudation of the Weald," typifies the inroads and ravages made by them on the Roman Empire.

The Upper-Cretaceous-system is immensely rich in organic remains, embracing those of a great variety of orders.

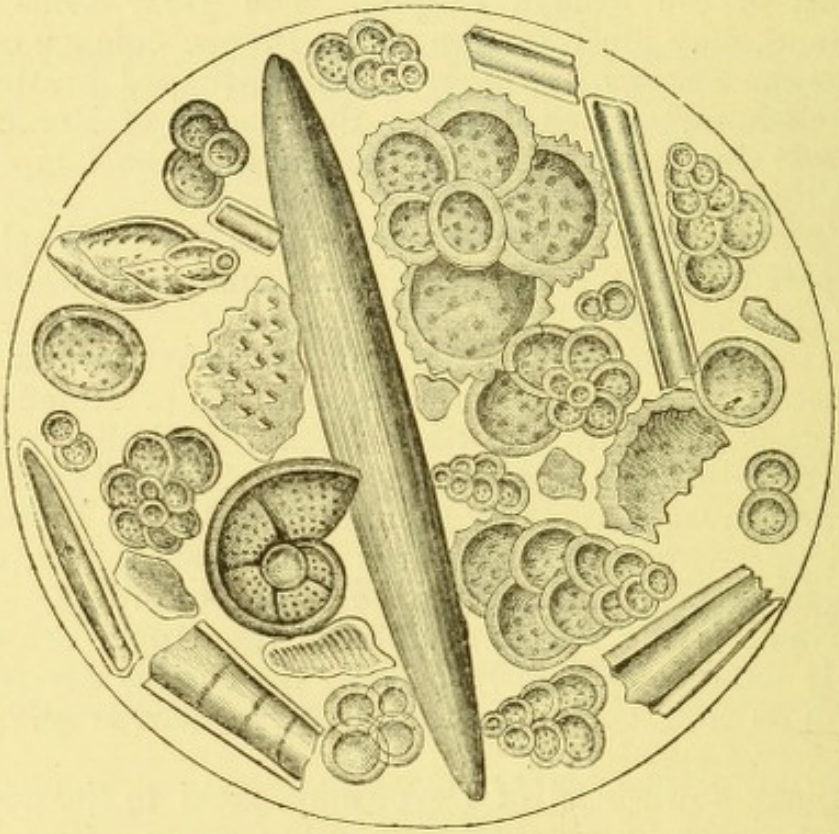
The Gault is the lowest division of the Upper-Cretaceous-group. It abounds in shells, especially the curious *Terebrirostra lura,* with its long beak, and the large *Ancyloceras spinigerum,* a chambered Cephalopod.

The Black-down-beds of Devonshire, yield to the geologist, fossils not generally obtainable in other strata. The Upper-Green-Sand, is the successor of the chalk-marl in the south of England.

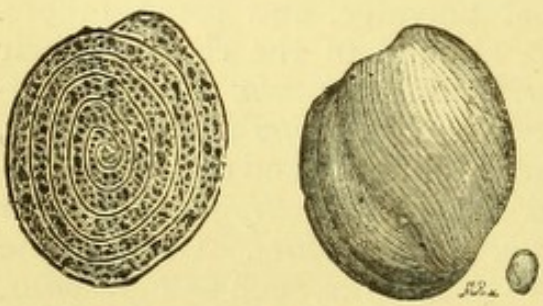
The Gray-Chalk or Chalk-Marl, contains large shells, such as *Turrilites costatus,* that great univalve, and some others. Mollusca, sponges and *Bryozoa,* abound in the chalk. Their forms are very numerous. *Terebratula, Crania, Pecten, Plagiostoma, Lima, Ostrea, Rhynchonella, Belemnites* and *Baculites,* are represented there among other Mollusca: and of Echinodermata, *Ananchytes, Micraster* and *Galerites,* of *Bryozoa, Eschara* and *Escharina,* and the sponge, *Ventriculites.* Of fish, the most important are those allied to the sharks, such as *Ptychodus,* clearly connected with the living genus *Cestracion* of Australia. A little fossil-wood occurs in the chalk, supposed to have been



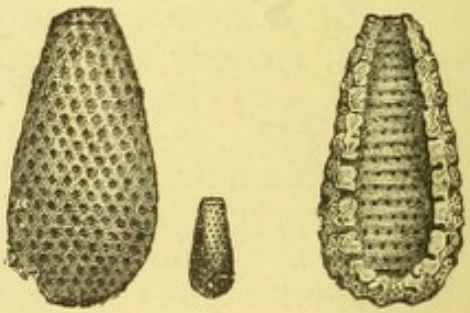
SIDEROLITES CALCITRAPOIDES, FROM THE UPPER CHALK, NAT. SIZE AND MAGNIFIED.



FORAMINIFERA FROM THE CHALK OF GRAVESEND, HIGHLY MAGNIFIED.



FABULARIA DISCOLITHES, EOCENE OF VALMONDOIS.



DACTYLOPORA CYLINDRACEA, EOCENE OF VALMANDOIS, NAT. SIZE AND MAGNIFIED.

drift-wood, as this formation is believed to be marine. Bones of reptiles, as the turtle and *Pterodactyle*, are found in the Maidstone White-Chalk.

The Upper-Chalk is typical we consider, of the Eastern half of the Roman Empire, or that of the Greeks. Like the Newer-Chalk, it goes down to a much later period of time, than the Western Empire and its type the Lower-Chalk and Weald-Clay.

The fossils of the Upper-Chalk are much better preserved than those of the Lower-Green-Sand and Weald-Clays. They are the vivid records of the rocks, and have their analogues in the well-preserved Byzantine manuscripts, whose paintings are even illustrated in the prismatic hues, which sometimes adhere to the shell of some long-perished mollusc of the chalk. The *Turrilites* resembles in form the mitre of the Greek Patriarch, as the *Galerites* does a Byzantine-helmet; and the *Belemnites* and *Baculites*, arrow heads and lances. The sharks an exclusively marine genus of fishes, in these strata, illustrate the naval forces possessed by the Byzantine emperors, which greatly preyed on the resources of other states, as these great fish did, upon the Echinoderms and Molluscs, of their day. The *Mosasaurus Camperi*, a great marine lizard, whose skull measures three feet long, may represent the Emperors of the East, the successors of Constantine.

The great Eocene formation is divided into three, the Upper, Middle, and Lower-Eocene. These differ considerably like other formations, according to locality. Sir C. Lyell in his Elements, p. 295, has given a table of the French Eocene-strata, with their English equivalents; an arrangement which we shall adhere to in this important formation.

The lowest English strata of the Lower-Eocene division, are the Thanet-Sands. These contain species of *Cyprina*, *Scalaria* and *Corbula*. The French equivalent of the Thanet-sand, is the "*Sables de Bracheux*." The famous fossil skull termed *Arctocyon primævus*, Blainville, was found in this formation at La Fère in the Department of Aisne. This creature is allied to the bear in its structure.

The Woolwich and Reading-series, or "Plastic-Clay with lignite," is accompanied by *Cyrena cuneiformis*, and *Melania inquinata;* shells which indicate at least brackish water; while others such as *Unio* and *Paludina*, found in these strata, are shells indicating the presence of water, nearly or quite fresh. These strata in England says Lyell (El. p. 292), are believed to be of exclusively mechanical origin; while the French *Argile-plastique et lignite*, is a more regular succession of strata. In the *Argile-plastique* in the neighbourhood of Paris, *Melania inquinata* and *Cyrena cuneiformis* are found, and also *Ostrea*

bellovacina. At the base of the *Plastique-clay* at Meudon, in 1855, bones of a wader as large as the living ostrich were found, which has been called *Gastornis parisiensis.*

The London-clay is a formation *lower* than the lowest beds of the Middle-Eocene, being the *Uppermost* of the Lower-Eocene in England. The London-clay is very tough, and is either blue or brown in colour. The Septaria or Roman cement-stone, which is so much used for making the valuable water-proof cement, is found in the London-clay at Harwich. This London-clay greatly abounds in organic remains, such as fruits of different species of palms (*Nipadites*), the *Pandanus* or screw-pine, with fruits of the custard-apple, and of gourds, melons and acacia ; all of which point to a climate such as now exists within 20° of the equator. Sir C. Lyell, El. p. 290, mentions that Dr. Hooker, observed numbers of the nuts of *Nipar fruticans*, floating in the river Ganges. These being nearly allied to the palm above named, as being found in the London-Clay, are an additional argument in favour of the general warmth of the climate, in the days when these now extinct palms, flourished on the banks of the Thames.—Bones of crocodiles, turtles and sea-serpents, are the accompaniments of the fruits and seeds of the London-Clay.

The fishes of this London-clay of Sheppey, are numerous. Agassiz describes fifty species : among them a species allied to the sword-fish (*Terapterus priscus*) and one resembling the saw-fish (*Pristis bisulcatus*). The accompanying Mollusca of these strata, are most analogous to those at present found in the seas of the tropics, such as *Nautilus*, *Cyprea*, *Voluta* and *Conus.* The large *Rostellaria ampla*, is represented by the little *Rostellaria pespelicani* of the British seas. The *Leda amygdaloides* and *Cyptodon angulatum* are among the many bivalves found.

In these strata, but not certainly accompanying the marine fish and shells during life, we find the bones of land animals, both of birds and quadrupeds. The latter being represented by Pachyderms allied to the tapir and the pig. These floated down like the fruits of the palm, and were devoured doubtless by the great fish of their day, and their remains are cast up by the civilized man, to form an agreeable and satisfying "intellectual repast" for the modern geologist—an intellectual "shark."

The London-Clay has an equivalent in the Paris basin, as well as in the neighbourhood of Cassel-hill near Dunkirk. Somewhat lower strata, analogous in some respects to the London-clay, are found at Kyson in Suffolk, lying beneath the Red-Crag, and above layers of yellow and white sand. This Eocene-Clay contains remains of Mammals, particularly of

the genus *Didelphis* of the Marsupial class. Fragments of bats and serpents, of sharks and other fishes allied to them, are likewise found. Proving a great commixture of terrestrial and marine strata.

The Middle-Eocene is represented in England by the Bagshot and Bracklesham beds; and in France by the *Calcaire-Grossier*, and the *Soissonais-Sands*, or *Lits-Coquilliers*. The Bagshot-beds have been divided into three divisions. Firstly a layer of pale yellow sand; secondly a layer of dark green sand and brown clay; and thirdly a layer of the yellow sand under the clay. Generally no fossils are found in the Bagshot-beds; but in a few localities, marine shells of *Nummulites lævigata*, *Turritella sulcifera*, and *Venericardia planicosta*, have been obtained.

Bracklesham bay near Chichester in Sussex, gives its name to important strata, which contain many organic remains. A large sea-serpent (*Palæophis typhæus*), which Professor Owen thinks must have been more than twenty feet long, existed in the British Eocene-sea. It has some analogy to the great living serpents—python, boa and Hydrus. The bones of the tail, show analogy to those of the swimming-serpents, now living in the tropical seas. The gavial (*Gavialis Dixoni*, Owen) is found at Bracklesham, and various species of fish, such as *Mylobates Edwardsi* and spines of *Ostraceon*; both of which have their analogues in the fish now found in the Indian-ocean. Numerous teeth of sharks are likewise found, some of which are serrated, as those of *Carcharodon heterodon*, Agass. and *Galeocerdo latideus*, Agass. And among the teeth with plain edges, those of *Otodus obliquus*, Agass. and *Lamna elegans*, Agass.

The Molluscs are represented by *Pleurotoma attenuata*, Sow, *Conus deperditus*, *Turritella multisculata*, Lam., *Voluta Selseïensis*, Edwards, and *Lucina serrata*, Dixon.

The plants of the Middle-Eocene, are considered to have resembled those of India and Australia. They belong to the laurel, the fig, and the leguminous tribes.

The Upper-Eocene, is divided into three principal sections; of which the first is the White-Sands and Barton-Clay. They abound in marine shells, such as *Mitra*, *Voluta*, *Cardita*, *Terrebellum* and *Chama*. The French equivalent of these White-sands is the *Grès de Beauchamp* or *Sables-Moyens*, equally rich in shells of marine genera.

The Osborne or St. Helen-series, stand second in the Upper-Eocene, they abound in fresh or brackish-water shells, such as *Melanopsis*, *Melania*, *Paludina* and *Cypris*. The seeds of a species of that humble genus of plants, *Chara*, are also found. The Headon-series of strata, are found at Headon-hill, and White-cliff bay, Isle of Wight. They are of fresh-water and

marine formations. *Planorbis euomphalus*, Sow., *Neritina concava* and *Limnea cordata*, found at Headon-hill, are indications of the presence of fresh-water. While *Cerithium concavum*, is an indication of brackish-water, and *Cytherea incrassata*, is indicative of the presence of sea-water, during life. The *Helix labyrinthica*, Say., at present a land shell, living in N. America is likewise found at Headon-hill, which marks the connexion with terrestrial life.

Similar strata to the Headon, are those at Hordwell or Hordle-cliff, near Lymington, Hants. There fresh-water shells are likewise abundantly found; and mammals, reptiles and fish. Among them the remains of the *Paloplotherium*, and *Anoplotherium*, of quadrupeds, and *Emys* and *Trionyx* amongst tortoises; *Paleryx* amongst terrestrial serpents, and several species of *Lepidosteus*, analogous to the bony pike, now found in the rivers of America.

The *Calcaire-Silicieux*, or *Travertin-Inférieur*, is the French equivalent of the Osborne and Headon-series. It contains land and fresh-water shells, but rarely if ever any bones.

The Bembridge-series, is the uppermost of the Upper-Eocene, it consists of clays, marls, and limestones; of fresh-water, brackish and marine formation. Professor Forbes says that these strata, contain the following organic remains. The Upper-marls yield *Melania turritissima*. The Lower-marls yield *Cerithium mutabile* and *Cyrena pulchra*, in the Mollusca. And amongst the *Chelonians*, *Trionyx*. The Green-marls contain species of *Ostrea*, *Arca*, *Nucla*, *Mytiti*, &c.

The Bembridge-limestones, are of a pale buff colour, and are varied with layers of shales and marl. They afford land shells, as *Bulimus ellipticus*, and *Helix occlusa*. Also fresh-water shells, such as *Planorbis discus*, and *Limnæa longiscata*. And among plants, seed-vessels of *Chara tuberculata*. The strata in the neighbourhood of White-cliff bay, yield *Flabellaria Lamanonis*, Brong.—a species of fan palm, which is also found in the corresponding French strata.

The Binstead-Stone of Ryde, belongs to this Bembridge-Series, and has remains of mammals allied to the tapir and Rhinoceros, which are likewise found in the gypsum deposits at Paris. The *Palæotherium magnum*, *Anoplotherium commune*, *Dichobune cervinum*, and *Chæropotamus Cuvieri*, are examples of the genera found there. The French equivalent of this, is the celebrated Gypseous-Series of Montmartre.

The Eocene-period as a whole, illustrates the Gothic Period of History.

The Thanet-sands, lowest in the Lower-Eocene strata of England, with their little shells and their French equivalent the

Sables de Bracheux, in which the skull of the great bear was found; may typify the period of British helplessness in the fifth century; while the power of Attila the Hun, may be illustrated in that of this Great Bear—*Artocyon primævus.*

The period of the Woolwich or Reading-series, with plastic-clay and lignite, or mottled clays and sands, as an Age of Geologic-history, may typify the commencement of the Early Saxon period in England, and that of the Franks in France, to that of King Arthur in England, and to that of Clovis in France.

These strata formed in brackish-water, illustrate semi-marine habits in a nation. The clay represents the lower population, while the lignite, illustrates the terrestrial element or land forces; which in this age especially, were intermixed with the marine.

The British Plastic-clays with lignite, are almost entirely of mechanical origin, and are much more heterogeneous and irregular in character than the French; typical of the greater mixture of Gothic and Celtic nations in England, than has taken place in France.

The great wading bird *Gastornis parisiensis*, may illustrate Clovis himself, who first fixed his capital at Paris. Clovis was "a wader," but he waded through blood as well as water.*

The London-clay may illustrate a considerable period of British history, from the days of Arthur to the defeat of the Britons by Egfrid the Saxon. The fruits of the palms, pines, and other trees found in these strata, illustrate Celtic civilization:—these fruits resemble those of the East. Many Ethnologists ascribe to Celtic civilization an Oriental origin, mainly on the ground of resemblance.

The numerous bones of reptiles, turtles, sea-serpents and crocodiles, typify the mingled strength, weakness and depravity of this period; as well as the aquatic habits of many of the population.

The sword-fish and saw-fish, found in these strata, typify savage rulers of the sea. These fishes are not like those found at present in British waters, but resemble the fishes of the Indian ocean. Tyranny on the ocean is more practised by Eastern nations than by European, whose early history is better illustrated in the present state of the Oriental Archipelago.

* The reign of Clovis was perpetual war. At twenty years of age he conquered Gaul by the defeat of Syagrius the Roman governor, and soon after married Clotilda, daughter of Chilperic king of Burgundy whom he afterwards dethroned. Through the influence of his wife he became a Christian and instituted that religion in France. In 507 A.D. he led his army against the Visigoths, and was for some time at a loss how to convey his army across the Vienne, until a ford was pointed out by a hind, when he waded across at the head of his army. On his conquest of the Visigoths he commenced a persecution which well-nigh extirpated them.

The Pachyderms of the London-clay, typify the monks who have been so often in later ages compared with swine. These thick-skinned animals, floated from other regions at the formation of the strata where their remains are found. The monks came from beyond seas. Their learning was great, but it frequently resembled that of "learned pigs."

The Septaria or Roman cement-stone, which is ground in mills for making the valuable fixing-agent, typifies the union of the various tribes to form kingdoms or great states. A whole building represents a great state, and the distinct stones represent the tribes of which it is formed. This did not take place in these early days, but was reserved for a later age. The Septaria is not the mineral which gives compactness to the strata in which it is found; for its useful properties in this respect, only came into exercise at an after period.

The Middle-Eocene, may illustrate the first half of the Saxon dominion in England, till Egbert.

The Bagshot and Bracklesham-beds, represent these strata in England. The Bagshot-Sands containing few organic remains may represent the indistinct and little-known portions of Saxon-history; while the Bracklesham-beds with their numerous and well-preserved fossils, like the Saxon-chronicle, give a vivid idea of the period to which they refer. The Bagshot-beds, consist of layers of pale-yellow-sand and brown-clay, which typify the union of yellow and dark-haired races,—*the Celtic and Saxon elements* among the population.

The sea-serpents of Bracklesham bay, typify "the Sea-Kings," their great size and power being highly significant of that of Human rulers. The Gavial and great fishes, such as *Mylobates* and *Ostraceon*, with the various species of sharks, may be compared with the different kings of the Heptarchy, who were conquered by Egbert.

The White-Sands and Barton-Clay, contain many shells of exotic genera, such as are now found in tropical climates. They illustrate the taste, for foreign luxuries which now began to be acquired in England among the Saxon kings.

The Osborne and St. Helen-series, being of fresh or brackish-water origin, typifies a period in Saxon history when the marine-forces were less in use, and more attention was given to the cultivation of the ground, as in the days of Alfred the Great.

As a general rule, we are inclined to think, that the Mammals when found in strata, are a type of the Christian period, or in ages before Christianity, of those distinguished for religious enlightenment. The great thick-skinned animals of the Headon-series, may typify priests and religious instructors; the greatest among them being the *bishops;* while the robbers, pirates, and

those the prey of superstition, may be illustrated by the fish and reptiles of the strata.

The Bembridge-series, the Uppermost of the Upper-Eocene, contains many fresh-water and land shells, with a few indicating the presence of brackish-water. The large numbers of the hog-family in these strata, illustrate the growing influence of the priests, as the Saxon period advanced. Those akin to the Rhinoceros may typify Archbishops, while the Pope himself is illustrated in a *future* Geologic-Age, by the RHINOCEROS WITH THE LITTLE HORN. Similarly Gypsum-strata at Paris, answering to the Benstead-stone, illustrate priestly influence in that country.

The great Miocene-formation, is less represented in the British strata, than any of the great formations. Some geologists would exclude it altogether. Sir C. Lyell (El. p. 237) thinks that the Lower-division, is partly represented by the Hempstead-beds of marine and fresh-water formation, and by the Lignites and Clays of Bovey-Tracey.

The Hempstead-series, contains many shells of fresh and brackish-water genera, such as *Cerithium*, *Limnæa*, *Planorbis* and *Unio*. The Pachyderm *Hyopotamus*, allied to the boar and Hippopotamus, is likewise found. The Lignites of Bovey-Tracey, contain many remains of plants, especially ferns, such as *Lastræa stiriaca*, and many conifers, as *Sequoia;* seeds of the grape, of several species of *Nyssa*, *Annona*, and *Nymphæa;* with leaves of laurels, figs, oaks and palms. The Leaf-beds of the Isle of Mull are believed to belong to the Lower-Miocene strata.

The Miocene formation in England, typifies the later Saxon period. The Leaf-beds of Mull, illustrate the days of the early Scottish chiefs, and of Ossian; one of the "green spots" in the barren field of early Scottish literature.

We shall now consider the Miocene-strata of different countries, which typify, we think their mediæval history. We shall commence with that of France.

The Miocene-strata of Bordeaux and the south of France, may be said in general terms, to illustrate the mediæval history of Aquitaine and Provence.

The Lower-Miocene, may represent its earliest history; while the Upper does that in the days of Elinor of Guienne;—that is to say the 12th Century.

The Upper-Miocene strata of Gers, is remarkable for the remains of the *Mastodon angustidens* and *Dinotherium giganteum*. Fossil apes have been found in similar deposits, as *Pliopithecus* and *Dryopithecus*. This last is believed to have been as tall as a man, to have lived on fruits, and to have climbed trees in search of them.

These great apes may typify the Capets; while the Mastodons and Dinotheriums who had as much or even more power than the apes, illustrate the *Maires* of the palace.

The Lower-Miocene strata of France, are very conspicuous in the Auvergne. This region has been a scene of great physical convulsions. Lakes covering a large extent of surface have sunk from view: mountains have arisen by volcanic agency; which has again assisted in the formation of new lakes. Successive formations of Eocene, Miocene, and Pliocene strata, are here found to illustrate the history of this region, one of the most picturesque in France.

The fresh-water strata found in the Auvergne, are arranged by Sir C. Lyell in four divisions (El. p. 221.) First the Sandstone, Grit, and Conglomerate, including Marl and Red Sandstone. Secondly Green and White foliated-Marls. Thirdly Limestone or Travertin, often Oolitic in structure. Fourthly Gypseous-Marls, which overlie green-Marl,—rich in the shells of *Cypris*.

ALVEOLINA OBLONGA, EOCENE OF PARIS, NAT. SIZE AND MAGNIFIED.

The Upper-Miocene-Faluns of Touraine (Lyell, El., p. 210) yield many fossils, as at Louans, where portions of bones of the *Mastodon*, *Hippopotamus*, *Dinotherium*, *Chæropotamus*, Deer, Dolphin, Walrus and other Cetacea are found, but all are of species not now existent. The Mollusca of these seas, belong to genera more frequently tropical or semi-tropical, as *Fasciolaria*, *Conus*, *Mitra*, *Terebra*, *Pyrula*, *Oliva* and *Ancillaria*. The shells are very numerous; the large *Voluta Lamberti* is obtained there.

The age of the earlier kings who sprang from Hugh Capet, is here illustrated. The weak princes such as Robert the pious, may be represented by the overgrown Molluscs; while the greater, such as Philip Augustus, are represented by the powerful Quadrupeds above mentioned; and the Norman conquests beyond sea, are typified by the Cetacea.

The Belgian and British Miocene, are classed together by Sir C. Lyell, in his admirable "Elements of Geology" (1865,

p. 232); a work which gives a more complete and perspicuous view of the science, than any similar treatise, and which is more entitled to the name of "text-book" than any work so called.

The Lower-Miocene of Belgium, which occurs in the neighbourhood of Rupelmonde, ten miles from Antwerp, somewhat resembles the London-clay. It abounds in Septaria and shells of marine genera, such as *Nautilus*, *Corbula*, *Pleurotoma*, *Pecten* and *Cassidaria*. Teeth of genera allied to sharks as *Carcharodon*, *Lamna* and *Oxyrrhina*.

The Upper-Miocene of Belgium or Diest-Sands, contains few organic remains. Of these the shells of the *Terebratula grandis*, are the most conspicuous. Nyst, quoted by Lyell (p. 232), considers these Diest-Sands, contemporaneous with those of Edgehem. A considerable number of fossils are found in the Edgehem-beds, as Crinoids, Molluscs and Zoophytes. The supposed contemporary in Britain of the Diest-Sands, is the Ferruginous-Sands of the North-Downs in Kent.

The Upper-Miocene of Boldersberg in Belgium, resembles the Faluns of Touraine. The shells found therein are of marine and tropical genera, such as *Conus*, *Ancillaria*, *Pleurotoma*, *Cancellaria* and *Oliva*.

The Belgium and British Miocene strata, classed together, may typify the Belgæ amongst nations, who are found in both countries. The molluscs illustrate the lower populations, and the sharks the Counts of Flanders, of whom came Matilda the wife of William the Conqueror.

The Miocene formations of Germany are important. Those of the Mayence-basin, contain the remains of many marine shells, part of which are of similar genera to those now found in European seas, as are *Aporrhais* and *Pectunculus*. The "Sands of Epplesheim" are situated near the Mayence basin, they contain remains of the great quadruped *Dinotherium*.

The Littorinella-limestone, so called from its being almost entirely composed of these small shells, contains among the remains of other animals, those of *Hippotherium gracilis*, *Acerotherium incisivum*, *Paleomeryx* and *Chalcomys*.

The Upper-Miocene of the Vienna basin presents in its Organic-remains, a certain resemblance to the Falunian-sands of Touraine. The shells of Mollusca are there very numerous indeed, and many of these are identical or nearly so, with recent exotic species. In the lowest marine beds of the Vienna basin, says Lyell (p. 242), species of *Dinotherium*, *Mastodon*, Rhinoceros, *Listriodon* and the extraordinary Nummulite *Amphistegina Hauerina*, D'Orb., are found.

The plants are certainly not like those at present living in

Europe; but consist of Cinnamons, Cassias, *Platanus* and *Myrica;* plants that now exist in the tropics.

The Miocene-formations of Germany, split up as they are into local divisions, illustrate the Germanic states, as those of Vienna and Mayence.

The great animals allied to the Elephant and Rhinoceros, typify the members of the House of Hapsburg. Those having *one* horn or tusk such as the one-horned Rhinoceros, typify absolute power in the monarch; while those having *two* horns or tusks, illustrate the personal union of two crowns under one head, as has been continually exemplified in Austrian history.

The civilization of Germany in the middle ages, has often been said to be Oriental in its character; like the Fauna and Flora of the Miocene-age of that country.

The resemblance between the Upper-Miocene and the Touraine-Faluns, is typical of the alliance between the Hapsburgs and the French princes, some of whom fixed their Court at Tours. The Lower-Miocene formations, perhaps generally represent the tenth, eleventh, and twelfth centuries; while the Upper-Miocene represents the thirteenth, fourteenth, and a portion of the fifteenth centuries.

The Lower-Miocene beds of Croatia are highly interesting, a brown-coal is overlaid by strata abounding in shells of similar marine species to those of the Vienna-basin. Beautifully preserved plants, such as palms and poplars, occur in hard marlstone, with many insects, dragon-flies, grasshoppers, butterflies and termites. This brown-coal is lignite. The plants and insects are decidedly of Oriental forms; typical as has been before remarked, of Oriental proclivities in a nation.

The Miocene-strata of Switzerland have been greatly studied, and have afforded much instruction; they are otherwise called "*Molasse*," and have been arranged in three divisions; two fresh-water, and one marine. The marine and one of the fresh-water divisions in their organic remains, resemble the Faluns of Touraine. They are therefore referred to the Upper-Miocene. The Lower-Miocene is represented in the other division of these fresh-water strata.

The Lower-Miocene or Lower-Molasse of Switzerland, is of fresh-water formation, and is distinguished for the number of remains of plants it contains. It is subdivided into Upper and Lower.

The Upper-division of the Lower-Molasse, presents a resemblance to the Mayence strata, as the Lower subdivision does to the Aquitanian. Many plants similar to those living in North America, may be instanced, as the *Liriodendron procaccinii*, which resembles the tulip-tree—*Liriodendron tulipifera*, and

cornels, buckthorns, cypresses and fan-palms are likewise found embedded in these strata; while their living allies are now in America.

The Lower-subdivision of this Lower-Molasse, is of fresh-water origin principally, but a few marine-shells are intermixed; such as *Cerithium margaritaceum* and several others. This mixture of fresh-water and land-shells, always implies great terrestrial convulsions.

This Lower-division of the Lower-Miocene of Switzerland, contains remains of fig-leaves, which retain a large portion of their carbon. A long list of other remains of plants, might be quoted from among the reeds, conifers, ferns and *Protaceæ*.

There has been much controversy on the subject of the degree of difference, between the Miocene plants of Switzerland, and those now recent. Some hold with Professor Heer, as mentioned by Lyell (El. p. 262), that many of the species now living, may be the lineal descendants of those found in the Miocene-strata of Switzerland. The believer in the doctrine of the transmutation of species, would argue that the differences between the approximate species, recent and fossil, are to be accounted for by his favourite theory. A doctrine greatly fostered by the superstition, so general with regard to the supposed origin of species from *single* individuals or pairs, with one or two admitted exceptions.* VARIETIES WERE AS LIKELY TO BE CREATED AS SPECIES, ESPECIALLY AT LOCALITIES AFFORDING DIVERS GEOGRAPHICAL CONDITIONS.

The plants of the Swiss Miocene-strata, although found over only a small portion of the area of Switzerland, give evidence of a more numerous Flora, than at present exists in all that country. Three thousand flowering plants are believed by Professor Heer to have existed in the Miocene age, in Switzerland. This is a number far greater than now accompany, even the diversified elevations in that country. No part of Europe, yields so great a number of plants within so narrow an area; nor do the Southern States of America with their semi-tropical climate. It may take rank with the richest portions of the West Indies or Brazil. The resemblance is great as a whole, between the American-Flora, and that of Switzerland in the Miocene-age. This resemblance is less with the recent Flora of Europe, Asia, Africa and Australia. A theory has been worked out, of a "Miocene Atlantis" or territory between Europe and America over which these Miocene plants are supposed to have passed; which would involve a migration of plants, similar

* The theory of the origin of species (except man) from single pairs, finds no countenance in the Bible.

to "the migration of animals." This theory in this connexion carries us at once to the land of fable and walking trees.

The Miocene-strata of Switzerland is typical of that country in mediæval times. The cultivation of religion and morality, by the Albigenses and Waldenses among the passes of the Alps in the Middle-ages, are "the green spots" in the comparatively barren-field of Mediæval Church-history.

The geologist sees in the Miocene-strata of Switzerland, the realization of his dreams of a "Paradise of Plants:" as the moralist when he examines the history of these sects in early times, sees a luxuriant growth of the domestic and Moral virtues. The physical convulsions which brought the Miocene-strata of Switzerland to its present condition, may typify the forces, used for the subjugation of the Waldenses by foreign conquerors.

The Upper-Miocene strata of India, are highly important. The Siwâlik or sub-Himalayan hills, attain the height of 3,000 feet. Their strata are sandstone, shingle, clay and marl. Dr. Falconer, Sir Proby Cautley and others, have investigated these strata, and discovered many fresh-water shells, with the remains of important mammals and reptiles, in great variety. Such as the *Anoplotheria*, *Chalicotherium*, allied to the Rhinoceros; and the *Hexaprotodon* allied to the Hippopotamus; species of the *Hippotherium*, *Mastodon*, monkeys, giraffes, stags and antelopes, and the extraordinary four-horned *Sivatherium*, with the *Hyænarctos*, allied to the bear and the hyæna, and the *Enhydriodon* which resembles an otter of extraordinary size. To these we must add the *Machairodus*, a large animal allied to the cats. Ostriches are likewise found, which appears to argue the presence of a flat-country where hills now exist. Large lizards also once lived there, and a wondrous tortoise, estimated to have been 12 feet 3 inches long, by 8 feet broad and 7 feet high. This has been named, *Colossochelys atlas*. A few fresh-water shells found in these strata, have survived as species to the present day.

These strata in India illustrate Indian Mediæval-history. The shells which have come down to us, are like the relics of the ancient civilization of India. Much has passed away, illustrated by the extinct species; some are preserved, which may be typified by those species which exist in India in a recent and fossil state.

The larger animals now extinct, may represent the barbarous Dynasties which have passed away. The Pachyderms may illustrate the Moguls, some of whom like the Rhinoceros, are still recent, and may typify the later Emperors of Delhi. The *Sivatherium*, may represent rulers among the Brahmins; while

the mountaineers and hill savages, are illustrated in the hyæna-like bears, before mentioned. The ostrich, the camel and the giraffe, typify the fleet messengers, who in mediæval times, trod the sands of India.

The Pliocene-formation is better represented in Britain than the Miocene. It is divided by Lyell into Newer and Older-Pliocene.

The Older-Pliocene strata of England are divided into the White or Lower-Coralline-Crag, and the Red or Upper-Crag of Suffolk. The White or Coralline-Crag abounds in shells of Molluscs, corals, Bryozoa and Echini. All these organic-remains are immensely numerous; such as the *Astarte Omalii*, Lajonkaire, *Voluta Lamberti*, and *Pyrula reticula*.

These remains being all *marine*, typify maritime habits in a Nation. The fact of their belonging to the lower divisions of Organic-life, is suggestive of the lower state of civilization attained in the districts where this Crag abounds, as contrasted with the Metropolis, which although presenting older strata, contains more advanced forms of life.

The Black-Crag of Antwerp much resembles in its fossils the Coralline-Crag of England.

The Pliocene-formation in England, may illustrate that period of history which is partly mediæval, and partly modern; —through the reigns of the Houses of York, Lancaster, and the Tudors. That portion entitled "the White-Crag," may illustrate English history, from the Saxon-period, to that of the Norman and Plantagenet-kings. The Tudor-period is much more distinct in English history. It is illustrated in the Red-Crag of Suffolk.

The comparatively small number of large fossils in the White-Crag, may typify the low state of arts and manufactures, in mediæval times.

The Red-Crag of Suffolk, or Uppermost of the Older Pliocene-strata, owes its bright yellow colour to the peroxide of iron it contains. It consists of quartz and sand, stained of a rich ferruginous colour. It contains many fossils, of which the most remarkable are the *Fusus contrarius*, *Purpura tetragona*, the recent *Nassa granulata*, and the recent *Cyprea europæa*. Remains of whales, such as *Balæna emarginata*, Owen, teeth of Rhinoceros, Tapir and Mastodon, *Carcharodon*—a gigantic shark, and *Myliobates* of the skate-family, are also found.

These great shells, may illustrate the "middle classes" in the bloodiest portion of the reign of King Henry VIII. Most of the fossils of this formation being stained *red*, may illustrate extensive shedding of blood throughout the country, both by executions and wars. Charles Brandon Duke of Suffolk was one of the most important characters at this period.

The reversed-whelk (*Fusus contrarius*) may typify the crooked policy of the mercantile classes, which would appear monstrous if viewed in the light of modern economic science. The gigantic sharks and formidable skate, illustrate the grasping courtiers of the reign of Henry VIII. The skate may be compared with flat-faced chancellor Cromwell.

The Rhinoceros with its "little horn," may typify the Pope and his great supporter Cardinal Wolsey; while the Tapir may illustrate the less prominent bishops, and the great Mastodon,—the monarch Henry VIII.

The mental inactivity of "the Middle-ages" in Britain especially, is typified by the White-Crag. The Antwerp-Crag is said to be of the same age as the Red and White-Crag of Suffolk, and may illustrate an analogous period of history.

The Newer-Pliocene of England, is divided into the Bridlington and Chillesford-beds, and the Norwich-Crag.

These strata in England may typify the period of the Stewarts, as the Older-Pliocene does that of the Tudors. The Bridlington and Chillesford-beds, believed to be about the same age, contain numerous recent and fossil shells; such as *Nucula Cobboldiæ*, and *Tellina obliqua*. In the Chillesford-beds, are found *Cardium grœnlandicum*, *Lucina borealis*, *Cyprina islandica*, *Panopœa norvegica*, and *Mya truncata*—shells which are now found in the Arctic seas. The fossils of the Bridlington-beds, are similar but more exclusively Arctic in their character. Hence they illustrate the commencement of Arctic explorations, which first occurred in the days of the Stuarts. The whale fishery, then began to attract the attention of English navigators.

The Norwich-Crag is of a bright yellowish-colour. It contains a great number of fossils; among them many species now found in the British seas such as *Fusus striatus*, *F. antiquus*, *Cardium edule*, *Cyprina islandica* and *Turritella communis*. Which last shell resembling a little tower, may illustrate some of the steeples of Sir Christopher Wren.

The Norwich-crag as a whole illustrates the latter period of the Stuarts, who were partly contemporaneous with those who succeeded them; as part of this Newer-Pliocene is contemporaneous, with the so-called Post-Pliocene which is rightly classed later.

The *Mastodon arvernensis* may typify William of Orange, the most powerful Prince of the period, who reigned in these Islands. The fossils of this period are *stained Orange*, the colour of William's party.

The Newer-Pliocene of Ischia, contains many fossils such as *Murex vaginatus*, and *Buccinum semistriatum*. The first is still

recent, as a rare shell. Monte-Somma an old cone of Vesuvius, contains fragments of "Tuff,"—a stratum similar to that "of Ischia." The Eastern-base of Mount Etna, belongs to the Newer-Pliocene; it contains many shells, of which a moderate portion are identical with species now living.

The Newer-Pliocene of Sicily, extends over a large part of that Island. The greater portion of the shells in this formation, are to be found living in the seas of the present age, such as oysters, and a common coral now found in the Mediterranean, *Caryophyllia cæspitosa*, Lam. The *Pecten jacobæus*—that fine bivalve, is still found in the European seas, as also in the Newer-Pliocene of Sicily.

These rocks which form so large a part of the strata of Sicily, being of this modern date, and containing so few fossils of the higher orders of animals, typify the backward civilization of Sicily. The same may be said of the strata of Etna, Ischia and Vesuvius, which owe their elevation so much to volcanic agency; which illustrates the *sub-rosa* methods of accomplishing ends. These strata do not yield fossils of vigorous classes, genera or species, which points to a comparatively lethargic Human population.

The Post-Tertiary formation, according to Lyell's arrangement and that of other writers, is made to include extensive and divers strata. It is subdivided into the Post-Pliocene and Recent.

The earliest formation of the Post-Pliocene, is the Glacial-Drift of various countries. That of Norfolk is very important. The very name "Drift," applied to these strata is indicative of great irregularity.

If we examine a section of the coast of Norfolk, from Happisburg to Cromer, as it extends for forty or fifty miles, we find the strata in the following order. Firstly the Chalk and flints. Secondly the Norwich-crag. Thirdly the Forest-bed, where the roots of the trees, remain attached to their stumps in the vegetable soil in which they grow. Fourthly an important brackish-water series, accompanied by beds of lignite, and afterwards layers of fresh-water and marine-strata of sand and clay, and the shells of Mollusca, which are identical with recent species.

After this a fifth stratum of blue-clay, without Organic-remains, underlying the clay and boulder strata of the Glacial-age. Sixthly Drift much contorted, and lastly sand and gravel of superficial origin.

In the Forest-bed above mentioned, the remains of three species of the elephant are found, *Elephas primigenius*, *E. meridionalis*, Nesti., and *E. antiquus*. With these are found

the remains of *Rhinoceros etruscus*, *Hippopotamus major*, and *Sus scrofa*. Of the horse, bear, wolf, bison, Irish elk, reindeer, beaver, narwhal and walrus; some are extinct; while others are still living.

The brackish-water-series, contains masses of granite, syenite and other rocks, foreign to the locality where they are found. Some even being supposed, to have been brought from Scandinavia.

The layers of divers strata above mentioned, illustrate "strata" in human society. This is more or less true, as a great analogy, deduced throughout all geology. But the variety of layers in this Norfolk-drift, typify the numerous classes and their admixture, which was more characteristic of the age of the House of Hanover, than at any earlier period. The different classes of English society in those days, were formed of other classes more powerful in former times; which in some cases disappeared, and were replaced by these classes of later formation. In like manner, such strata as the Norfolk-drift, were formed of strata of earlier-formation.

The Glacial or Drift-period in Canadian geologic-history, is said to show a great resemblance to that of Europe. The different ancient strata of which it is formed, may typify the ancient Indian tribes, who were broken up, in the days of the House of Hanover.

The mountains of the Northern part of the Principality of Wales, are generally believed by geologists, to have been the centre of a great system of glaciers, which have been extinct for ages. These are believed to have occupied the seven valleys extending in various directions; to have been the means of diffusing fragments of rocks over localities to which they did not properly belong, and have left their traces over the ground, these floating islands traversed.

In the Drifts of Moel Tryfaen, Mr. R. D. Darbishire, as related by Lyell (Manual, p. 158), in 1863, discovered the shells of fifty-four species of Mollusca, and three Arctic "forms of species." All these were of species now living in the British or Arctic seas; the greater number being now found at a higher latitude. These fossil-shells, are found at an elevation, as high as 1,360 feet. This would prove the great elevation of the ancient sea-level.

Scotland has also its Glacial-period, which has greatly modified the features of the country. There is reason to believe that the Grampians were once occupied by a great Glacial system, which extended its ramifications in most directions. Large masses of ice, were doubtless the means of conveying to the coast much foreign strata, and many Organic-remains.

The shells which accompany the Scottish Drifts are very varied and indicate an Arctic climate, or one at least colder than that now existing in Scotland.

We may mention among the Drift-shells, *Pecten islandicus*, *Leda oblonga*, *Saxicava rugosa*, *Astarte borealis*, *Natica clausa*, and *Trophon clatheratum*, all of which are now found alive in the Northern seas. Extreme cold does not prevent the development of life, at least in certain classes of animals. Lyell mentions (p. 154) that Dr. Hooker found Crustacea, Mollusca and Serpula at depths of 200 and 400 fathoms, off Victoria land, between latitude 71° and 78° South.

The Scotch have not less *vitality* than other nations although *apparently* a cold people.

There are numerous tracts of land in Russia and Scandinavia, which show evidences of having passed through the Glacial period, besides those which present recent glaciers.

The polishing which the rocks receive in passing, by contact with icebergs and their freight; illustrates the impression made on society by those divisions of the population, who come down from the mountainous districts, but who lose much of their individuality thereby. This was especially true in the days of the House of Hanover, who witnessed the Union of the Three Kingdoms; and who also saw the disappearance of a great portion of that bitter feeling of antagonism among sections of the population, who were either of different origin, or had been long isolated.

Such a change was preceded by a still greater aversion, than existed in more quiet times. This was a period of doubt and uncertainty, analogous to that of "Drift;" but we were nevertheless in this historical period "drifting" towards a more complete constitutional or popular government, whose divers elements may be illustrated, in the apparently confused strata of the "Drift," which presents many contradictory elements.

Limestone caverns are pretty numerously found in England, they frequently contain the remains of Man and animals intermixed, so as to lead many men of science to believe, that Man was contemporaneous with such animals as the cave-bear (*Ursus spiletus*), *Rhinoceros tichorinus* or woolly Rhinoceros, *Hyœna spiletus*, and lions. Flint implements which bear evidence of having been fashioned by Man, frequently accompany his bones, and those of most, if not all of the above-named animals. In some cases the floor of the cave inclosing these relics, is in a manner sealed with stalagmite.

If we are to admit that the Human-period commences here, it may illustrate the age when "the Rights of Man" first began to occupy attention; but this was an age when his "heart was

as hard as stone." The mementos of those days are as imperishable as the stone weapons, and will go down comparatively unchanged to the remotest time.

The fluviatile-mud, is that substance to which many tracts of country owe their furtility. No description of strata is less fully formed, or more in *course* of formation than this. This is called on the Rhine "Loess," and contains numerous land and fresh-water shells, similar to those at present in being. Such as *Succinea elongata, Pupa musicorum, Helix plebeia,* and *H. nemoralis.*

This *descent of mud,* may typify the influence which nations in the neighbourhood of the course of a river, have on those nearer the sea.—Switzerland and those parts of Germany which adjoin the Rhine, much influence France and Holland.

The Post-Pliocene-period is an age, in which man is supposed to have existed contemporaneously, with the mammoth, the *R. tichorinus,* and with species of *Ursus, Felis* and Hyena. The flint weapons which accompany these remains, and which are apparently fashioned by Human-hands, present a great difference from those ground flints, which are usually assigned to the Celtic period. They are merely chipped by knocking against each other, and show a resemblance to those now used as hatchets, in some Islands of the Indian Archipelago. This subject is still *sub-judice,* and too uncertain, for us to attempt to found any analogy thereon.

We are now to consider the Recent-strata, or those in which the remains of animals and plants, are found of species identical with those now extant. To this period belong the so-called "Stone, Bronze and Iron ages of society," which have perhaps been in some instances, rather too hastily and distinctly defined.

This classification, appears to be essentially thus. Firstly the age of Stone-weapons and their accompaniments the skulls of a short-headed race, which have been termed "the Brachycephalic type," and which are clearly allied to those of the Mongolic race. These the author thinks to have been those Finns, relics of whom are still found in outlying districts of Great Britain and its Islands. Secondly the Age of Bronze—that of the short-headed Celts; which we think to have been that of the Iberians and of Celtic nations, before they were much influenced by the Romanic-elements. Thirdly the Age of Iron, that of the wedge-headed Celts, "the Dolichocephalous type." This was the age of the Celts, when intercourse with more civilized nations had taught them the use of iron. These Celts are probably the Gaelic type, for their skulls are *wedge-shaped.*

The Stone-period typifies the greater use of stone in roads, in houses and for ornamental purposes at the commencement of the present century than in the two following generations.

The Bronze-age exemplifies the greater use of brass thirty years ago than at present.

The Iron-age, is acknowledged to be pre-eminently that of our own day. IRON IS NOW TAKING THE PLACE THAT BRASS, BRONZE AND STONE FORMERLY DID.

AN EPILOGUE.

BEHOLD the vast sea! Behold the waves roll,
To the shore, to the shore—is their goal.
And every wave revolving—breaks the coast,
And every ebb returning, swells them most,
Thus steps of progress in Creation's plan,
The Axis of Creation turns on Man:
Throughout the ages—long before his birth,
Before the age of life was born on earth,
Right from the bowels of "*our Mother Earth.*"
Progress glides onward as the rushing wave,
Makes for the land—its master and its slave.
And as a giant pouring out his soul
Stakes his last drop of life—gives up his whole.
And he must conquer—"conquer if he die."
The contest rages; and with one drawn sigh
He stops for breath—the breath that's near his last,
And gathers all his strength, though life may fast
Slip from his mighty grasp—but this one *gasp*,
Has been the turning-point in all his life.
Even with this drawback, and with death so rife
Approaching, his was a life of progress still
He never turned his back, but faced the ill,
But might recede a step, just as the waves
When tide is coming in,—ever flowing
Sometimes stepping back, when strength is growing.
The impetus that grinds the pebbled beach.

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ETHNOLOGY AND ZOOLOGY.

PL. I. (*to face p.* 65).—*Photo* 1. Wallachian. 2. Man like an elephant, from Lavater. The individual mentioned in page 320 was much like this. Lavater calls it a portrait of a miser. 3. Tamil and Teloogoo catechists. 4. American-Indian woman and half-bred girl. 5. Heifers, from nature.

BOTANY AND ZOOLOGY.

PL. II. (*to face p.* 89).—Trees in Leigh Woods, Somersetshire; Elms, Cotham grove. This magnificent grove of trees we grieve to say will soon be cut down.

PL. III. (*to face p.* 96).—*Photo* 1. Fordingale Yew, said to be 2,600 years old; 2. Beech at Windsor; 3. Cup-moss (*Scyphophorus pyxidatus*, Hooker) from nature; 4. Lime in Moore park; 5. Chipstead elm; 6. Conferva nana, after Sowerby; 7. Moccas park oak. *Photos* 1, 2, 4, 5, 7 are from the plates in Strutt's "Sylvia Britannica."

PL. IV. (*to face p.* 97).—Tintern Abbey, west front. (See ivy, p. 98.) The custodian assured the author, that the Abbey suffered greatly in consequence of the ivy growing deeply into the stone; and he expected it would be all down in a few years.

PL. V. (*to face p.* 112.), BOTANY AND ZOOLOGY.—*Photo* 1. *Atropa belladonna*, after Woodville; 2. Socotrine aloe (*A. socotrina*), after Woodville; 3. Death's-head hawk-moth (*Acherontia atropus*), from nature; 4. Cone of cedar of Lebanon and pod of carob, from nature; 5. Molucca crab (*Limulus* species) and *Musca Cæsar*. Some of the untouched photos of this fly show a faint trace of the original green and blue colours of the fly. 6. Carboniferous plants; 7. Portuguese man-of-war (*Physalia utriculus*, &c.).

Pl. VI. (*to face p.* 120), Lower Forms of Life.—*Photo* 1. Sea anemones; 2. Diatoms; *Gomphonema capitatum* and *elongatum; Diatoma vulgare; Achnanthidum lineare* and *coarelatum; Amphitetras antediluviana*, front view; *Orthosira spinosa*, front view, with globular and oval forms, found at Springfield, Barbadoes. After Hogg.

Photo 3.—Hydra on a stalk of Anacharis.

Photo 4.—1. *Porpita pacifica;* 2. *Velella lata;* 3. *Velella cyanea;* 4. *Physalia utriculus*, after Schmelz.

Photo 5.—Foraminifera from limestone, and *Polystomella crispa*, recent, after Hogg.

Photo 6.—1. *Volvox globator;* 2. A section of volvox showing the ciliated margin of the cell; 3. A portion more highly magnified, to show the young *Volvicinæ* with their nuclei and filamentary attachments; 4, 5, 6, and 7. *Confervoidæ*, showing their modes of growth.

Photo 7.—*Pentacrinus caput medusæ*, after Fort Major Austin.

Pl. VII. (*to face p.* 152).—Insects, from nature.

Pl. VIII. (*to face p.* 160), Fish.—*Photo* 1. Sword-fish (*Xiphias gladius*), after Acarie; 2. Hammer-shark (*Zygæna malleus*) and Saw-fish (*Pristis antiquorum*), after Acarie; 3. Sturgeon (*Accipenser ruthenus*) and Chimæra monstrosa, after Acarie; 4. Mackerel (*Scomber scombrus*) and Tunny (*Thynnus vulgaris*), after Acarie; 5. Coryphene (*Coryphena*) and Pilot-fish (*Pompilius*), after Acarie; 6. Perch (*Perca fluviatilis*), after Oudart.

Pl. IX. (*to face p.* 184), Fish and Reptiles.—*Photo* 1. John-Dory (*Zeus faber*) and Boar-fish (*Capros aper*), after Acarie; 2. Fishing-frog (*Lophius piscatorius*), after Acarie; 3. *Testudo radiata*, after Klein; 4. Iguana (*Lacerta iguana*), after Klein; 5. *Testudo*, sp.; 6. Vipers (*Pelias berus*), after Klein.

Pl. X. (*to face p.* 225).—Anne Hathaway's Cottage (wife of Shakspear); Arch of a Confessional; Chepstow Castle.

Pl. XI. (*to face p.* 240), Relics of the Dodo.—*Photo* 1. Skull of Dodo at Oxford; 2, 3. Dodo at Vienna; 4. Head of Dodo at Oxford, showing the skin; 5. Foot of Dodo in the Brit. Museum. The above from Strickland.

Pl. XII. (*to face p.* 240), Relics of the Dodo and Solitaire.—*Photo* 1. Copied from Sir T. Herbert's figure; 2. View of the Island of Mauritius, where the dodo once existed; 3. View at Rodriguez, where the Solitaire once existed; 4. Dodo, from a picture by Savery at the Hague; 5. Bones of Solitaire; 6. Skeleton of Dodo, from the Oxford specimen. All the above copied from Strickland and Melville's work.

Pl. XIII. (*to face p.* 240), Relics of the Dodo.—*Photo* 1. Dodo, from Clusius; 2. Solitaire, from the only known representation in Leguat's work; 3. Leguat in his Island; 4. Dodo, after Savery; 5. Bones of the Dodo; 6. Bones of Solitaire. All these are from Strickland's work.

Pl. XIV. (*to face p.* 240).—*Photo* 1. In the collection of the author; recently discovered at Mauritius and named by Prof. Owen as *femur*, *tibia*, *fibula*, and *metatarsus*. The dodo was first described by Van Neck, who in 1598 visited the Mauritius. Clusius (Exotica, 1605) figures the dodo, which latter we have copied in plate XIII. as Sir T. Herbert's, who visited the island in 1527. The dodo was seen alive in England by Sir Hammon

L'Estrange (see Wilkinson's ed. of Sir T. Brown's Works, vol. i. p. 391) The foot and head of the specimen now in the Oxford museum came from the Tradescant collection through Ashmole. The head and foot at Oxford, a foot in the Brit. Museum and head at Copenhagen, were until recently the sole known relics of the dodo; but a number of bones were discovered by Mr. George Clarke at Mauritius. The Solitaire of Rodriguez has been similarly extinct in the memory of man, but its relics are even rarer than those of the dodo; almost the sole notice we have of it is in the work of Leguat.

Pl. XV. (*to face p.* 248).—*Photo* 1. Dodo; 2. Moorhens, from stuffed specimens; 3 Skeleton of osprey, from nature; 4. Great auk, from nature.

Pl. XVI. (*to face p.* 248), Birds.—*Photo* 1. *Columba porphyrio*, after Traviès; 2. Bittern (*Ardea stellaris*), after Traviès; 3. Cockatoo (*Plyctolophus sulphureus*), after Traviès; 4. Smew (*Mergus albellus*); 5. Great auk (*Alca impennis*), from a specimen in the Brit. Museum; 6. Hornbill *Buceros rhinoceros*), after Traviès.

Pl. XVII. (*to face p.* 264), The Resemblance between Man and Animals.—*Photo* 1. Dr. Beecher and the lion; 2. Emperor Maximilian and the eagle; 3. Frenchman and frog; 4. Boy and rhinoceros; 5. Man and Camel; 6. Negro, whom Redfield gives as the prototype of the elephant; 7. Aztec dwarf.

Pl. XVIII. (*to face p.* 280), Quadrupeds.—*Photo* 1. Kangaroo (*Macropus majus*, Shaw), after Schuler; 2. Brown bear, after Cuvier; 3. Beaver, after Roulin; 4. Zebra, after Roulin; 5. Pangolin, after Huet; 6. Walrus, after Pallas

Pl. XIX. (*to face p.* 289).—*Photo* 1. Turk and Turkey-cock; 2. Man, in which it is not difficult to trace a resemblance to a pig. 3. This is believed to be a portrait of an American lady, who attended a recent meeting of the British Association for the Advancement of Science; and is considered by Redfield greatly to resemble the elephant. 4. Cows. The man and woman opposite (5) resemble these animals. The preceding plates and following are copied from a clever work, entitled, "Comparative Physiognomy; or, the Resemblance between Man and Animals," by Dr. James Redfield of America, published 1866. The author is pleased to observe the coincidence between some few of his observations and Dr. Redfield's; but the line of thought pursued by Redfield is confined to the resemblance between man and animals. A critique on his work by the author will be found in the *Anthropological Review* for April, 1868, Art. Physiognomy. But he was not aware of the existence of this work until his own was ready for publication.

Pl. XX. (*to face p.* 304).—*Photo* 1. Man and donkey; 2. Man and goat; 3. Man and owl; 4. Man and ostrich; 5. Father Matthew and the dog; Man and horse.

Pl. XXI. (*to face p.* 320).—The resemblance between man and animals, copied from "De Humana Physiognomania Baptistæ Portæ," 1650.

Pl. XXII. (*to face p.* 320), Zoology.—*Photo* 1. Skeleton of osprey, after Roulin; 2. Tiger; 3. Bottle-nosed whale, from an original drawing by W. H. Baily; 4. Civet, after Roulin; 5. *Mus coipus*, after Traviès; 6. Kite, after Traviès.

PL. XXIII. (*to face p.* 377).—Crooked Fall, Vale of Neath, by Mr. John Taylor; Tintern Abbey reflected in the water.

PL. XXIV. (*to face p.* 377).—Conway Castle reflected in the water.

PL. XXV. (*to face p.* 416).—Eve at the Fountain, from the original statue in the Bristol Institution by E. H. Baily, R.A.

GEOLOGY.

PL. XXVI. (*to face p.* 432).—*Photo* 1. Carboniferous fossils: *Lepidodendron obovatum; Calamites approximatus; Stigmaria ficoides.*

Photo 2.—From the Upper chalk of Sussex, *Pticodus decurrens* (1); *Cidaris marginata* (2); *Pecten striatitulus* (3); *Plagiostoma spinosa* (4); *Rhynchonella plicatilis* (5); *Terebratula semi-globosa* (6); *Belemnitella mucionatus* (8).

Photo 3.—Tooth of *Mastodon ohioticus*, in the collection of the author.

Photo 4.—*Pterodactylus crassirostris*, Solenhofen.

Photo 5.—Jaw of *Hyæna spiletus*, from Kent's Hole.

Photo 6.—Lias. *Avicula cygnipes* (1); *Acrodus nobilis* (2); *Gryphæa incurva* (3); *Ceradotus giblus* (4); *Pentacrinus briareus* (5); *Pholidophorus Bechii* (6).

Photo 7.—Silurian: *Periechocrinus articulosus* (1); *Calymene Blumenbachii incurva* (2); *Euomphalus catillus* (3); *E. rugosus* (4). Tertiary: *Mylobates* (1); Fish-spine (2); *Voluta* (3); *Nautilus* (4).

PL. XXVII. (*to face p.* 433).—Exeter Cathedral, built of New red sandstone.

PL. XXVIII. (*to face p.* 432).—Wells Cathedral, built of Inferior oolite.

PL. XXIX and XXX. (*to face p.* 456).—Skull of *Rhinoceros tichorinus*, in the collection of the author; this was sent from Siberia; a woodcut and full description of it, are to be found in "Land and Water," 1 Feb., 1868.

PL. XXXI. (*to face p.* 448), GEOLOGY.—*Photo* 1. Tertiary: *Astarte bipartite;* Balanus on whelk; *Nassa elongata; Fusus contrarius; Buccinum Dalei; Pyrula reticulata.* Oolite: *Ammonites jason; Pleurotomaria elevata; Ammonites Brocchii, Rhynchonella serrata; Hemicidaris intermedias; Ostrea gregaria; Trigonia incurva; Apiocrinus rotundus.*

Photo 2.—Porphyry; Granite; Serpentine; Chalcedony; Petworth marble.

Photo 3.—Slab of Wenlock limestone. Secondary fossils: *Turritella granulata; Turbo moniliferus; Terebrirostra lura; Natica caurena; Cucullæa fibrosa; Terebratula, Exogyra conica; Ammonites interrupterus; Turritellus costatis; Ancyloceras Phillipsii.*

Photo 4 and 8.—*Lepidotus minor.*

Photo 5.—*Holoptychius Flemingii.*

Photo 6.—Tertiary: *Cassidaria echinophorus; Cerithium; Conus antiquus; Lamna; Planorbis euomphalus; Unio solandi; Lamna; Cacharodon; Ancillaria buccinoides.*

Photo 7.—*Ichthyosaurus communis.*

PL. XXXII. (*to face p.* 449).—Stonehenge, from a photograph by Mr. J. Taylor.

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EDITED BY

C. O. GROOM NAPIER,

Author of "The Book of Nature and the Book of Man;" "The Food, Use, and Beauty of British Birds;" "Tommy Try;" and Seventy Papers and Tracts on Literature and Science.

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land an army within seven miles of the capital.

On reaching the gates of the city the Saracens were disappointed to find that enough of the old Roman spirit still remained in the soldiers who garrisoned it, combined with the strength of the walls, to withstand them successfully. The Greeks also possessed an agent in the celebrated fire which they managed to pour upon their assailants, and which helped them to defy their foes for many centuries. Tradition ascribed a miraculous origin to this substance, but the discoveries and usages of modern life ascribe it to nothing more mysterious than naphtha or petroleum, which the Greeks forced in a flaming condition through long metal tubes, and so cast the deadly liquid to a considerable distance. The Saracens thus repelled, retired during the winter to a neighbouring island where they had placed their stores, and for seven successive summers returned to assail the city, only to meet with a like repulse and disappointment.

The most renowned of their warriors who fell fighting under the walls of Constantinople was the aged Abu Ayub, who had fought by the side of Mahommed himself. Many centuries after this, when the Mahommedans got possession of the city, the spot where he was buried was said to be miraculously revealed, and a mosque being built thereon, every successive Sultan has been brought to it to be there invested with the insignia of his office. Attempts of conquest afterwards proved futile, till the time came, fixed in the destiny of the city and its conquerors.

As early as the tenth century the Russians, who came to Constantinople for the purposes of trade, cast envious eyes on the city. The sight of the luxuriant arts and remains of her ancient splendour, together with the growing weakness of the government, seemed to tempt the cupidity of these northern tribes, and the vulgar even then believed in an ancient prophecy that in the last days Constantinople was destined to fall into the possession of Russia.

The highlands of Asia, between Siberia and China, were from an early period occupied by many tribes which are frequently designated by the general name of Tartar. These comprehended Moguls or Mongols, Turks, and Huns. For long they were tributary to China; but even before the Christian era they had become formidable to all the countries in their neighbourhood. In peaceful times they were pastoral in their habits. In the fifth century, under the fierce Attila, the Huns ravaged Western Asia, and proceeding to Europe, threatened the entire extinction of the Roman empire. Thus in these early days the Tartar element became mixed with many Eastern European nations and especially with the Russian and Sclavonic tribes of Central Europe and what are known as the Danubian provinces. In after times these nations also received further accessions of Mongols and Turks. Therefore, it is well to remember that there is a large mixture of tribes in Russia of the same origin as those which compose modern Turkey. It was under Ghenghis or Zengis, in the twelfth century, that a vast horde of these tribes poured over Asia and into Eastern Europe, carrying desolation everywhere, and leaving many of their numbers to mix with the former inhabitants and alter the character of their nationality. Batou, the grandson of Ghenghis, with half a million of soldiers, from his home in North Central Asia, set out on a career of blood and devastation. A fourth of the circumference of the world was passed during six years of travel, and every country on the way had to submit, till at length Russia was reached. The army spread from Livonia to the Euxine, destroyed

Moscow and Kiew, the ancient capital, and remained masters of the country. Thus was Russia farther incorporated with Tartar tribes. Much destruction was wrought in Germany and Poland. The Tartars crossed the Danube, besieged Strigonium, then the chief city of Germany, and inflicted fearful cruelties on both sexes and all ages, but they did not permanently establish themselves.

All Europe was alarmed: nothing so terrible had happened since the invasion of the Arabs in the eighth century.

Meantime the Arabs, or Saracens, spreading east and west, conquered many countries. They ceased to be united under one ruler, and contended for supremacy as fiercely with their coreligionists as with those who were not followers of the Prophet. The Turks, a ruling tribe among the Tartars, were gradually increasing in predominancy. They professed various religions, including Christianity and even Judaism. Contending with the Mahommedans, they, for the sake of power, in many instances embraced Islamism; and, having men of energy as rulers, these became at length the chiefs of their religion as well as of their armies. Long dynasties of Saracenic and other descent had come and passed away during the eight centuries since the rise of the Prophet Mahommed. The chief seat of empire had been variously fixed at Damascus, Bagdad, and other ancient cities. From the rude sons of the desert the Saracens had grown into the most renowned in arts and sciences of their day. The period depicted in the "Arabian Nights' Entertainments," truthful as regards the manners of the period, represents a time when art and science had attained a high position.

In the west the Popes of Rome had long fiercely contended with the Greek Patriarchs for supreme power in the Christian Church; in A.D. 1052 the separation between the Churches became final. In the eleventh century the increasing power of the Turks and their possession of Palestine excited to a furious zeal the nations of the West, and gave rise to the remarkable series of wars known as the Crusades. But the temporary successes of Christian princes only checked for a time the encroaching power of the Turks, and the fiery zeal for the holy places having died away in the West, Mussulman power steadily advanced towards the conquest of the waning Greek empire. Of the nations of Europe, Hungary and Poland were most energetic in their opposition to the encroachments of the Turks.

Othman, or Ottoman, son of a Turkish chieftain on the banks of the Oxus, by energy and conquest managed to get himself appointed from the position of vassal to the caliph succession, and fixed upon Byrsa, in Bithynia, as his capital. His successors, however, became more famous than himself. His grandson, Amurath I., after much depredation in Asia, made war upon the Sclavonians of Europe. He conquered Bulgaria, Servia, and other tribes between the Danube and Adriatic. These nations had become partly Christianised, and of the best of the young men, or rather children, whom Amurath took captive, he formed that body of soldiers long known as the Janizaries; this was about the middle of the fourteenth century. Adrianople became the Turkish European capital, and a firm footing was established. The Greek emperor, John Palæologous, and his sons, became the vassals of the proud Sultan, and it seemed as if little comparatively remained to cause the declining Empire to pass away.

The Turkish caliph, or sultan, was the supreme head of the spiritual as well as the temporal power of his people, and this double authority added much weight to the force of his absolutism.

In the fifteenth century a league was formed to oppose the advance of the Turks. Ladislaus reigned over Hungary and Poland, and he united with Frederick III., emperor of Germany, the Pope, and the Greek emperor, Constantine, the latter undertaking to guard the Bosphorus.

So great was the jealousy of contending parties among the Mussulmans, that rival caliphs for the time favoured, or seemed to favour, the views of the Christian powers, that they might weaken their adversaries. At this time the sultan of Caramania intimated to the league that if a vigorous attack was made in Anatolia by him, and the fleets of the West at the same time occupied the Hellespont, the Ottoman or Turkish Empire would go to pieces. The Polish and Hungarian Diets raised the cry of a war for Christianity, and Ladislaus, crossing the Danube, led the confederate armies to Sophia, the capital of Bulgaria. They were victorious, and the Turks yielding, a treaty was made to evacuate the Hungarian frontier and restore Servia to the Christians. The Turks swore on the Koran, the Christians on the Gospel. The Turks desired the Christians to swear by the Eucharist, but this they would not do.

Ladislaus was so bitterly reproached for the treaty he had made with the Turks, that he sought and obtained absolution from the Pope that he might break his solemn oath. Thus was the treaty broken almost as soon as made. The Catholics marched through Bulgaria, carrying fire and sword, and wantonly destroying the churches and Christian villages. Amurath, the sultan of Caramania, now entered Europe to assist in the defence of the Ottoman Empire. The Greek emperor either could not or would not prevent this. He has even been accused of yielding to bribery, and the admiral of the fleet, who was the Pope's nephew, culpably neglected the duty of defending the Straits which had been intrusted to him. Amurath advanced from Adrianople with an army of sixty thousand, and a copy of the broken treaty was displayed in front of the army.

A fierce battle was fought at Varna, ten thousand Christians were slain, and among them Ladislaus, king of Poland, A.D. 1444.

Mahommed II., surnamed the Great, a son of Amurath, was a devout Mussulman, so strict that after conversing with an unbeliever he washed his hands. But as he advanced in years his pride increased to such an extent that he considered himself as great a man as the Prophet himself, and at times even threw doubts on the Divine mission of the founder of his faith. He was learned; he spoke five languages, and was well informed in history and the geography of the world as then understood. He was grossly licentious and cruel, and when he ascended the throne, at the age of 21, he killed his younger brothers as objects of his jealousy. Like most ambitious tyrants, he affected to desire peace, and made a treaty to this effect with the Greek emperor. He now prepared with diligence for that which he had long intended to do, and which for centuries the sultans had been looking forward to as the destiny of the followers of the Prophet. He gave orders to build a fortress on the Bosphorus. In 1452, on March 26, an active crowd of Turkish artificers arrived at Asomatou. A thousand masons, each with two assistants, commenced their work; two cubits was marked for the daily toil of each. The fortress was built in a triangular form, the walls were twenty-two feet thick, and the towers thirty feet thick. The whole building was covered with a platform of lead. Mahommed with eagle eye watched the work himself: all worked with the fear that those know who are under a tyrant whose frown may be the quick forerunner of death, and

whose smile may perchance portend a happy fortune.

The Greek emperor beheld with terror a work which needed no words to explain its meaning. He tried to bribe and flatter an enemy who now only waited till his work was ready, to open some occasion of quarrel.

The ruins of churches, marble columns, and figures of saints and angels, were seized to help to build the walls; and if any Christian dared to remonstrate or oppose their removal he had to pay the penalty with life or property, or perhaps both.

Constantine asked for a Turkish guard to protect the fields and fruits of his subjects. In mockery the request was granted, and the mules and horses of the guards fed upon their cornfields. This was more than could be borne; a fight ensued, and many on each side were slain. Upon hearing this, Mahommed ordered the nearest village to be razed to the ground.

Until this time the gates of Constantinople had not been closed against those Turks who wished to visit it for commerce or pleasure; but now they were shut against the foreigner, to be opened no more until force battered down the walls. "Since," said Constantine to Mahommed, "neither oath nor treaty can secure peace, pursue your impious war; my trust is in God. If He delivers the city into your hands I submit; till then it is my duty to live and die in defence of my people." The Sultan replied menacingly. His fortifications were complete, and before he departed for Adrianople he left orders that no vessel should pass without paying a tribute. An immense cannon guarded the Strait. This cannon had been made by a Hungarian, who, disgusted with the ill-treatment he supposed himself to have received in the employ of the Greeks, deserted to the Mahommedans, and appearing before the Sultan he was asked if he could cast a cannon which could throw a ball or stone with sufficient force to knock down the wall of Constantinople. He replied that he knew well the thickness of the wall of the city, but were it thicker and stronger than the wall of ancient Babylon he could construct an engine which would be strong enough to demolish it. "But," said he, "your engineers must place it in the fitting position." Commissioned to prepare the cannon, the Hungarian had a foundry constructed at Adrianople, and in three months Urban produced a brass cannon. The bore measured twelve palms; the stone bullet prepared for it weighed 600 lbs. A vacant place was chosen to try this immense ordnance. The explosion was felt and heard for 100 furlongs round, and the ball was driven for more than a mile until it was buried a fathom deep in the earth. Two months were spent in conveying the cannon to the walls of Constantinople. It was drawn on waggons by sixty oxen, with two hundred men on each side to poise the rolling weight, and two hundred and fifty men marched before to repair bridges and smooth the way.

The siege of Constantinople was deferred till the spring, but an Ottoman army marched into the Morea to divert the forces under the brothers of the Emperor.

The Greeks and Turks each had passed an anxious and almost sleepless winter—the former kept awake by their fears, the latter by their hopes of plunder.

Mahommed amused his leisure by building at Adrianople the lofty palace of Jehan Numa, "the watch-tower of the world."

Once, at dead of night, he started from his sleep, and called for his prime vizier, Calil Basha. Now this vizier, when Amurath, father of Mahommed, had been deposed from his throne, sought his master's restoration, thus interfering with the ambitious and unfilial views of Mahommed II. Besides, he was avaricious,

and had taken bribes from the Christians; his guilt in this respect did not yet meet its reward. He feared, however, when thus summoned in the night, for his conscience was guilty. He embraced his wife and children, fearing it might be for the last time, and filling a cup with pieces of gold, he hastened to his master, whom he addressed according to Oriental custom, and presented with the cup of gold.

"It is not my wish," said the Sultan to him, "to resume my gifts, but to multiply them. I ask from you Constantinople."

Recovered from his surprise, the vizier replied, "The same God who made you sultan will not deny you this. We will sacrifice life and fortune to attain it."

"Lala [or preceptor]," said the Sultan, "do you see this pillow? All night long I have pulled it from one side to the other; sleep has not visited these weary eyes. Beware of the gold of the Greeks. In arms we are superior to them; with the aid of God, and the prayers of the Prophet, we shall master Constantinople!"

To sound the disposition of his soldiers, the Sultan wandered sometimes alone through the streets, but it was death to whoever should discover him.

He now spent hours in delineating a plan of the city, and debating with his generals where his artillery was to be placed.

The troops of Asia and Europe extended on the right and left from the Propontis to the harbour. The Janizaries were placed in front of the Sultan's tent. The Ottoman line was covered by a deep entrenchment, and a subordinate army enclosed the suburb of Galatea, and watched the Genoese, whom the Turks had bribed to favour them.

The Greek emperor implored help from Christian Europe. Pope Nicolas V. had prophesied the fall of the empire, but to conciliate him Constantine deceitfully offered spiritual obedience to the Pope, who was not deceived, but yielded an assent to the offered union of the Churches. On December 12th the representatives of the nation joined in communion; but the members of the Greek Church abhorred the language, dress, and ritual of the Romish Church. When pressed by the more honest among them for their deceit, the reply was, "Wait till God delivers us from the great dragon; you will then see if we are reconciled with the followers of the Pope." From the dome of St. Sophia men and women rushed to the cell of the monk Gennadius, to consult that oracle of the Church. The holy man was entranced in meditation. "Why," said he, "will ye, instead of trusting in God, put your trust in the Italians? In losing faith ye will lose your city. Repent! consider that from the moment ye renounce your religion by embracing impiety ye submit to foreign servitude."

According to his advice, the religious virgins, "pure as snow, and proud as demons," rejected communion with the Latin Church. From the monastery the Greeks repaired to the tavern, drank confusion to the slaves of the Pope, and emptied their glasses in honour of the Virgin. The chief priest of St. Sophia said he would rather see the turban of the Prophet in the city than the tiara of the Pope. Constantine thus lost the sympathy of his subjects. The Sultan flattered many of the rich with the hope that their wealth would survive the approaching ruin of their government. They thus withheld that material aid which would have assisted their sovereign and his faithful followers in their efforts to save their country. The mass of the people were little disposed to fight, and few offered themselves or their fortunes in the emergency.

In the spring of 1453 the troops of the Sultan ravaged the surrounding towns and villages, and whoever resisted was destroyed. On the 6th

of April the standard of the Prophet was planted before Constantinople.

The number of the investing army is stated by Gibbon as probably reaching to above a quarter of a million. The vessels of the Sultan were numerous; 320 craft of various sizes floated on the Propontis, but most of the vessels were store ships, 18 only were galleys of war. The population of Constantinople at this period was calculated to be not more than *one hundred thousand*—a contrast, indeed, with the millions of old Rome, though it is likely that they were much over-estimated.

By command of Constantine, volunteers for the defence of the city were sought for through the town.

The prime minister, the famous Phranza, to his grief and shame could find less than five thousand who were willing to fight to the last for their homes and their country. This painful news remained secret between the Emperor and his faithful servant. Two thousand Genoese, commanded by John Justinian, came to assist. A strong chain was drawn across the harbour supported by some Greek and Italian vessels of war and merchandise. The ships of every nation which happened to arrive were detained for the public service. Thus, against the power of the Ottoman Empire, a city of about 16 miles in extent was defended by about seven or eight thousand soldiers.

The besieged could not hope to obtain help from without.

Of the triangle which composes the figure of Constantinople, the two sides along the sea were made inaccessible to the enemy, "the Propontis by nature, and the harbour by art. Between the two waters the basis of the triangle, the land side, was protected by a double wall and a deep ditch, of the depth of 100 feet." Phranza says this was six miles long. The Ottomans directed their principal attack against it. At first the Greek soldiers went into the ditch or sallied into the field, but one Christian was of more value than 20 Turks, who were so much more numerous. Afterwards the Greeks remained on the defensive. The nation was pusillanimous, but the last Constantine was heroic, his noble band of volunteers was inspired with Roman virtue, and the foreign auxiliaries supported the honour of the Western chivalry.

The incessant volleys of lances and arrows were accompanied with the smoke, the sound, and the fire of their musketry and cannon. Their small arms discharged at the same time five or even ten balls of lead, the size of a walnut.

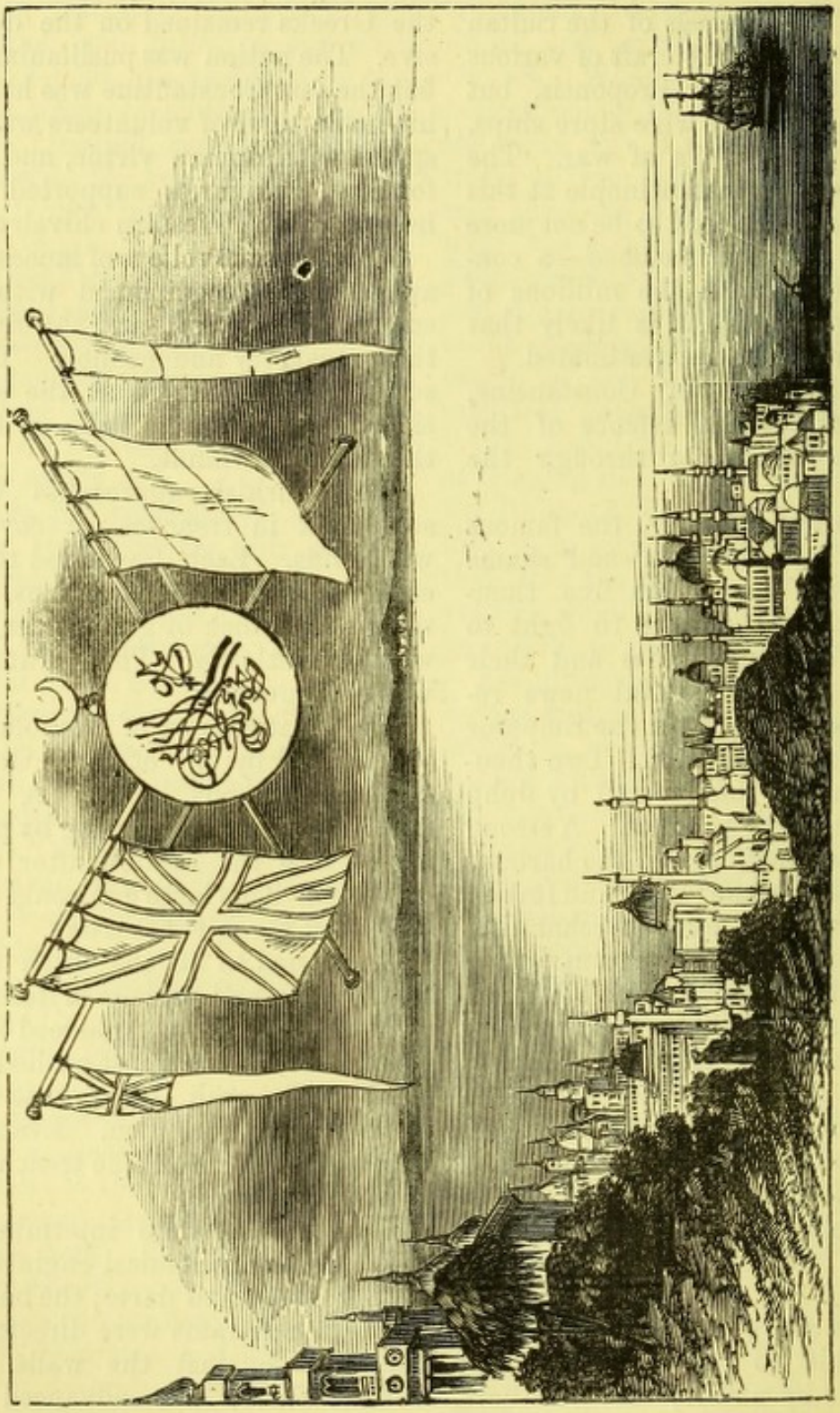
The Turkish approaches were soon sunk in trenches or covered with ruins. Each day added to the experience of the Christians, but their small stock of gunpowder was wasted fruitlessly. Their ordnance was not powerful.

The great cannon of Mahommed was flanked by two others. One of the large cannons burst. A man tried to prevent it bursting by pouring oil into the cannon after each explosion. This large gun could only be loaded seven times a day.

They tried to fill the ditch with trees, casks, and various material.

At first the shots produced little effect, but the foremost pushed forward with such force that the weakest were hurled on. Even the imperfect filling up of the trench was at length effective.

The cannon were intermingled with various mechanical engines for casting stones and darts; the bullets and battering rams were directed in proximity against the walls. A wooden turret was advanced on rollers. The turret was covered with bulls' hides, and incessant volleys of shot were discharged through the loopholes in front. At the back three doors had been made for the alternate sally and retreat of



STAMBOUL,

the soldiers. On the top platform of the turret a scaling ladder was placed against the tower of St. Romanus. After much difficulty the tower was overthrown, but the Turks were driven back and the darkness of night came on.

Meantime the night was spent by the Emperor and Justinian in desperate efforts to defeat the purposes of the Mussulmans by destroying their works; and, when the morning came, the turret was found reduced to ashes, the tower of St. Romanus had been hastily restored, and was as strong as before the ditch was cleared of the materials which had been employed by the Turks to fill it up. Mahommed declared that the word of thirty-seven thousand Prophets would not have made him believe such a work was possible by the Infidels.

The cold, tardy help of Christian princes at length began to arrive. Five large vessels came laden with provisions and ammunitions of war from the Archipelago. Contrary winds had retarded their progress, but at last a favourable breeze brought them through the Hellespont and Propontis. One vessel bore the Imperial flag, the others were Genoese, laden with wheat, barley, oil, and wine, and containing troops. How was this flotilla to approach the city invested by the vast number of vessels which floated on the waters, and which seemed to laugh to scorn the feeble attempts to help the devoted city? A vast concourse of people stood on the shores of Europe and Asia, gazing on the spectacle of the five Christian vessels, which at first sight seemed hopelessly about to wade through the three hundred vessels which, scattered on the waters, seemed to defy all approach of intruding ships. But the numbers did not really indicate strength; many of them were little more than boats, ill-commanded, and unable to withstand the shock of contact with a vessel of war. The eighteen war galleys of the Sultan did not even contain any cannon.

In contrast, the Christian ships were stout vessels, the first-class vessels of their day, and manned by Genoese sailors; commanded by veterans who were skilled in their profession. Their artillery, well directed, swept the sea of most of the small craft which crowded around them in hopes of arresting their progress. The Sultan sat on horseback on the shore watching the conflict, threatening those who failed, and promising magnificent rewards to those who were successful, and, as if he had been commander of the waves, from time to time dashed his horse boldly into the sea.

Twice repulsed, the Ottomans made a third and fatal attempt to stop the progress of the Christian ships. Twelve thousand Mussulmans were slain, and the remainder fled from their ships to the shores, while the Christian squadron triumphantly steered through the Bosphorus and anchored within a chain of the harbour. The Sultan in bitterness exclaimed that if Allah had given him the earth he had left the sea to the infidels.

The commander of the Turkish fleet had received a wound in the eye, which he assigned as the cause of his defeat. In presence of the Sultan he was extended on the ground by four slaves and received one hundred strokes with a golden rod. He survived, and adored the clemency of his master in sparing his life. Such was the mercy of Mahommed II.

The reduction of the city seemed almost hopeless, as it was strongly defended, and the harbour was now protected by eight large ships and twenty smaller vessels. It was almost hoped that the Sultan was about to retire from the attack, instead of which he formed the bold

project of transporting some of his lighter vessels over the land, and getting them into the shallow part of the harbour between the large vessels and the city. Ten miles of uneven ground had to be traversed. A road was opened behind the suburb of Galatea. A roadway was formed of strong wooden planks, and to make them smooth, these were smeared with the fat of sheep and oxen. Four-score light galleys and brigantines of from thirty to fifty oars were disembarked on the Bosphorus shores, placed on the wooden road, and, in a night, dragged over the ten miles and floated in the harbour far beyond the reach of the large ships, which now vainly guarded the entrance of the harbour. The real advantage of the situation was magnified by the fears of the Christians.

This curious feat has been recorded by the historians of both sides. A similar occurrence is said to have taken place anciently, and in the American war the British, in like manner, transported their vessels from one lake to another.

Mahommed now constructed a bridge of casks joined together and covered with planks. On this floating battery he placed a large cannon, and his eighty galleys with troops and ladders approached the most accessible side of the city, the spot which had formerly been stormed by the Latins.

A spirit of discord prevailed among the Greeks; an unorganized effort was made to burn the Turkish galliots, which now touched their shore. Forty of the noblest of their youths engaged in this attempt were murdered by the Sultan, and in retaliation Constantine hung up more than two hundred of the Turkish captives in his hands on the wall of the city.

The fortifications of ages were now destroyed by the Ottoman guns, and many breaches made in the walls.

To pay his troops, Constantine dismantled the churches of their gold and silver, with vain promise of a fourfold restoration. During the siege words of peace had been sometimes spoken, and embassies had passed between the combatants. Constantine would have sacrificed everything except his honour and his religion, but the offers of Mahommed had no foundation in truth, and their hollowness was apparent. He prepared for the final assault. The 27th of May had been fixed for it, but the warning of an astrologer delayed it till the 29th. The orders were given on the evening of the 27th, and a herald was sent to proclaim through the camp, "If ye have the wings of a bird ye shall not escape if ye are disobedient to my call, said the Sultan."

Most of his Janizaries and Bashaws were of Christian descent. From time to time these were replenished with the superior captives which fell into his hands.

In this holy warfare the Moslems were expected to purify themselves by prayer and even ablutions, and to abstain from food till the close of the ensuing day. A crowd of dervishes visited the tents to instil a desire for martyrdom into the minds of the soldiers. They were assured of immortal youth to be spent in the embraces of black-eyed virgins amid the rivers and gardens of Paradise. But Mahommed depended on the incitement of more material rewards. He said, "The city and the buildings are mine, but to you I resign the captives, the gold, the treasures; be rich and be happy. He who first scales the walls of the city shall be governor over the fairest of my provinces. My gratitude shall heap more honours on his head than he can hope for." Such motives diffused general ardour. The camp re-echoed with "God is God; there is but one God, and Mahommed is the Apostle of God." Far different were the unhappy Christians. With loud and

impotent cries they deplored their sins and their condition. The image of the Virgin had been carried in procession, but she was deaf. The people accused the Emperor of refusing an early surrender. They anticipated their fate, and even longed for the repose of Turkish slavery.

The noblest of the Greeks and bravest of the allies were summoned to prepare themselves for the expected assault of the morrow. The last speech of Paleolagus was the funeral oration of the Roman empire. He vainly tried to instil into his generals a hope which had left himself. Neither the Gospel nor the Church has promised special rewards to such as fall in battle. The courage of despair alone armed them. They embraced each other for the last time; regardless of family and fortune, they resolved to sacrifice their lives. The Emperor and his faithful companions received the Communion for the last time in the cathedral of St. Sophia, which in *a few hours* was destined to become a mosque.

After reposing for a very short time in his palace, he mounted his horse to view the motions of the enemy. There was something grand in the last hours and fall of the last emperor of the Greek empire. He at least fell bravely, fighting for his people, and did not think to save an ignoble life by personal humiliation to his foe. The Turks had been all night preparing for the attack. Their eighty boats were close under the walls, the scaling ladders were ready, part of the ditch was made a level. Silence was imposed, and at daybreak the assault began by sea and land. A miscellaneous crowd of old men, peasants, and very young persons, excited by the harangues of the dervishes and the hope of the plunder, came forward, and were pushed on, that some of the ammunition of the Christians, which was known to be scanty, might be spent on them. Short work was made with these miserable persons; they were soon in the ditch: thus they were of more use by filling it up in death than in life. The troops of Anatolia and Roumania were led to the attack. For two hours the Greeks maintained their position, the Emperor calling to them to defend their country. Now the Janizaries arose fresh to the conflict. The Sultan on horseback, with an iron mace in hand, was watching them with eager eyes. He was surrounded by 10,000 of his domestic troops—reserved for the decisive moment. He directed the battle. His many ministers of justice were stationed at the back of the assaulting force, to urge them on and destroy any who refused to obey or tried to escape. The cries of fear or pain were drowned in the music of drums and trumpets. Experience has proved that loud sounds, by quickening the blood, inspirit the man, and excite him to deeds of desperation in battle, more than reason or honour can persuade. The Ottomans now thundered on all sides; the camp, the city, the Greeks, and Turks were in a cloud of smoke, destined to disappear when the empire had irretrievably fallen. A turning-point at the moment was when a bullet struck Justinian, the Genoese commander. He was not mortally wounded, but the sight of his blood and the anguish he suffered overcame him. He was the chief support of the Emperor, who implored him if possible not to quit his post. "Whither will you retire?" said Constantine to him, when he saw him turning away. "I will go the way which God has opened to the Turks," replied he, and passed through one of the breaches made in the wall. He was followed by the greater number of the Latin auxiliaries.

The double walls of the city became a heap of ruins.

The Turks were, perhaps, a hun-

dredfold more numerous than the soldiers who fought against them. There could be no hope for the city; its hour was come.

The man who deserved the Sultan's reward received it. He was Hassan, the Janizary. Gigantic in size and strength, with his scimitar and buckler he ascended the fortifications, and thirty men followed him; eighteen perished. Hassan and twelve of them reached the summit; he fell, but rose again, and was again nearly overcome, but he persevered and succeeded. The walls were soon covered with the Turks, and the Greeks were overwhelmed by numbers. The Emperor was long seen fighting bravely, and his sad cry was heard, "Is there no Christian to cut off my head?" He dreaded most of all to fall into Turkish hands. He cast away his purple robe, and soon disappeared among the crowd. At last he fell by an unknown hand, and no more hope or order was left among the Christians. The Turks rushed through the walls. In the first heat of victory about 2,000 Christians were slain. This was excused by the statement that the Emperor, having made so obstinate a resistance, such might be expected from his subjects.

Thus Constantinople fell after a siege of fifty-three days. The size of the city for some little time prevented the entrance of the Turks from being known everywhere; but as soon as it was, the people rushed to the cathedral to obtain shelter and protection. In an hour it was filled with both sexes and all ages. Great confidence was placed in an old prophecy that the Turks should take the city indeed, but that when they came to the front of St. Sophia, an angel would descend from heaven and deliver the empire out of their hands. While they expected the angel the Turks came and broke open the doors of the church. No resistance was offered, and the Turks chose whom they would as captives. No right but might governed them; and youth, beauty, and the appearance of wealth guided their choice. In an hour the males were bound with cords, and the females with their veils and girdles. All ranks intermingled: the senator with his slave, the prelate with the porter of the church, the most noble with the meanest. The captors were careless of the groans and cries of mothers and children. The nuns were the loudest in lamentations; they were torn from the altar with naked bosoms and dishevelled hair; with blows and threats they were driven in strings through the streets. About 60,000 were, from various parts of the city, taken to the camp and fleet, and exchanged or sold, as caprice indicated, to be scattered through the Ottoman empire.

Phranza, Constantine's faithful minister, became the historian of the siege. He too was made a captive, but he contrived to escape, after four months' captivity, and he was able to ransom his wife from the Sultan's mirbaski, or master of the horse. His son and daughter had been taken by Mohammed himself. The son was murdered by the tyrant, and the daughter died in the harem.

Although the horrors of this siege and capture were great, yet, on the whole, the Turks have not been accused of a wanton waste of life on a large scale. In general, life was spared for ransom or slavery. In the spoils every man took what he could get. The amount has been estimated at four million ducats (see Gibbon's "Decline and Fall"). Of this a small part belonged to the Genoese, Venetians, Florentines, and merchants of Ancona.

Much of the wealth of the Greeks was expended in fine apparel, in handsome palaces, or buried in ingots of gold and silver, and coins hidden away, lest they should be demanded for the defence of the country.

The profanation of the churches and monasteries excited the greatest horror. The dome of St. Sophia,

with all its beauty, made to imitate the firmament, was despoiled; and the golden vases, ornamented with jewels, the offerings of kings and princes for many ages, were taken for common use; the images were broken, and the wood cast into the fire.

In eight hours from the attack the Sultan passed through the gate of St. Romanus attended by "Vizir Bashaw guards, each as robust as Hercules," said to be equal in battle to ten common men.

TURKEYANA.

A NATURALIST'S RAMBLES IN DEVON AND CORNWALL.

THE visit of the British Association bringing me to the south-western counties, I was induced to make a few notes of what I saw. The county of Devon is peopled by clearly-defined Gaelic, Celtic, and Scandinavian types, and affords therefore among its present inhabitants one of the best places for the study of anthropology.

The Gaelic type is shown by the predominance of dark hair, and eyes either black, dark grey, or brown; a figure muscular, and moderate in size, and with powerful passions, prone to be displayed in love, jealousy, revenge, or in some other striking manner.

A considerable number of the people of Plymouth are of the Gaelic type, which is a pleasing contrast in many respects to the more Saxon populations of Sussex, Wiltshire, and Hampshire. The Celtic type—common likewise about Plymouth—is of a more delicate form than the Gaelic, fairer in skin and lighter in hair, more susceptible in the nervous system, and less violent in passions. Both the Gaelic and Celtic types display a hospitality and a liberality to those they take a fancy to which is more rarely seen amongst people of Saxon origin. The civilisation of Devonshire, as manifested at its most intellectual centre, Plymouth, is greatly to be attributed to the infusion of Scandinavian blood. The Scandinavians, attracted by the unrivalled advantages of the spot as a seaport, have made it a great focus of nautical enterprise, and intermarrying with the Gaelic and Celtic women have produced sons who united those great extremes of qualities which in exploration, science, and art have rendered the inhabitants of Devonshire so illustrious. Sir Walter Raleigh and Sir Joshua Reynolds were men renowned for the strength and activity of their intellectual powers, and for their force of character, which enabled them to execute what they had planned. Plymouth is but separated by a river from Cornwall, so the people of South Devon and Cornwall are closely allied; but the Celtic appears to be greatly replaced by a type of man whom some ethnologists term Iberian. Certainly a Spanish cast of countenance is more common in Cornwall than in any part of England, and the people of this type, even of the humblest positions, show a suavity of manner, an intelligence, and a liveliness of intellect combined, which is not to be found in so great a degree in any other part of our country. There is, perhaps, not quite enough of the enterprising element, unless when the Scandinavian type is plainly seen, as in the case of Sir Humphry Davey and Mr. Pengelly, natives of the neighbourhood of Penzance.

The Basque type, an obstinate, unimprovable, selfish, ill-formed, and

ill-mannered type, is likewise found in Devonshire, but not in such abundance as to preponderate, at least in South Devon. About Exeter and the villages of north and central Devon it is very abundant. Cautiousness of character is very conspicuous in this type; hence they are prone to economy, inclined to be dirty, and to have little value for educational excellence or polish of manner. These are "the Devonshire dumplings," who have become proverbial for unimprovable stupidity. Even the gentry when of this type compare unfavourably with the labouring class of the Iberian type in Cornwall. The beauty of the women of South Devonshire and Cornwall is very conspicuous, delicacy of features and an air of refinement being frequently seen amongst the poorest, which is accompanied by a delicacy of constitution which inclines to consumption, and incapacitates for the hard work which the more vigorous Scandinavian and Basque types are capable of. I am inclined to think that this beauty is mainly Celtic.

Of all towns Plymouth appears to possess, for its size, the greatest number of beautiful women.

Devonshire and Cornwall are full of striking geologic contortions of strata, and abound in earth treasures, organic and inorganic. Under the guidance of Mr. Whitaker, of the Geological Survey, our party of about ten took the train for Tavistock. The day did not promise fair when we started, but when we reached Tavistock heavy rain fell. We took the good road towards Brent Tor, a granitic hill 1,200 feet high. Along the road some specimens of a vesicular rock were collected which were declared to be not volcanic, although much resembling vesicular trap in structure. On the left hand side the party examined the rubbish heaps of an unused mine. As we reached the gate leading to Brent Tor the rain and mist were so dense that the hill and church on it were barely visible; however, the party ascended, although wet through with their four-mile walk. We waited for about three-quarters of an hour on the summit of the hill, expecting it would clear; and it did, so that we obtained a view of the superb prospect, one of the highest points on Dartmoor. Taking refreshment at the Manor hotel at Lydford, we walked on to view the cascade, which falls from a height over the cliff variously estimated at from eighty to one hundred feet. The body of water is small, but the effect is very pretty, at the head of a valley clothed with beautiful wood on both sides, through which the stream fed by the waterfall flows. The banks of the valley abound in flowering plants, mosses and other cryptogams, most of which either grow in a luxuriance unusual in the east of England, or are of distinct species or varieties. Insects of local forms were noticeable. Some of our party walked on to a high portion of Dartmoor, the road to which lay through a lane where a row of trees were covered with moss and lichens of unusual beauty of colouring and markings, such as would present a most unrivalled study to the artist in foreground plants.

Among the excursions which the people of Plymouth, with unusual liberality, provided gratis for the members of the British Association was one to the Sound and offing, to enjoy a dredging. Accordingly, a Government steamer being provided, about fifty went on board. The day was somewhat showery, and the sea rather rough, rendering it unpleasant for the ladies of the party. The dredge was frequently put down, and brought up about fifteen species of polyzoa and hydrozoa, three species of anelides, three species of sea eggs, and five of star fish, including the brittle star. Amongst mollusca was the curious

Bulla aprita and a *nucula*, a *tapes*, and about twenty-five other species, some of them being in bad condition. Nothing rare or valuable was discovered, but a large number of creatures which were most interesting when seen alive in the bottles of sea-water with which some of the excursionists were provided. There were some curious crustaceans. The excursion occupied the greater part of the day, and was conducted by Mr. Gwyn Jeffries.

Plymouth presents to the lover of the picturesque a treat in the views from the Hoe and Mount Edgcumbe which are finer than those from any other port in the kingdom, with the exception of Falmouth; so we were easily induced to make two other marine excursions, one to the various points in the harbour, a second to Mount Edgcumbe, a peninsula of Cornwall overlooking Plymouth, which gives the title to an earl. His lordship throws the place open on one day of the week to the public, where beautiful walks in winding woods, and a herd of deer of the fallow species, give an almost unique beauty and interest to this peninsula, which has the blue sea rising frequently into sheets of foam on each side.

The other excursion we made was to the Wearhead, along the winding Tamar, a voyage of about half a day, the banks of which are clothed with wood. On one side is Devonshire, on the other Cornwall. Landing on the Cornish side we went into a cottage, where, with a party of some of the prettiest young ladies of Plymouth, we took tea. It was rare botanising to be able to gather such flowers. We had with us a general, the conqueror of many fights, and with these his "latest hours were crowned." We reached home when the sun had sunk and the grey shadows of the evening were creeping along.

The most charming excursion I ever went with the British Association was that to Liskeard on the Thursday following the conclusion of the Plymouth meeting. It was a day of brightness well calculated to throw over that meeting the parting halo of a setting sun. The train took us to Liskeard station, from whence carriages conveyed us to Moorswater, where trucks stood ready for us which usually contained minerals—geological specimens—but on this occasion were to convey geologists, or those who for the time were to do duty as such.

The trucks were open mineral waggons, but were fitted up with seats for us, which were covered with calico so that they might not soil our clothes. There was no passenger traffic on the single line of rails. As we rolled rapidly up the hilly country, the clear atmosphere showed the shining beauties of the place. We first stopped at St. Cleer, where we viewed the well of St. Cleer.

Miss Becker, who was of the party, gathered the alkanet, *Anchusa sempervirens*, a rare plant: except at Lewes, I had never found it.

We again got into our waggons, and they next stopped to let us out to view the Trethevey cromlech, a pile of large stones. The waggons then took us to the bottom of a hill. We left them and went through a pretty valley, and began to climb a hill, and reached the Phœnix mine, and walking to the front of the counting-house of the mine, Professor Warrington Smythe, who was of the party, proceeded to describe the character of the lodes of the mine which he had referred to in his lecture to the Association.

The Phœnix was formerly an exhausted copper mine, but Mr. West (one of the principal proprietors at the present moment, although formerly but a poor boy), conceiving that the mine might be very productive in tin if they only went deep

enough, induced capitalists to supply him with money, and the result was that the mine, for many years, paid a profit of £20,000 per annum, and that Mr. West's share was £12,000 per annum.

Even in the present very bad times, in consequence of the excessive competition of the rich ores of the world, this mine still continues to pay a handsome profit. Mr. West gave an interesting account of his early life and adventures—how he rose to be engineer of all the principal mines in the neighbourhood. On one occasion the Bishop of Exeter being anxious to go over the mines, he accompanied him, and on the bishop requiring information as to the action of steam power, he induced the bishop to get into a scale somewhat heavily weighted, which had the effect of throwing him rather higher in the scale than he had been before, an incident which excited much amusement.

Among the minerals found in the mine, and shown to the visitors after the conclusion of the speech of Mr. West, were fibrous malachite and native copper, both of the arborescent and the moss-like forms; quartz coloured by copper, iron, and manganese; quartz enclosing chlorite, blue and green carbonates of copper, carbonates of iron of various forms; phosphates of copper and iron, and red oxide of copper, copper pyrites, iron pyrites, hematite, iron glance, steatite, sub-oxide of copper, Cornwallite, Henwoodite, phosphocalcite, and above all cassiterite in compact masses, rarely showing distinct crystals, and then only of a small size. Iron and copper were associated with the cassiterite. The best ore comes from the deepest parts of the mine. A very choice ore was of a light slate-blue colour; it contained about thirty per cent. of pure tin, and being obtained in large quantities it was more to be relied on than the more crystallised varieties, which were so common in the earlier days of tin-mining. None of us being disposed to descend the mine, we contented ourselves with inspecting the operations on the surface. The first process we noticed was that of breaking the tin ore with hammers, an operation done by women, who in many cases were particularly well formed, some being even beautiful, both in features and figure. They contrast most favourably with factory women, both in Glasgow, Manchester, and London. They earn but 10d. a day, which is low in comparison with the wages females receive in Manchester and Glasgow. After the ores are broken and sorted, they are transferred to the stamp, an apparatus for pounding, worked either by water or steam-power, founded on the principle of the mortar and pestle. The powdered material passes through a grating, a stream of water is made to flow with the ore into the stamps or pounding apparatus, by which the ore is carried away in wooden troughs into the cistern. The water and ore flow through a succession of troughs and receptacles, some of which contain apparatus for constant agitation, by which the tin ore, from its great weight, is separated from the lighter impurities. With the less valuable ore, this operation is performed thirty-eight times, the stream of water being constantly maintained. At last the tin ore is considered to have reached its highest state of concentration, and is dried to be sold to the smelter. The various impurities contained in tin ores are extracted each by its own peculiar process; those ores containing arsenic being subjected to calcination or roasting, previous to washing in a reverberatory furnace; the stamping is gone through again on removal from the furnace.

We obtained specimens of the different qualities of tin ore both at the Phœnix and Dolcoath mines, the latter being perhaps the largest and best organised tin mine in

Cornwall. The process of preparing the ores in both seemed nearly identical. The method of extracting and washing the copper ores is similar to that in use for preparing the tin.

We noticed an interesting process in use at the Phœnix mine, by which old pieces of iron were placed in troughs, through which flowed the waste water containing copper, principally carbonate, in solution or suspension. In this way, with little expense, about forty tons of copper were annually precipitated, a process which is vulgarly known as the transmutation of metals, and which is merely the solution of the iron by the acids contained in the solution of the copper, and its consequent precipitation. I obtained specimens of the iron thus coated with copper, which may perhaps be a clue to the manner in which the native copper found in this mine was formed. We walked through the Cheesewring granite quarry, where the granite is of fine quality. It is split by means of wedges forced into holes drilled in the blocks, so that with comparatively little labour it is hewn into square masses. Climbing up a ladder, another gentleman and I scrambled up a series of natural steps, each about four feet high, which led us to the Cheesewring, which has been called the most grotesque pile of rocks in Cornwall. After viewing the magnificent prospect, we scrambled on over a rough moor, where mosses were very abundant, and passed the Hurllers, a Druidical circle, which in mediæval times was said to have been the remains of some men who for breaking the Sabbath were turned into stone. We went down the hill to the South Caradon counting-house, where we were entertained at lunch, the cost being defrayed by a subscription raised by the people of the district. Among speeches of a complimentary kind, Miss Becker especially dwelt on the admirable appearance of the women whom she had seen working about the mines, and said they were worthy mothers for the men of Cornwall; on which Mr. Dymond, the agent of the mine, asked her to accept some mineral specimens as a souvenir of her visit. These were principally fibrous malachite, cuprite, and native copper combined, and some were very beautiful. Among the heaps of ore, we collected some good specimens of copper ores. The following week some of our party visited Western Cornwall.

Having but a few days, we were not deterred by bad weather from making long excursions. St. Michael's Mount was the first place visited. It is a hill of singular beauty. We were shown over the castle, which commands fine views of Mount's Bay; and the following day we visited Mousehole, a village about four miles from Penzance, where lived Dolly Pentneath, the last person who spoke the Cornish language, who died in the last century. The bulk of the people of this town, and we conversed with many, spoke with a very broad accent, rather difficult to comprehend. The Mousehole Cavern, which is situated in front of the sea, is lined with ferns of many species. On the cliffs above it we noticed several species of diurnal moths rarely found in other localities, such as *Erastria venustula* and *Actonia luctuosa*. The next day we visited the Logan Rock and Land's End. The Lady Logan, a smaller rock, was first moved, and the greater Logan was reached by a rather difficult path. It is said to weigh ninety tons, and yet is so poised as to be movable by the human hand. It is situated on a rather precipitous cliff, from which Lieutenant Goldsmith, nephew of the poet, with the assistance of the men of his cutter, overthrew it. On the complaint of the lord of the manor, Goldsmith was ordered to

put it back, an operation which was very costly, and made him a poor man for the rest of his life. The Logan rock is apparently natural, being the result of denudation or weathering. The Land's End was pretty well seen, though the day was not favourable for very distant prospects. The scenery is wild, but not so much so as at the Lizard. We noticed the cormorants on the rocks from the farthest point we could get to.

The following day we visited the Lizard and Kynance Cove, justly celebrated as the finest collection of serpentine rocks in the kingdom.

There are several remarkable sea-caves here, and a chasm through which the sea rushes with a force like distant thunder, that has caused it to go by the name of the "Devil's bellows." On the cliffs on the Downs above the Lizard we gathered the following plants :—*Erica vagans*, Cornish heath, *Geranium pyrenaicum*, *Serratuta tinctoria var monticola*, samphire *Crithmum maritimum*, which I also noticed on the cliffs near Teignmouth, Devonshire; *Aster Tripolium*, a dodder *Cuscuta epithymum*, and dwarfs of *Erythræa centaurium*. The heath especially was very luxuriant, the common clouded yellow butterfly was very abundant, but the specimens were smaller than in more sheltered districts. The cattle were very fine. These high downs were once clothed with wood. The oats appeared to thrive pretty well, and some wheat on the more sheltered spots was also in good condition. The Dolcoath and New Cook's kitchen mines were visited the following day, the nearest railway station to them being Camborne, after which we took the train for Redruth, from whence I walked to Carnbreh, which the older antiquarians supposed to be the great seat of Druidical worship in the county. Although the rocks are very remarkable, yet they did not, in the cursory examination which I was able to give, appear to show evidence of Druidical origin.

Hayle, with its remarkable Towans or hills of blown sand, was visited. The *Bulimus acutis* we observed in countless numbers. The view of the coast from these sandhills is very fine, the beaches of the little bays visible, being singularly beautiful in colouring. The mud of the river, which is thirteen inches deep, contains a considerable percentage of tin, which has accumulated from the various washings of the mines for ages, and is very remunerative to extract when prices are high, as they were some years ago. But now it barely pays for the expense. Among the plants noticeable was the sea spurge; the sea plantain, *Plantago maritima*; the fennel, *Fœniculum vulgare*, truly wild; the eringo; the musky stork's bill, *Erodium moscatum*; the sea stork's bill, *Erodium maritimum*; the sandwort, *Arenaria*; *Salvia verbenaca*; and the small centaury, *Erythræa pulchella*.

We crossed to Lenant by ferry, and took the train for St. Ives, an interesting old fishing town. Its streets are very narrow and dirty, but the views from the batteries are fine. It has very fine beaches, but the higher parts are much exposed to winds.

We visited Truro the next day, and went down the river by steamer, the most beautiful aquatic excursion possible in the West, the banks being clothed with wood to the water's edge. In this it resembles the Tamar, but the woods are more extensive. We reached Falmouth, and visited Pendennis Castle, which affords a very fine view of the harbour. This may be contrasted with that from Mount Edgcumbe, near Plymouth. Near the railway station I gathered a specimen of the rare hybrid mullein, *Verbascum thapso-lychnites*, a plant unknown in the locality. When at Penzance

we visited Mr. Charles Ross's collection of minerals, which was formerly Mr. Carne's. It is freely shown to the public, and is a very choice and valuable one; and when at Truro we saw the museum of the Cornwall Institute, which is rich in minerals. The cathedral at Truro is about the poorest in the kingdom, although once highly respectable as a parish church. It is crumbling to ruins on the outside, and is deformed by a large chimney, apparently for carrying away the smoke for heating the edifice.

Before leaving Penzance we visited Messrs. Bolthero's tin-smelting works, where the tin ore we had seen prepared at the Phœnix and Dolcoath mines was turned into the metal. The ore, in its state of fine powder, was mixed with anthracite as a flux, and subjected to great heat in the furnace, when the metal flowed off. In order to purify it, it was made to boil by the insertion into the molten metal of apple branches, which, being full of sap, caused such an escape of steam as to make the tin boil—a very curious and beautiful stage of the process. We saw the preparation of three kinds of tin, the "first" and "second," and the "grain tin," the kind which, from its purity, is alone suited for manufacturing the salts of tin; while the first kind, from its hardness, is more suited for the manufacture of bronze. The stalactites of tin found in the smelting furnaces are very beautiful, as are the crystals formed by slow cooling.

THE ISRAELITISH ORIGIN OF THE SCOTCH.

THE Israelitish origin of the Scotch is given in the "Ancient History of Caledonia," which purports to be "written by St. Chaldean and other saints of the Chaldean faith, and chiefly by the Johnstones, who held the royal pen for many hundred years." It is translated from the Latin by the Rev. Duncan McGregor, Catholic priest, Lochaber. This is a remarkable production, which has every appearance of being a genuine history. Want of space will not allow us to give a critique on it, but we give abstracts. Before "the Exodus" a portion of oppressed Israel escaped into the desert, but were pursued by Pharaoh. Israel cried to the God of Bethel, who "raised a storm of wind and sand mountains high, so that the Egyptians could not find them." Israel wandered through the desert of Assyria, living upon fruit. The King of Greece (probably Cecrops), at that time at war with Egypt and Assyria, perceiving that the Hebrews were skilful mechanics in brass, copper, dyeing, and weaving, protected them; and under his auspices they built the city of Troy. "The materials of which this city was built were bricks made of clay. This clay was dug to make a canal round the whole city, with drawbridges to draw up at any time for securing them from their enemies. This work went on so rapidly that they soon found themselves in a fortified position; and as the population increased, so did the city enlarge, the building going on with much vigour; and at the same time the other tradesmen were employed at their own trades, supplying the other nations around them with purple, scarlet, and fine linen, and war instruments of brass, copper, and iron."

The King of Greece was friendl-

to the Hebrews, and almost persuaded to worship their God, but his people would not allow him to turn from worshipping the horse, which was then their god. It was the habit of the Hebrews to go on pilgrimage once a year to the tops of the mountains to worship. This continued for several centuries, till a war broke out between Greece and Assyria. The Hebrews then refused to allow their young men to fight for the Grecians, and would not permit their daughters to marry Greeks, unless they consented to the rite of circumcision, and would offer sacrifices for seven years to the God of Bethel. A prince of the Trojans (Hebrews) had a beautiful daughter who was sought in marriage by a Greek prince, but was refused by "the laws of the altar." He besieged the city, and nearly starved the Hebrews, but they "cried to the Lord, and He sent shoals of fish of all kinds." The sturgeon, being the best fish, was offered as a thanksgiving on the altar, also "doves, which were numerous round the city." They then lived in comfort for some time, when a new generation arose who refused to offer sacrifice of the best of the fish, and refused to provide for the poor. These also refused to keep the Sabbath and seventh year as jubilee. They also refused to provide for their priests. Lazarus, a priest of Levi, was commanded by God to offer a sturgeon, a pair of doves, and young pigeons, and to say to the people, "Twice seven years have I provided for your table, and ye have rebelled against me, saith the Lord, and if ye do not repent I will give you up to destruction." They did not attend to the warning. Hard times of famine came, and their hearts were harder. The message came, "Arise and depart out of the city at the twelfth glass at midnight, when the watches are shifted on the towers, and come to the twelfth gate, which lieth towards the sea." Only about one hundred were obedient, among them the ancient ruler Daniel, and Lazarus the Levite. The boats were arranged on the sea side, and the scanty provisions the city afforded taken on board; also Jacob's pillow and the marble chair, the seat of their prince. The Gentiles prepared a wooden horse, and put two men inside it. They also took a man and cut off his nose and covered him with wounds. They then fled, and the Trojans gave themselves up to debauchery. Then the Gentiles came back and destroyed the city, but were in turn destroyed by some "*devil's fire*," as the Grecians called it, which had been hid in the synagogue to be used for "the defence of the city." While the Gentiles were offering the wooden horse on the "altar of the God of Bethel," the fire exploded and destroyed all that were in the synagogue worshipping the horse. "The ancient Trojans" were then scattered through the Greek empire, and the remnant of the Greeks occupied Troy. But the city was afterwards destroyed by storms of sand and an earthquake. "The spot where the city stood is now called the bay of Pechoi."

Those Hebrews who were in the boats were driven by winds to Carthage, which was governed by a queen, their goddess. When the Hebrews landed, they were ordered to go and collect twelve stones, which were neither to be hewn nor cut, to build an altar to the God of Bethel. Lazarus offered early the next morning a lamb for a peace-offering, and a kid for a sin-offering, and a pair of doves for a thank-offering.

The Hebrews found favour in the eyes of the queen, and she allotted them a piece of ground on which they planted vines. Here they kept the laws of the altar strictly, and every seventh year for many years. Each man got land according to the size of his family, and all were ruled by prince Daniel. Lazarus was

old, and after giving strict injunctions to Daniel and the elders, he died at the age of 120 years. He told them that they would be removed in the third generation to another land, and they would know if it were the land God had prepared for them, for the blood of their chief should stain the ground before their feet touched it. He said but few of them would remain faithful, and they would have great tribulations. The old saint died, and they mourned three times seven days for him. When the days of mourning were ended, his son, also called Lazarus, washed himself and anointed his head with oil, and went to the altar and offered a lamb for his original sin; and exhorted the people. The custom was for the betrothed women to wear a blue veil, and three-cornered napkin with white border. The married women wore the blue veil and four-cornered napkin. The virgins wore the white veil, and the widows a black veil. The custom of the widow was to marry the nearest kinsman of her husband, and if she had no children to her first husband, the first child of the second husband was named after the first. Daniel before his death told them to get their boats ready, for they would soon have to leave. His son Daniel succeeded him, and was placed in the marble chair, with his feet on Jacob's pillow and anointed with oil. "The priest then offered a lamb for his original sin—a type of the Messiah who was to carry away the sins of the world." A young queen of the Gentiles wished to marry Daniel, but he refused. After this the people of the land —worshippers of Vulcan — "fell wrath" with the "Trojans," and told them to leave the country. They agreed to go. The marble chair and Jacob's pillow were again put in the boats, and they prepared to depart. Few, however, would leave their fields and houses; so most of them remained and worshipped Vulcan. The queen ordered a high scaffold to be made and a large fire near it, so that she might see the departure of the "Trojans." Then Lazarus brought a pair of doves to the shore to offer as a peace-offering, and whichever way the smoke blew was to be a token of the way the boats were to be steered. Lazarus, Daniel, and the elders got into the boats; the others stood mocking at them. The queen looked after the boats till she could see them no more, "when she uttered a loud cry and flung herself into the fire, as a sacrifice to the god Cupid, for the sake of the Trojan prince Daniel."

The Trojans, after being tossed about on the sea, were driven on a beautiful shore near the burning mountain of Etna. They agreed with the people there for a piece of their land, and settled as they had done in Carthage. The inhabitants were surprised that the Trojans only worshipped once in seven days, as they had a god for every day in the week. When asked what god they worshipped, the Trojans craftily said the god of the sun, for fear of the idolators. The Trojans remained here for long, and built a city called Troy East. They had been forbidden to build a city by their prophets, so they were again warned that they must leave the country. They were reigned over by a succession of princes called Daniel, and of priests called Lazarus. They next landed on the shores of Gaul. Here there were few inhabitants, and they hoped that they had at last arrived at the land destined to be their home; but it was not so; yet here they lived for many a long year. Daniel, the brother of the ruling prince, died, leaving a widow and family. The spirit of jealousy entered the prince, and he coveted the widow's vineyard and fields. He offered her four times as much for them, but she declined, and was forced to remove from her place. Daniel's eldest son died, and he

feared the other members of his family would die also. Lazarus told him the sin laid at his own door.

"Arise," said he, "go on pilgrimage for seventy-seven days; uncover thy head, so that it may be wet with the dews of heaven, and give back to the widow her fields and vineyards." The prince did according to the word of the priest, and brought a ram to be offered, and was reconciled and restored to his office. He had another son whom he called Daniel, but his brother David was older than himself. They strove for pre-eminence. When their father died, each wished to be the ruler; one because he was the elder, the other because his name was Daniel. The prophet told them to bring each a lamb as an offering. He then called the rulers, elders, and all the people together, and said, "Which of these young men will ye choose for your ruler?" All the people cried, "We will have Daniel for our prince." The prophet said, "We will enquire of the Lord by sacrifice." He put David's offering upon the altar, and "the smoke spread over the face of the whole earth round about, so that the Lord could not accept it." He then put Daniel's offering on the altar, and "the smoke arose." All cried with a loud voice, "Daniel is the Lord's chosen." The priest anointed Daniel, and placed him in the marble chair, and his feet on the stone. David went away in anger. He married, and called his first son "McIntyre, or the wright's son," as he was a wright himself. The old Lazarus, the fourth of the name, before his death called his son Lazarus, and said, "This is the third generation from Lazarus the prophet, who said that the Lord would provide a land, but that it would be the third generation from the present who should possess it. This shall come to pass, and be sure that when thou comest to the land that thou givest to every man according to the number of his family." Daniel was placed in the marble chair, and the young Lazarus on the stone, his left hand round the prince's neck, and his right hand under his thigh, and he made him swear that they would have no quarrel, for there were to be no inhabitants in the land they were going to. He exhorted all to lay up a tenth of their stores for the day of departure which was at hand. Famine soon drove an army of gentiles down on their fields, and those who obeyed the words of the prophet escaped in their boats, taking the chair and stone with them. The rest were soon scattered. Some fled to the mountains, and became "the faithful Waldenses"; some were killed, some sold as slaves. The boats were driven near the coast of Wales, but the large stature and ferocious aspect of the inhabitants forbade their landing. One of the boats was driven away or lost. They were ready to perish with thirst. The prophet ordered a young man to cast his hook into the sea, and he caught a sturgeon, which was offered a sacrifice on Jacob's pillow. Rain fell, and their boats were nearly filled with water. They were near the shore. McIntyre and Daniel strove each to be first to land. McIntyre was likely to be first, and Daniel seizing a hatchet laid his left hand on a block of wood, and with his right hand cut it off, and clutching it by the fingers pitched it on shore, crying, "I take God and man, moon and stars to witness that my flesh and blood reached the shore before McIntyre."

This extraordinary narrative extends down to the reign of Alexander, betrothed to the Fair Maid of Norway, and is of thrilling interest, as it enters into the details of the intestine wars and coming of the Romans. The MS. is thought to have been brought to England with King Edward's chair. It will be hailed

with great interest by Anglo-Israelites. In the second number we shall review the Phœnician connection with Britain, and later that of the Greeks, as detailed by the Phœnician, Greek, and Latin historians and the old English chroniclers, who confirm the story of the Trojan peopling of Britain.

The Lacedemonians, a Greek nation, in the Book of Maccabees, chap. xii., claim to be the brethren of the Jews.

(To be continued.)

ART IN GEOGRAPHY AND ETHNOLOGY.

THE arts of a country are a panorama of its men and its scenery, and embody the characteristics generally of each, with vividness and truth.

The art relics of Egypt and Assyria, so far as they have come down to us, embody the ancient life of these nations. The Assyrian sculptures of gigantic size, bold in execution, grotesque in design, frequently combining in one figure portions of the outlines of several animals, generally powerful, as the bull, the eagle, the lion, on which the head of a man is often engrafted, appear to embody their faith in Deity and its attributes. But for this mystic symbolism, the human mind of the present day would be lost in wonderment at the folly of such architects of unprofitable, grotesque, unreal works. The state of preservation does not permit us to form valuable conclusions on the harmony between the colouring of Assyrian paintings and the natural objects of the country of their production, but the sculpture is sufficiently significant of a people great in energy as well as in power of submission to a centralised power, but who are unable to execute an accurate representation of any natural object, more especially of the human form. Such a nation could not therefore hold continuous sway over widely scattered nations. They could conquer and subdue them, they could rase their edifices to the ground, but they could not impart to them their own civilization. And why? It was not founded on nature, like that of Greece and Rome. Egypt also constantly repeated grotesque forms, either of natural objects or of combinations of them, each having a symbolic meaning, whose elaborateness as developed in the system of Egyptian hieroglyphics is altogether unique. What comparative and imaginative minds must these ancient Copts have possessed! The colouring materials used in Egyptian paintings of home production, with perhaps the exception of the gilding and its permanence, is to be attributed to its consisting of raw materials, dull browns and reds predominating, the complexion of the population; the white, so abundant, illustrating the white dresses which from the earliest times to the present have been so much used in Egypt. The pyramid, the most conspicuous of Egyptian forms, is the reproduction of the delta of the Nile. The Egyptian representation of the human form, while preserving some characteristics of national physiognomy, yet is false to the details of nature; hence Egypt, though civilised, was an imperfect civiliser. The same may be said of the Phœnicians, who early scattered their arts over Europe, and were, with Egypt, the parents of Greek civilisation. Phœnicia

was the father, Egypt the mother of Greek art. But the child grew to a stature greater than its parents'. Greek art was gradually developed from a close study of nature, by men in whom a taste for the observation of natural objects appears the most prominent characteristic. But this was united with a spirit of philosophical enquiry and a love of the beautiful which prompted them to copy principally the most lovely objects in nature. There is a harmony and correspondence between the beautiful forms of men and their work. Thus a perfectly formed man most appreciates and most easily produces works of the best proportion and greatest beauty. Hence the finely-formed Raphael, Michael Angelo, Leonardo da Vinci, Rubens, Vandyck, Sir Thomas Lawrence, and many other painters produced works illustrating their personal beauties. The Italian painters, personally distinguished by noble, chiselled features, produced works exquisite in form; the bright-complexioned Rubens and Hogarth, works bright and true in flesh tints. Time has wasted those records of Greek and Roman painters, so as to give us but a delusive notion of their skill as colourists. It is a dark veil that mediæval times have thrown over the arts of these master nations. What the Roman sculpture lost in the ideal representations of the human form was gained in a more truthful representation of individual portraiture. The subtlety and refinement of the Greek was replaced by the vigorous massiveness of the Roman. The Greek leopard was conquered by the Roman lion. The man subdued the woman. The concentration of talent and wealth round the city of Rome developed the details of civilisation in the Augustan age with more completeness than had ever been done before, so that Rome became the focus for the talent of all Europe. Practical material life was what most flourished in ancient Rome; psychology being less studied than in ancient Greece. Hence but little of the emblematic is seen in Roman art compared with that of Greece.

In natural as in artificial machinery, fabrics last but for a time, unless their various parts are the subject of frequent renewal or repair. This common rule applied to the Roman empire, but its various parts had a vitality which enabled them to enter on a career of separate existence, because they were endowed with a separate life and had attained to it before they were associated with the Roman name. The tools forged by the Roman builders were broken in the chaos which accompanied the fall of Rome. The various members of the image of iron and clay had to employ such tools as had descended to them from primeval times. The generation which saw Rome fall saw a great decline in skilled labour; fine arts decayed, and useful and necessary arts were principally maintained. When Christianity began to borrow the ceremonies of paganism, the Greek and Roman, but especially the Teutonic, deities were modified as models for Christian saints, and pictorial art began to develop in illuminations of manuscripts. Those who executed them being chiefly ignorant of the art of perspective—true, natural drawing—they were induced to copy, in rude outline, geometrical forms, and supply the place of shade by gilding and vivid colouring. The chief teachers in these arts were the Byzantines, the chief distributors of the knowledge the Venetians. Art flourished in convents and monasteries, in climes where the hues of the sky were most pure and vivid, to be reflected in these bright illuminations, which very brightness was transferred to countries more gloomy in their atmosphere. Greece, a country warm throughout the greater part of the

year, enabled mankind to wear less clothing than in northern Europe; hence the naked character of ancient Greek sculpture, and the knowledge of the external anatomy of the human form which such facilities for observation induced. The return to the close study of Nature induced Giotto to revive the art of perspective, and Michael Angelo similarly to revive natural sculpture —this was at the daybreak of modern civilisation. Such good work was done then, and so many relics of it have been preserved in various European countries, as well as of the times that have succeeded to the present day, that we are enabled to commence a systematic review of history, geography, and ethnology in art.

The Italian sky, clear in its blues, its yellows, its violets, its reds, its rainbow tints, has inspired a vivid colouring, which at one time was pre-eminently characteristic of Italian painting. Time has faded the brightness of these glories of the canvass to an autumnal brownness or of the yellowness of a golden eve, so that a bright light, and perhaps a bright imagination, is necessary to inspire them with the hues with which they were painted. Still, there is an elevation, a refinement, and a power about the best pictures of Italian artists, which cause them to rank, on the whole, higher than those of any other country. The Italian mind comprises the strength and depth of the Teuton, with the refinement, imagination, and delicacy of the Greek. These are the principal qualities which produce grand art, and are eminently conspicuous in the works of Michael Angelo, Titian, and Paul Veronese; while the Greek character is nearly purely found in Raphael, Leonardo da Vinci, and many others. Flat countries, while they may produce beautiful, are less apt than mountainous ones to produce grand works of art; so Italy, the land of the Alps and the Appennines, is the country of grander artists than Holland, the Netherlands, France, or England. Holland, the flattest of these countries, is not the land of high art, although here truth to nature and skill in manipulation cause the Dutch painters to surpass, in the reproduction of their models, those of all other lands. That they do not attain the highest rank is because their models and surroundings are not of the highest class.

The Flemings somewhat resemble the people of Northern Italy; if not a Celtic-Teutonic race, they are a type intermediate both in physical appearance and in qualities of mind. The rich banks of the Rhine, the blue Moselle, illumined by the summer sun, have inspired brilliant colouring, which only requires a people possessing the industry and mechanical skill of the Flemings to produce works second only in merit to those of Italy, although the grand ideal is but little in common with the Flemish school. "The grizzly saints and martyrs hairy" are better done than "portraits of the Virgin Mary." Rubens, commonly called "the prince of painters," undoubtedly stands at the head of the Flemish school, and is certainly both a grand colourist and a faithful depictor of the human form. Although not highly skilled in the illustration of those depths of pious sentiment, allegory, or refined beauty which have won celebrity for many other artists, still his naturalness, has given to such paintings as his *chef-d'œuvre*, the descent from the Cross, in the cathedral at Antwerp, a grandeur not to be excelled by any but the finest works of more refined and idealistic schools. What a contrast the works of Rembrandt present to those of Rubens! The models of the former are pre-eminently grotesque, yet so expressive in physiognomy as to rivet us by their force. They are illumined by

a light which proclaims at once a star of the first magnitude, whose very brilliancy intensifies the darkness, in these corners apart from its rays. O Chiaroscuro, soul of painting either with brush or words, it is thy power alone, to institute magic in art. Rembrandt's landscapes, paintings, engravings mostly display extraordinary skill in the management of light and shade. The most homely scenes and features appear grand merely because they have caught this celestial inspiration. Van Ostade had many of the gifts of Rembrandt, and more patience for the execution of those exquisite details which exist in nature, and which are the artist's master. Teniers was a prodigy as an art workman. He possesses the vivacity and humour of a Frenchman, with a knowledge of physiognomy and general effect such as no other artist has ever surpassed. Teniers was a humourist rather than a caricaturist, a transcriber of myths, as well as an illustrator of domestic life, in all its truth and simplicity. Wilkie has been called the Scotch Teniers, but in no quality of art was he his equal. We are speaking of David Teniers, whose productions are superior to those of his father Jacob. Jan Steen, also, and Brauwer were most vivid and humourous illustrators of human character. They are more true to nature than Hogarth, but do not attempt to illustrate story. Groups of figures are depicted, such as occur in daily life, without any distortions, except those which natural physiognomy or moral degradation induce. About both the Flemish and Dutch schools there is a profundity of feeling which is not found in Italy or France, even if we are compelled to admit that there is a want of grace in the postures, and refinement in the expression. French art is mostly deficient in profundity, however clever it may be in anatomical drawing, or graceful in its contour. Frenchmen have, however, produced works pre-eminent for grace, beauty, and solidity; but such a combination of qualities, we are inclined to believe, proceeds from an infusion of Teutonic or Gothic blood. French art is French history, geography, and ethnology; the epitome of the nation. See it struggling in the days of Henri II., to fuse its discordant elements into unity, and to enlarge its boundaries over the provinces of its neighbours. In the days when the House of Lorraine had France by the throat, progress may be noticed, but a scanty development of high art. "Henri Deux ware" Limoges enamels, and a little good portraiture were its highest effort. The master mechanic of the age was Palissy, outside the pale of Catholic civilisation. The high art of France was borrowed from the source from which she took her religion—Rome. With the decline of the power of the Guises, and the advent of a Huguenot king, Henri IV., came a gradual development of a truly national French art, which culminated in such men as the Protestant Sebastien Bourdon, the Raphael of France, or Valentine, its Jordaens or Rubens.

There is much purity in the conception of Bourdon, undoubtedly the first of great French artists, and the last, for Catholic France has never been able to produce another Bourdon. The wars of the Fronde, and the persecutions induced by Louis XIV. drove high art out of France, and left a school fitly reproducing the voluptuous lives of Louis XIV., Louis XV., and Louis XVI. Boucher, Lancret, Watteau, graceful and artistic admittedly as their productions are, yet lack those elements of nobleness which are created rather than made. Descartes, Buffon, and Pascal were the greatest French natural philosophers of these ages, and have left names that will be honoured in every age; and Racine, Corneille, Molière, La Fontaine,

and Fenelon were literary geniuses of the first order, pillars of the French language and literature, whose fitting illustrators are the painters Oudry, Desportes, and Stella. Voltaire and Rousseau, the demons of French literature, the unclean spirits like frogs that swam in the French brain, cast forth that spawn of poison which bred the fever of the great French Revolution, whose putrid relics are the parents of all the numerous French revolutions that have succeeded. Ferments, fevers, and fungi flourish in unhealthy places, and are often the means of ridding a country of rottenness and corruption, by promoting entire dissolution; so the crimes of Catholic France, and of its master Rome, received a severe indictment from Voltaire and Rousseau.

Louis David's life comprised the reign of Louis XVI., the period of Revolution, the reign of Napoleon the great, and of the Restoration.

No artist that France has ever produced is more typical of the nation. Great in design and brilliant in execution, with a versatility almost equal to that of Rubens, he possessed a skill in drawing the human figure worthy of the Italian school, and a commanding force of style which rivetted the common observer and induced imitation in every school of art in Europe. He was the Napoleon of French art, who not merely ruled in France, but whose sway extended over other lands. But David was not a true interpreter of nature, and so posterity refused to sustain the reputation acquired in his life. Like the exiled Corsican, he was dethroned and pronounced an actor, a fit occupant only for a theatrical throne. Had David spent his talents more in the study of nature than in the Greek ideal, and had he been more content to follow rather than to lead, he would have been less the slave of vain-glory, and more honourably remembered than he is now. The followers of David cultivated affectation with a zeal which has now made them contemptible.

Fortunately, the size of France, its varied population, and its physical resources, have developed within the last thirty years a school of true portraiture in human and animal life, which will compare favourably with that of any age, such as is worthy of France, of its agricultural wealth, of its mechanical skill, of its information. But it is all self-illustration. French artists do not travel much, except to make topographical sketches. Belgium has, within the memory of those who are still young, made art nature, and nature art in all its exquisitely rich simplicity. Hobbema and Ruysdael among still-life painters have been rivalled; Rubens, Sneyders, and Landseer amongst animal painters have been outdone. In the modern schools of Italy we see the rising glories of Victor Emmanual's new united kingdom. But for the successful competition of the artists of England, Germany, Belgium, France, Scandinavia, and even Russia and Spain, Italy would be looked to as a great garden in which pictures are grown. Germany and Scandinavia are rich in artists skilled in drawing domestic life and the delights of calm, placid, contemplative, never-ending nature. If there is less grace in German art, there is more of mysticism and spiritualistic apprehension. Albert Durer, the founder of the German school, had not entirely struggled out of geometrical drawing, and his followers, remembering that Germans themselves are built on the square rather than on the round principle, have continued to illustrate their national form. German art has much mannerism, and is rather deficient in the line of beauty and of grace; that curved-line which the Englishman Hogarth conceived

to be the elementary principle of beauty in the human figure. Let figure-draftsmen, therefore, beware of assuming a German mannerism; this is as objectionable in drawing as in literary style.

England, the great home of fine-art patrons, the great country of picture galleries, the safe proof against the fires of revolution, was long without a national school of painting of her own; Holbein, Janson, Van Dyck, Lely, Kneller, English court portrait painters, were men of foreign birth. The historical and landscape paintings, which till the days of Reynolds lined the walls of English mansions were of foreign importation.

Sir Joshua Reynolds was one of the first founders of the English school of paintings; he was grand and true in his portraiture of man as he is, but was not sufficiently gifted in imagination to be as successful an illustrator of the ideas of others. Walking in the paths of fashion when apparently necessary for his interests, his professional success enabled him to produce works of magnitude which his more original contemporary, Hogarth, could not afford time to produce. Of all painters, Hogarth is the most uniquely dramatic; you read his pictures as you read a book. Characters are there—all his own creation, yet containing so much of nature, although perhaps in its uncommon aspect, that the most unintelligent is rivetted and amused. The reward of virtue and the penalties of vice are side by side contrasted with more force than in an ordinary pulpit oration, while follies are curtailed and made to shrink into their shells by the whip of satire, which both tickles and stings. Hogarth was a true colourist, a true draftsman, an uncompromising, brave, honest man, one of England's worthies, of whom she may be for ever proud, one of the world's representative artists, who from being highly appreciated outside her narrow walls, England may send as a perpetual representative to the eternal congress of European art.

Gainsborough, the rival and contemporary of Reynolds, was great in animal painting, female portraiture, and in the delineation of rural life. He is another of those representative artists of whom England may be proud, an honest depictor of the beauties of English life. Sir Thomas Lawrence, pre-eminently the chronicler of the fashionable life of his day, was an artist of great merit, although not free from affectation, and better calculated to draw the heroes of the stage than the highest types of mankind.

The wealth and peacefulness of England has fostered the development of art-painting in England to a greater extent than has ever been known in any country. Being a travelling, surveying, nature-loving, modest-attired people, we do not study, and therefore do not draw, the human figure with the ease and accuracy of the French, Italian, Flemish, or Spanish artists. But we cultivate and successfully treat English homesteads, woods, sea and sky, and their living denizens, so as to carry into the well-pictured room a perpetual remembrance of the outside world—

> A populous solitude of bees,
> And many fairy-formed and many-coloured things.

Turner and Constable, opposite poles in the eyes of such critics as Ruskin, perhaps illustrate English landscape-painting better than any two painters, although a host of wonderfully truthful artists, whose very names would fill a page, have helped to place this country foremost in landscape painting. But to our mind it is doubtful whether the finest productions of England's landscape painters surpass those of the modern Belgian school,

whose still-life has a transparency and an eloquence of nature which a more sunny clime has perhaps inspired, but which our misty climate and exquisite mottled skies of blue, white, and varied tints do not foster.

THE ROYAL ACADEMY EXHIBITION OF OLD MASTERS.

THE leading characteristic of this year's Exhibition is the extensive representation of the Norwich School, which was founded in 1805, by John Crome, known as "Old Crome," and contributed to by his pupils and followers, John Sell Cotman and Joseph Stannard, George Vincent and James Stark. Crome was especially distinguished by a love of nature and a bold treatment of his subjects. He must have sketched much in the open air to have been able to transcribe English scenery with the fidelity with which he did. One of the most striking of his works is the homely subject of a lime-kiln, No. 46, and exhibited by Mrs. Temple Silver. The light comes from the blazing kiln, and renders visible a cottage and trees, water and ducks. The genius of the artist produces a splendid picture with these simple materials. The view of Norwich, No. 48, belonging to Mr. Samuel Gurney, and the wood scene, the property of Mr. John Gunn, are magnified Ruysdaels, yet they are by John Crome. The Yarmouth water frolic, No. 44, is an unfinished picture; at least, it has this appearance. James Stark would have thought it unfinished; his pictures remind us of Ruysdael or Hobbema, but he is not content with the subdued olive green and yellow blendings in which these great masters of landscape painting delighted — those dull weather tints which make us fear the approach of rain, or a storm, or dull chilly winter,—but Stark knew how to use reds, not with the meretricious and glaring effrontery in which the vulgar painter delights, but with that skill of an eye which sees harmony in the poppies of a cornfield, or the Red-Ridinghood skipping through a green lane, or a little scarlet pimpernel opening its dazzling eye in the wayside waste. These beauties and these harmonies of colour are appreciated by Stark, and instanced in No. 31, "A Landscape and Cattle," the property of Mr. George Holmes. This little picture has the high finish and minute delicacy of a Ruysdael or Hobbema, with the lovely colour we have instanced. Another is his Burgh Castle, near Yarmouth, contributed by Mrs. Charles Bolingbroke. This is also a gem, comparable to the best pictures of the Dutch school. Among the miscellaneous works of the old masters, are some excellent examples of the extremely expressive and characteristic Dutch painter, Jan Steen. He painted from nature, with but little air of conventionality, yet he was a faithful reproducer of the costumes and the manners of his times. He was pre-eminently the painter of interiors, a branch of art which afforded scope for the display of his peculiar gifts. "The Village Fete," No. 59, is a Kermesse at an inn door, delineating the coarseness of Dutch low life. Jan Steen gives a touch of humour to most of his pictures. He was a keen physiognomist, and consequently able to give the true expression to the countenances he de-

picted. His life was a sad one; he was the slave of the bottle, but yet he by satirical touches threw ridicule on the thraldom it involved. Perhaps the best example of his work here is "The Doctor," who is feeling the pulse of a young girl. She, like most of Steen's female figures, displays little beauty, and is wanting in intellectuality of expression. Her Majesty the Queen has sent a bedroom scene, in which a girl is putting on a stocking. This picture has little to commend it in delicacy, grace, or beauty, but it is a vivid illustrator of the costume of the period, and is finished with great care, and is moreover in an exquisite state of preservation. No. 91 is a portrait of David Teniers the younger, by Frank Hals. Although a good picture, it has not sufficient vigour and loveliness of expression to be a true representation of Teniers. What a contrast even the average portraits of Vandyke, great as are their artistic merits, to the portraits of Rembrandt, perhaps really the best of all portrait painters. His faces are full of character: this character is vigorous and original. The colouring of such as are well preserved is true to Nature. They are drawn with a knowledge of the lines of the face, those wrinkles which time carves upon the brow, and which are as essential to the true delineation of the human countenance as are the rocks, the defiles, and the roads of a landscape. Fashion, the enemy of true art, while professing to be its patron, has driven painters away from those sure foundations of character, the human wrinkles, and caused them to subside into habits of the delineation of only the smooth and the so-called beauty, which is as far removed from nature as is the cold-white marble transcript of flesh. But Rembrandt, unlike Sir Thomas Lawrence, unlike even Sir Joshua Reynolds or the much-vaunted Gainsborough, was not to be led away from the path of Nature by the seductive flatteries which fill the purse; therefore Rembrandt died poor, but he spent his wealth of genius in coining fame rather than in coining money, and as he did not enrich himself, did what was better, he enriched the world of art. We know little of the life of Rembrandt, but we may read him in his works, and in the numerous portraits of him at different stages of his life, which he has painted for us. He comes before us always as a man vigorous in expression, yet this expression is to a certain extent smothered by a love of retirement, of shrinking into the very shell out of which these gems of genius are evolved. Rembrandt, unlike Rubens, did not appear to be large in his human sympathies. One of his most pleasing portraits of himself is 98. He is 28 years of age. In that silent face we view a meditative soul from which one may rather shrink, from its sullen reserve and extreme sensitiveness to public opinion, although with all the strength of mind to defy it. Such were this painter's characteristics. A very fine portrait (102) is that of a man, a Dutch Burgher, a suitable companion for Grotius, De Ruyter, or Van Tromp, full of the self-contained power which drove back the sea, the Spaniards, and the French, and drove ships before the wind to colonies which have made the Dutch nation the richest in the world, in relation to extent of territory. The two portraits, duplicates of a Jewish rabbi, are stamped with profundity and vigour, characteristic of the older school of the tribe of Judah, but which appear to be vanishing in the younger Hebrews, who are so rapidly assimilating to the peoples among whom they dwell. Rembrandt in old age is powerfully depicted by his own hand in 171. Rembrandt's mill, which is in this exhibition, has been called the *chef-*

d'œuvre of landscape painting, and surely he is a great painter who can with such tools produce such noble results. Rubens never produced a landscape equal to this; neither has Turner. Here is the setting sun, with an old mill on a rising ground on the left, a river running on the right, deep shadows below painted to defy time.

Rubens, perhaps the finest flesh painter, is represented by works of very high merit. Herodias sits beside Herod in 168, and receives on a charger the bleeding head of John the Baptist from her daughter. She is unconcerned, while Herod shudders at the sight. The picture fails as a work of expression, but is admirable as an example of flesh painting. Many anachronisms appear. The scene is Jewish, executed with such palpably Flemish materials as to lose almost entirely an Oriental character. Rubens is represented by a truly grand portrait of a Flemish gentleman. No better representation of skin painting could be found, and for life-expression and skilful drawing it is little inferior to the portrait in the National Gallery of John Gaspar Gevartius, by Vandyke. Gainsborough is represented by many fine works. Most of the ladies painted by Gainsborough seem to be related; they have tall, slender figures, and a similarity of expression, in which silliness predominates. They are graceful and well dressed. He was a Court painter, and conformed to the usages of the Court. Gainsborough's portraits are now the fashion, and have sold for prices lately almost unprecedented in the commercial history of art. But with all their grace and beauty their deficient character renders them of little real importance in European art. The flesh painting is indifferent; even in the best the figures are those of tall, graceful dolls. But it would be hardly possible to find one who offended against propriety, impossible to find one from whose lineament radiated a noble soul. No portrait of Gainsborough has the expression of Lawrence's Mrs. Siddons, or of John Kemble as Hamlet, although it may be said that the expression and attitude are theatrical; still, a great actor is a great man, and greatness is required to produce greatness.

Gainsborough was not a great portrait painter; his highest talent is in his perpetuation of rusticity in his boys and fighting dogs, in his children playing on a gate, in his cottage door. These are his finest works, although the numerous square yards of satin and lace which adorn the walls of Burlington House are capital specimens of hand work, and by their pleasing colouring are infinitely better than paper.

Canaletto, or Antonio Canal's view of Whitehall, is as fine as possible a record of London topography. Compare that picture with the present aspect of the spot. What changes time has wrought. The Government offices now stand as it were on this picture. It is equally valuable as a chronicle of costume; there the Court ladies walk about in their farthingales, the progenitors of the modern crinoline. These two designed to assimilate the female figure to that of a hen-coop. Modern fashion in revolt aims at simulating a wine bottle. Honest records of current life are among the most valuable contributions a painter can make to art, infinitely better than the delineation of other men's ideas, or conventional portraiture.

How meretricious is the colouring of Emma Harte, Lady Hamilton, by Romney. Her cheeks look painted, not by the circulation of the coral veins, but by the application of the colouring of the cochineal insect, variously known as rouge or carmine. She was the Delilah of Nelson. This exhibition displays several Terburgs of great merit—a painter

whose works command a high auction price, and who is certainly a master in the delineation of the human countenance. There is an individuality about his faces which renders them valuable as portraits. He was not content to draw *a man* or *a woman*, but insisted on drawing *the man* and *the woman*; hence the competition for such pictures as "The Congress of Munster," where amongst the crowd of heads every one represents an individual. The lady at her toilet, No. 157, is a representation of a refined treatment of a subject, and may well be contrasted with the bedroom scene of Jan Steen's. Steen's has the air of vulgarity, Terburg's of gentility.

Jan van Os, judging from the flower and fruit-piece No. 159, was a painter of merit equal to Huysum. The drops of dew on "a rose just washed from a shower" are truly natural. Such pictures can rarely be copied without bearing the stamp of copies. Figure pictures, which abound in pleasing composition, may be followed mechanically, with the result of producing what may be passable, mistakable for antique originals when passed through the ordeal of a smoke house, or smeared with a yellow brown-varnish ; but a transcript of nature in all the exquisite details, which almost rival Nature herself, is impossible to the art manufacturer. It has an authography which defies forgery.

Another characteristic of this exhibition is the fine show of the engraved works of Sir Joshua Reynolds, Gainsborough, and Romney, mostly executed in that exquisite mezzo-tint style which is almost an art of the past. Among these engravers, Valentine Green, Edward Fisher, Charles Howard Hodges, James Watson, William Dickenson, James McArdell, John Dean, J. Raphael Smith, John Jones, Henry Hudson, and Charles Turner hold a conspicuous place. This art of mezzo-tint combines softness with definiteness, which a touched photograph endeavours to rival, but it cannot compete with mezzo-tint, neither can mezzo-tint compete with it. The engraver is a translator who represents as closely as possible, but with other forms of expression, an idea. The photographer is a copyist who rides to his work in the chariot of the sun. The Royal Academicians have wisely supplemented paintings by engravings, which are not merely beautiful in themselves, but which are the means of concentrating together forms which cannot be concentrated in their original colouring, either from the fact of their having been consumed by fire, or from the unwillingness of their present possessors to allow them to come to Burlington House.

BIRD LEGISLATION AND VIVISECTION.

THE last few years have seen the passage of several Acts of Parliament tending to protect animals in various ways. Mr. Sykes's Bill for the preservation of sea-birds was the first of the series, and Mr. Lowe's ten-shilling gun-tax was a real benefit to the feathered race. Mr. Johnston's Bill, originally devised to protect wading birds during the breeding season, was, by Mr. Auberon Herbert's exertions, altered to include small birds beneficial to agriculture. It became law, and although, from the defects of its structure, there was a difficulty in enforcing the penalties "made and provided," yet its moral influence was sufficient to protect greatly the farmer's friends. It is worth while to consider whether this Act was of practical benefit to the farmer.

Seventeen years ago I ventured to predict that an enormous increase in the value of crops would take place two years after the passing of a Bill for the protection generally of insectivorous birds, and this, with all its shortcomings, was certainly done by the Wild Birds Act of 1872; and I urged this as a plea for further legislation on the subject, with a view of protecting a greater number of insectivorous birds, and otherwise amending a few flaws in the Act of 1872. I shall now endeavour to state the evidence for such statements.

Agricultural statistics, such as we can find in other countries, are not to be obtained as regards England and Scotland; it is therefore necessary to obtain our information indirectly, and infer from the quantity of food brought into Britain the quantity required for consumption, the imports being in exact relation to the crops; that is, when there are scanty crops in Britain there are large imports from abroad, and *vice versa*; added to which I have the estimate of the *Mark Lane Express*, which is prepared annually from the observations of some hundred correspondents in various parts of the country, on the extent of the crops of each year.

In the year 1872 wheat to the value of £26,169,185 was brought into this country from abroad: this was before the Act operated. In 1874 the value of the wheat brought into Britain was £25,236,932, which leaves a balance of £932,253 saved by the birds.

Of other corn and grain there was imported into Britain in 1872 to the value of £20,938,366. In 1874 £20,080,122, which gives a balance which the birds saved us on corn of £858,244. In 1873 the flax imported was of the value of £5,294,834; in 1875 the flax imported was of the value of £4,379,740, which leaves a balance of £915,094 saved by the birds.

The above figures are taken from the Board of Trade return laid before Parliament.

There is another very important element in considering a question like this, and that is the progressive increase of our population, who are annually consumers of food at an increased amount in proportion to their increasing numbers. The British population is supposed to increase annually by 300,000, which would for the two years 1873 and 1874 give 600,000 more persons to be provided for with food, either home-grown or imported. If for the sake of argument we estimate the grain and green food they eat, and the animals they feed on, to be worth £10 per annum for each

person without separating classes, taking for granted that the poor will spend less and the rich more than this sum, we have £6,000,000 worth more of food required for the two years specified. If we add this £6,000,000 to the amounts saved by the birds on wheat, £932,253, on corn £858,244, flax £915,094, we have a total of £8,905,581 due to our friends the birds in this short time, on the matter of the crops of 1874.

The *Mark Lane Express*, in a leader dated December 21, 1871, says that in 1870 the return on the yield of wheat was from most parts under an average. In 1871 this was still worse, while in 1872 it was thought that we had reached the minimum of production, although the result in 1873 was not more favourable. The reaction has indeed been extraordinary, as the following summary of advices will show :—

	Advices.	Average.	Over.	Under.
1872	454	78	22	354
1873	445	84	17	344
1874	432	81	328	23

Thus it will be seen at a glance that the under and over have, as near as may be, precisely changed places, and we find that for the production of wheat 1874 ranks proportionately as good a year as 1873 and 1872 both did as bad years. The following fuller tables will help to tell the story out, and seem to complete the comparison on all the corn crops grown during this period :—

	Wheat.	Barley.	Oats.	Beans.	Peas.
1872.					
Over average	22	41	103	72	48
Average	78	185	226	166	146
Under average	354	211	101	85	158
Smaller growths	7	24	31	138	109
1873.					
Over average	17	86	71	47	39
Average	84	266	233	169	206
Under average	34	74	109	97	91
Smaller growths	7	26	39	139	116
1874.					
Over average	328	98	37	9	13
Average	81	181	139	85	115
Under average	23	134	227	213	198
Smaller growths	7	26	36	132	113
Total for 1874	439	439	439	439	439

I have not had material for estimating the value of the flower, fruit, and small seed crops of 1874, so as to be able to put the amount of increase down in figures, but it must have been many millions in extent over 1872.

In 1875 the weather for corn was unusually bad, and there was a corresponding increase in the amount of corn required to be imported. This, I confidently believe, would have been of an unprecedented amount but for the aid of our

friends the birds. But it must be borne in mind that this year 900,000 more people at least had to be supplied with food than in 1872, which gives an additional value of £9,000,000 to the grain crops required for 1875; which I believe would not have been attained but for the friendly aid of our birds. Therefore in this year of extraordinary disaster to the farmer he was able to pay his way through the aid of our friends the birds. Thus in 1872 the wheat imported was £26,169,185, the corn £20,938,366; and the total imported in 1872, £47,107,551. The total imported in 1875 was £51,786,393.

But for the birds a population increased by 900,000 would have required the importation of at least £60,000,000 worth of grain. Birds will not make crops grow; they can only, by destroying insects, give them a better opportunity of growing. Weather, the special gift of Providence, must always be the chief regulator of crops. In ten years I believe that the birds will save us an annual average amount equal to the interest of the national debt, that is ten years after the date of the passing of the Act of 1872, provided that it is not repealed.*

A few words may be profitably said on the Government Vivisection Bill of 1876; for it seems to have been to a great extent abortive. The blundering draftsman of this Bill seems not to have been aware that while for the first offence a penalty of £50 might be imposed, for the second or subsequent offences the court before which the case is tried is placed altogether above the statute, so that it can impose no penalty at all if it please. By the third clause the following restrictions were to be imposed: "The experiment was to be performed only with a view to new discoveries for prolonging human life or alleviating human suffering, and to be performed in a registered place, and by a licensed person, the animal being the whole time under the influence of an anæsthetic, and be killed before it recovers from the effects of the anæsthetic."

During last spring I was returning from a meeting of the West London Science Association at about 11 p.m., and was passing through a street in Bayswater, which was blocked by a crowd. On enquiring the cause, a dog was pointed out which had a large portion of the skin of its back removed, and which, writhing in agony, had been mercifully despatched by a bystander. I was further informed that this animal, a fine retriever, had been that evening a victim to vivisection, that a party of so-called scientific men had assembled in a greenhouse to witness certain experiments which necessitated the removal of a large piece of its skin. The animal was placed under the influence of chloroform, and the operation proceeded. To the annoyance of the operator, the dog recovered too soon from the influence of the anæsthetic, and by a convulsive effort, jumped through a pane of glass, and escaped into the street. Loud and great was the indignation of the bystanders that Bayswater should be the scene of such cruelty, more especially as the dog was a favourite in the locality. On enquiring who the vivisectors were, I was told that they and the place were unlicensed, and that the experiment was for the purpose of demonstrating well-known facts. One of the witnesses promised to bring the matter before the Royal Society for the Prevention of Cruelty to Animals, but I never heard that it had been done. Surely something more stringent than his Lordship's Act is required for the protection of our domestic animals.

C. O. Groom Napier.

* In the next number of "Burlington House" the recent *projet de loi* in the French Senate and the requirements of European bird legislation will be reviewed.

THE DEPRESSION OF TRADE IN BRITAIN: ITS TRUE CAUSE.

MR. JOHN RUSKIN, in the number of his "Fors" for July 1875, says, "The moment any nation begins to import food, except such as its climate cannot produce in exchange for such as it can, its political and moral worth are ended." There is much truth in this statement, for a nation surely loses its independence when it leans on foreign countries for the supply of the necessary staff of life. Colonel Peronnet-Thompson and Colonel Torrens, when advocating in 1845 and 1846 the repeal of the corn laws, predicted that butcher's meat and dairy produce and garden vegetables would be more in demand, and that there would consequently be an increased rather than a diminished profit from agriculture. In consequence of the impetus which Free Trade gave to commerce, and its expansion beyond limits which had been hitherto reached in Great Britain, the demand for foreign luxuries increased as wages, salaries, and incomes rose in nominal amount. But as extravagance appeared to increase in as great or even a greater proportion than income, the majority did not benefit at all in proportion to the apparent expansion of their resources.

The increased demand for butcher's meat caused it to rise very much in price. As it is an article of food which will not come so conveniently from abroad as grain, this rise in price was not much kept down by imported meat, and so it continued to rise, and must eventually rise, almost in a like ratio with the increase of population, until a large proportion of the population become aware that they can gain little and must lose much by their extravagant consumption of butcher's meat.

The British soil could support, out of home-grown food, according to Sir Richard Philipps, in his "Million of Facts," two hundred and fifty millions of inhabitants on vegetable products, without the cultivation of the thirty million acres of land which he then estimated as waste.

Surely, if anything approximate to this is true of the resources of British soil, it becomes the thoughtful of us to consider how far we can increase the resources of our country so as to prevent the drain on it required for the purchase of so much grain with British gold. The average annual purchase of grain from foreign countries amounts to a sum quite sufficient to enormously stimulate other industries or branches of trade if it could be saved or expended upon them. Could the amount which is annually spent on grain be expended for a period of from ten to twenty years upon the British soil, on judicious improvements in ploughing, manuring, draining, soil making, and approved seeds, there can be no doubt that Britain might save in the end the full amount that she spends on foreign-grown grain. Every years adds to the importance of this subject, for our population is increasing, and our consumption of flesh is also increasing, and I believe the production of grain is somewhat decreasing as regards a ten years' average in relation to population.

If the population of these islands increases in the ratio that it has done, fifty years hence the excessive demand for food exceeding supply will cause such an expenditure of our resources for the purchase of the necessaries of life as to render our country very much impoverished. As this must entail much suffering upon our children and grandchil-

dren, it becomes us while we are yet strong, before the vast resources of capital in Britain have been attracted from our shores for the requisite purchase of the necessaries of life in foreign countries, that we should endeavour to get it invested in developing the resources of our own country, which would not then fail in wealth. Recent investments in foreign countries, which soon fail to pay any interest at all, have drained a very large portion of the floating capital from our shores. This money might have been solidly invested on British soil but for the ignorance of the British public of the foreign borrower's capacity to pay. If an English investment pays a solid five per cent., a foreign investment is represented to pay from six to twelve per cent. But this promise of profit is in the majority of cases delusive. The capital and interest alike disappear.

Improvements in the resources of the British soil may be divided into four heads,—

1st. Improvement of Crown lands by the cultivation on them systematically of cereal, leguminous, vegetable, and fruit crops; their better manuring, and with especial attention to forest-tree surgery and the ravages of insects in timber. The state of the Crown forests is so scandalous as to call immediately for energetic reform. In order to induce reform, a Royal Commission should be at once established, with power to take evidence.

2nd. Much land might be recovered from the sea, especially in the estuaries of such rivers as the Thames, the Dee, the Humber, the Clyde, and the Severn. This land would be available for market-gardening, and might be expected to be very productive. Certain lakes might be drained, such as Lough Neagh in Ireland.

3rd. Much bog and hill-land might be cultivated, and the soil improved by judicious mixing of clay, sand, or lime, according as the circumstance of each case require; the money necessary for this purpose being raised on mortgage upon the soil itself. An Act of Parliament might be necessary to deal with settled or entailed estates, but no settlements or no entails should act as a bar to prevent the full development of the resources of the land.

4th. By a general survey, undertaken by a specially constructed Government office, as to the agricultural resources of the kingdom, with the view to their full development. Such survey would be a useful outcome of the recent returns of the rent and ownership of the land of the United Kingdom.

China supports a vast population greatly through the rigidly enforced cultivation of the soil. No wise political economist can advocate any considerable diminution in the area of the British forests; they might be somewhat differently distributed, and a larger number of fruit trees, particularly the pear, apple, and cherry, might be cultivated. Twenty years after such a survey, and ten years after energetic action thereon, England might support a population of forty-five millions on the home-produced necessaries of life, and at such a cheap rate and with such profitableness that her population would feel less inclined than at present to emigrate to foreign shores. Sir Richard Philipps says that our country could support eighty millions on a diet of flesh and vegetables, while two hundred and fifty millions might be supported on a diet of vegetables alone. If with eighty millions we could become the dominant power in Europe, we could with two hundred and fifty millions become the dominant power in the world. If such is the case, that the soil can support a larger population on a vegetable than on a mixed diet—

and the greatness of a country depends on its population—surely favour should be shown, all things being equal, to that diet which will support the greatest number of men. I am able to prove that the meat diet promotes the love of drink, and the vegetable diet the love of temperance, and that the vegetable diet is, in fact, the cure for intemperance. Therefore upon flesh diet hangs all that proceeds from intemperance, crime, and pauperism; and on vegetable diet, comfort, morality, longevity, both nationally and individually. Let us individually consider this, and let us nationally act on it. If one quarter of our population were to become vegetarians, the other three-quarters would obtain better and cheaper meat, but the vegetarians, by the increased economy and animal vigour and capacity for hard work which the diet induces, as well as the moral force which it inspires, would govern the other three-quarters.

In proportion as the flesh-eaters became poor, the vegetarians would become rich, as they always do who begin by self-denial.

I have now led myself up to the main object of my paper—the depression of trade in Britain caused by Free Trade; and I believe this to be really the case, for although free trade gave a great impetus to commerce and promoted the increase of the revenue, yet it rendered the country more dependent for its prosperity on foreign trade than heretofore, and diverted the attention of capitalists from a much more important element in the prosperity of the country—the development of the resources at home. Much money has been lost by ignorant expenditure and on unprofitable works in foreign countries, and through the roguery of foreign governments, due to the want of geographical and anthropological knowledge on the part of the British investing public. This might have been saved and invested had there been that proper intercommunion of trade of Great Britain and her colonies which exists between Great Britain and Ireland and the Isle of Man. Through a most fallacious notion of the evils attendant on reciprocity, an Englishman in Australia, India, and the West Indies could not send to Britain the produce of his estates without paying duties as high as alien nations. On what principle of fair play should the produce of the Englishman in India be more highly taxed than the produce of the Englishman in Ireland or the Isle of Man? This false political economy has led to the development of unsound schemes in foreign countries with British capital, and to the neglect of the development of the resources of Great Britain and her colonies by sound and solid schemes, has led to collapses which have induced panics, distrust, diminished production, and a falling revenue. Would we revive trade, we must seek by surveys, governmental and otherwise, to discover our undeveloped sources of industry, and the best method of developing them. No time is better than the present; there is a plethora of capital which its owners would gladly invest in sound and solid schemes. With the large engineering works necessary for the drainage and rescue of land from the waters, the iron trade would certainly revive. With the increased manuring of lands the chemical trade would revive. With the increased consumption of vegetables the working classes especially would have more money, from the economy they induce, to purchase clothing and other luxuries which remove men from the savage state.

The revival of this trade would render unnecessary any protective enactments to manufacturers which will certainly be demanded if the present decadence of trade continues a few years longer. They justly point to the raw material from

the British colonies being imported into France, Germany, Belgium, and Holland, and there manufactured and imported into England and sold at a rate (under the sophistical legislation induced by free trade) which enables them to compete to the ruin of manufacturers on British soil. Free trade is a mere name, a delusion, unless international. British industries are robbed that foreign may flourish by the pseudo free trade of the present day. Will those who suffer give my views a hearing and a support?

VITAL REFORMER.

ECONOMY IN FOOD A REMEDY FOR STRIKES AND PAUPERISM.

THE experience of individuals, when sufficiently extended, affords a safe guide for the deduction of a law. It may be taken for granted that industry and economy surely produce comfort, if not wealth, and that idleness and extravagance produce pauperism, and tend to encourage crime. If such is proved by many instances which cannot be gainsaid, it is open to me to produce one or two instances as types of many.

First, the mechanic whose wages do not exceed 25*s.* a week, can in London, if he has only himself to support, save 10*s.* per week, and in the country, in many cases, 15*s.* per week, provided he is willing to dispense with luxuries.

The clerk who has £50 a year can, if unincumbered, save £20 a year in London, or £25 in the country; and if his salary attains to £150 per annum, he may save a much larger proportion. I have knowledge of cases where this has been done, and where the mechanic, after saving for fifteen years during his single life, with wages never more than 35*s.* a week, was able to enter into an independent business, and marry with a capital exceeding £500, and a clerk had in twenty years saved £1,800 out of a salary commencing at £50 and never exceeding £150.

In the autobiography of a vegetarian, a true narrative of a successful career, reported by myself in "Fraser's Magazine" for July 1875, I have shown how an individual may marry on 10*s.* a week, and if his wife is a suitable co-worker with him, rise to great wealth; the individual referred to being now in possession of about £18,000 a year. But he must either remain unmarried until his position is secured, or he must obtain a wife who possesses the bodily vigour, economic instincts, and intelligence to co-operate effectively with her husband. There are very few wives who are real helpmeets; on the contrary, they devour more than they save, and increase their husbands' expenses double, threefold, or fivefold, according to their notions of the expenditure of money. If a man who commences adult life with a small income unfortunately marries an idle, extravagant person, his sole means of saving money must spring from himself; he must be what his wife "calls mean," and can have no confidence in her, but must secretly hoard his savings and give his wife as little information as he can help, on the amount of his income. This unhappy arrangement is necessary when the husband is economical and the wife extravagant. About fifteen years ago I drew up a code of rules for economy in living, for a Jew who had previously failed three

times in business, but who was willing to be advised. By perseverance for all these years in the rules laid down, he has accumulated, from a nucleus of £1, the sum of upwards of two millions sterling. This is an exceptional case, but comfort is the invariable reward of common-sense thrift.

Individuality makes the man; patronage makes only, at best, a successful slave. Individuality may be cultivated, but it is the exception to find a man who has sufficient individuality to withstand the temptations to extravagance and vice which our laws even licence, and which if he does not resist, rob him of the fruits of his industry. I refer to extravagance in diet, dress, and travelling.

"Benefit or Friendly Societies" have been contrived with a double object of promoting saving and strikes—two objects which are diametrically opposed to each other, unless we believe that both are the crafty devices of the few for the subjugation of the many. What profit can the working man derive from his benefit society if he is liable for the support of a number of workmen who, dissatisfied with their employers, have proclaimed a strike? Let us suppose those to be right who declare that labour is capital, then surely what suspends the labour suspends the capital. The working man, instead of getting stronger, becomes weaker in proportion as he strikes. He aims a blow at his employer, but, as is the case with the weak athlete, he exhausts himself by the effort. This now brings us to consider what substitute should be found for "friendly societies," which are really not friendly, but antagonistic to the true interests of the working man. It leads us up to the object of this paper: Co-operation a remedy for strikes, Economy in Diet a means of getting money for effective co-operation.

Let those who are dissatisfied with the wages they receive for their labour, and proclaim that the capitalist robs them of the full reward of their labour, bear for a season the injustice, if such it be, and by self-denial in their food lessen their expenses, until they have saved sufficient capital either to enter upon an independent business, or to co-operate with their compeers in industries which compete with those of their masters. If they do not succeed by this course, they may rest assured that they cannot really improve their condition by an alternative of a strike, even when supported by the accumulated funds of a friendly society. It is a delusion that because the masters accept the terms of the men for a rise in wages they are benefited thereby. Unless they gain an individuality in proportion to the rise in wages, they merely nourish a class of sharks, who extravagantly, and for their own interest, manipulate the funds of the "friendly societies" to which they belong. Hence "friendly societies" give but little equivalent for interest to the subscribers, who are well off if they get their bare capital back when they most need it. It is a fit subject for legislation to amend the rules and regulate the disposal of funds, which the absence of individuality amongst the working classes has aggregated in the hands of a few. These funds should be strictly applied for the benefit of the individuals who have contributed them, and not for the general purpose of supporting men on strike. Enactments do not at present prohibit such a perversion of funds, and insufficiently guard the ignorant subscriber (who perhaps can scarcely read the rules) from fraudulent *viva voce* representations. The savings of our industrious poor so melt away under this pernicious system as to call for increasing legislative restriction, unless economy in diet and co-operative use of the money saved thereby can be effected.

I will now give an extract from the autobiography of a vegetarian, as was related to me by the hero himself. He was born in the north of England in 1811, but although his hair was grey, he otherwise appeared better preserved by fifteen years than most persons of his age. His father was a minister of religion, and he was the eldest of twelve children. He was of ancient and distinguished lineage, but his father never having had more than £300 a year, he was obliged to send his children out early into the world, and so at fourteen he was put into a house of business in a great northern town. For the first three years he had nothing but his board with one of the senior clerks, but at the end of that time he got as much dry bread and water for his lunch as he could take, and 10*s.* a week to board and lodge himself. He accidentally obtained some works on vegetarianism, and was resolved to put in practice what he had read, as otherwise he found he could not support and clothe himself decently. I will now give his own words as nearly as I can recollect.

"I was seventeen then, five feet eight inches high, and strongly built. I had but 10*s.* a week for everything. How should I best lay it out? The senior clerk took me as a lodger for 1*s.* 6*d.* a week—one good room. There was a bedstead in it, but no bedding or other furniture. I was resolved to do what best I could, and owe no man anything. Some canvass coverings which my good mother had put round my packages served me to make a mattress when filled with hay. For the first eight weeks I slept in my oldest clothes on this mattress. My diet was ample and nourishing, but very cheap. Threepence a day was the cost. About one pound of beans, which did not cost more than 1*d.*, half a pound of bread daily, two halfpenny cabbages, three pounds of potatoes in the week, two pennyworth of rape-seed oil, one pound of twopenny rice, about a farthing's worth of tartar from the wine casks constituted my very nourishing diet. Thus 1*s.* 9*d.* for my food, and 1*s.* 6½*d.* for my fuel and light, left me 5*s.* 11½*d.* for other purposes. At the end of eight weeks I was in possession of above two pounds. It took me nearly this sum to purchase a straw palliasse, blankets, sheets, and pillows, second-hand. I persevered for another year on this diet, and found myself in possession of about twelve pounds. As I had some respectable acquaintances in the town, I resolved on spending this sum in furniture, in order that I might have a decent room in which to ask my visitors. Taking a lesson from the poet Goldsmith, I had a bed by night and a chest of drawers by day, so that my apartment, alternately my sitting-room and bedroom, was suitable for lady visitors. I resolved to marry as soon as I could furnish two more rooms, and had laid in a good stock of clothes. This being done, I found myself married, and very happy, but with 10*s.* a week only. We laid out our money as follows:—We paid 3*s.* 6*d.* for three rooms, 1*s.* for fuel and light, 3*s.* 6*d.* for food, and had 2*s.* for other contingencies. Our food consisted of bean stew three times a week, potato pie twice a week, puddings without eggs twice a week, carrots, turnips, or some green vegetable daily. Our breakfast was porridge, either of corn or oatmeal. We ate bread with it, thus ensuring mastication, and rendering butter, milk, tea, coffee, or cocoa unnecessary. We sometimes took tea in the evening, but oftener cold water. I was married in December, and in the following November my wife had a son. In a few days my salary was raised to 18*s.* a week. Before this my wife attended to all our wants. I now took an Irish servant girl, who was willing to be vegetarian. I was in possession at the end of my second year of married life of ten pounds sterling. I

invested in the purchase of tools in Birmingham and Sheffield, and sold them to the workmen employed by our firm, and repeating the speculation many times, found myself at the end of the year in possession of £150. Two years after, my savings had been brought up to £1,500. This continued to increase as time went on, so that when I retired from this branch of business I was possessed by savings and good-will of £30,000."

This the vegetarian still further increased to the handsome income of £18,000 he now possesses, and declared in the strongest terms his success to be due to the economy of the diet, and his capacity for protracted bodily and mental labour which it promoted.

I will now say a few words on the details of the economy of vegetarian diet.

In the introduction to the Vegetarian Cookery* the author gives a table of the relative cost of nutriment of certain articles of food, which, although somewhat different in price as to the valuations that have ruled for the last few years, yet form a fair basis for criticism. The author gives the following table :—

Articles of Diet.	Containing		Supplying flesh-forming principles.	Price per 100 lb.	Cost of supplying 100 lbs. of flesh to the body.
	Solid Matter.	Water.			
	Per cent.	Per cent.	Per cent.	£ s. d.	£ s. d.
Beans . . .	86·0	14·0	31·0	0 6 11¾	1 2 6
Peas	84·0	16·0	29·0	0 6 8	1 2 11¼
Lentils . . .	84·0	16·0	33·0	0 16 0¾	2 8 8
Wheat meal .	85·5	14·5	21·0	0 12 6	2 19 6½
Barley meal .	84·5	15·5	14·0	0 8 6¾	3 1 1¾
Oat meal . .	91·0	9·0	12·0	0 10 10	4 10 3¼
Butchers' meat.	36·0	63·4	21·5	2 10 0	11 12 6½

Since the date of the publication of this table, the vegetable substances enumerated have not altered much in price, but the butcher's meat has nearly doubled in price, so that it would now cost nearly £20 to supply to the body what in beans could be had for £1 2s. 6d. ; in peas for £1 2s. 11¼d. ; in lentils for £2 8s. 8d. ; in wheat meal for £2 19s. 6½d. ; in barley meal for £3 1s. 1¾d. ; in oat meal for £4 10s. 3¼d. Thus butcher's meat is from five to eighteen times as expensive an article of diet as the above staples from the vegetable kingdom. Hence every economist must acknowledge that a flesh diet in a population, or even a diet greatly composed of flesh, involves an enormous waste of the resources of a country. Flesh contains 36 per cent. of solid nutriment, and 64 parts of water, while such vegetable productions as grain and beans contain from 80 to 90 per cent. of solid nutriment.

If such is the case, and it may be taken to be clearly proved that such is generally the case, it is well worthy the attention of legislators and philanthropists and every man who wishes to do the best for himself, to consider the question of the vegetarian versus the flesh diet. Legislators—those who hold the purse-strings of a nation—should consider how far it is prudent to legislate on the subject of food, either by enactment or by the authorisation of an enquiry. For although the facts I have quoted are known to a few, yet they do not appear to be known to many, especially of the classes who manage the affairs of State.

It is certain that flesh and blood,

* "Vegetarian Cookery," by a Lady. 5th edition. Page 19.

nourished on a vegetable diet, are as substantial as any reared on a flesh diet. Why then give the importance to flesh as a nourisher when it is so much more costly than a vegetable diet? Surely if beans are the cheapest food as regards supplying the waste of the body, they should be a frequent article of food for the poor, both in their private homes and in those large establishments such as workhouses, gaols, hospitals, schools, both charity and other boarding schools; and in the great assemblies of men in our armies and navies. It would not be necessary to give any equivalent to the inmates of gaols, hospitals, and charity schools for an enforced vegetarian diet; but in the case of the army and navy it should be to a great extent voluntary, with an allowance in money in consideration of the economy of the vegetarian diet, with the object of encouraging thrift. I have used beans as a typical food, but the same rule and advantages might be allowed to induce the use of other cheap vegetable foods in our army and navy.

Were the vegetarian diet established in the army and navy, drunkenness would disappear by the vegetarian diet destroying the taste for alcoholic liquors, which I have shown to be the case in my vegetarian cure for intemperance. One of the great evils connected with the massing of large bodies of men is the want of self-restraint which the artificially imposed discipline induces. The vegetarian diet also is extremely conducive to general health, as well as the enemy to fevers and epidemic diseases, and favours greatly the recovery from all diseases, as well as the healing of wounds.

The attempt to live largely on meat ruins a poor man, at present prices he being better nourished as well as more economically fed on a farinaceous diet.

VITAL REFORMER.

THE HISTORY OF A PHILOSOPHER: HIS EARLY LIFE.

WHEN I was at school, the tutor and my master would have long arguments together, and once almost quarrelled over the meaning of some Hebrew roots. They repeated the words roots and points so often that I was much impressed, and watching an opportunity when my uncle was smiling, I said—

"I wish you'd explain to me what Hebrew roots and points are."

"Fetch me your mattock," said he, "and come into the garden."

I obeyed.

"Now," said he, "dig up that bed of Jerusalem artichokes."

It took me two hours to go over the ground, and I filled two bushel baskets with them.

"Well," said he, "these are 'Hebrew roots,' for they grow in Palestine, and those little eyes which spring from them are the 'points,' my boy. Take care you don't knock them off, or the roots won't sprout."

This he said with perfect gravity.

"And now, if you want to learn a little more, I will take you to a place where you can study the origin of many words in the English language. I mean the Latin roots."

So we walked on to a carrot and parsnip bed.

"Now," said he, "dig away at that; these are Latin roots, and those cabbages there are Saxon roots. But perhaps the Hebrew has been almost as much as you can manage to-day."

My uncle dwelt much on the excellence of his method of research. He aimed at making me a learned

pig. "Other animals," said he, "skim the surface of things, but a pig goes straight to the root. It is, therefore, the most philosophical of animals, and as such is often considered a bore, but it never minds, but continues to study the roots, and forms digests of them. The pig is an involuntary Baconian, but, unfortunately for his credit, it only appears posthumously, as there is, after all, some little difference between the philosopher and the pig, for one acts and studies according to Bacon, and the other unselfishly dies for bacon."

I was deeply affected by my uncle's sentiments, and after meditating on them for some days, I came to him with—

"Uncle, uncle, dear uncle, do you think I can possibly be a learned pig? I'm sure I'd do anything *but learn* to be one."

"I've strong hopes of it, my boy. You've made a good beginning, for your habits and manners are very piggish. You can never eat your dinner without having one paw in your plate, and when you eat soup, you make noise enough about it, and you know I had to give up having you in my bedroom on account of your snorting. You are a pig already, and therefore it is for your credit that you should be a learned one."

My second Christian name is Reuben. One day, feeling very tired, I went into the drawing-room, and lay down on my aunt's favourite velvet couch, putting my dirty shoes up in a very unceremonious manner, a great sin, as it was quite a forbidden thing for the boys to sit on, much less to lie on, any sofa.

My sleep was soon audible all over the house, and my aunt, who had the longest ears I ever knew, got up from her seat in the verandah and, guessing the cause, took down my uncle's birch, and soon roused me by a sharp whack.

"Reuben, Reuben!" said she, "you will never come to any good. 'Unstable as water, thou shalt not excel.'"

On this I stopped her, and ran out of the room, for I felt the latter part of Jacob's rebuke was even more applicable to me than the first.

The language and literature of Greece were frequent subjects of conversation at table. It was a long time before I could understand what they were. I expressed a great admiration for Greece, in the hearing of my master one day. Cow's grease or butter was the best, lard wasn't bad with bread and treacle, goose grease was nice for chilblains, but ancient grease was abominable. My master clapped his hands, and said—

"My boy, what you have said today has given me the greatest pleasure. I am proud of my pupil. I have no doubt you will realise your father's good opinion of you, and become, in due time, an eminent classical scholar."

So the very next day I had my first lesson in the Latin grammar, and was put into the fourth class.

Oh, how my head ached. I sobbed over my book. "I can't learn my task," muttered I, "and I don't see the good of it. Digging Hebrew and Latin roots for dinner appears worth while, but Latin books should all be burnt." But it was no use, for the Latin grammar was caned into me for two years, when I was sent home, and rated as a scholar. But one thing was clear; I was more sick of my class than classic.

As it was the quarterly examination of our Sunday school, I was desired to catechise the pupils, beginning with the adult class first. As I was most familiar with Zedekiah Blackwood, our negro gardener, I thought I'd take him to task first.

"Will you tell me, Zedekiah, what you do know and what you don't know?"

"Yes, massa. I know I am getting an old man. I'm getting bald—

black-balled, massa, and I don't know how long I'm going to live."

"Can you tell me where you're going when you die?"

"Me suppose me go up a tap, massa," he said, with a grin.

"Where?" said I.

"Up a tap, massa."

I let the "image in ebony" pass.

I had been at home about a year when my father apprenticed me to a surgeon called Doctor Globule. He was one of the earliest homœopathic practitioners in the colony, and was much laughed at on his first arrival from Germany. He made his medicines in a cheap and novel manner. A brook ran through his grounds; he would take an ounce of white arsenic, and put it into the pool from which the brook rose; a few yards down the water which flowed from it was bottled as the "mother tincture of arsenic." Lower down still was the "first potency," and so on until the brook flowed out of his grounds, where they got the "highest dilution." What was medicine for man turned out to be poison for fish; so all the fine trout which his predecessors had fostered with much care perished.

Having married shortly after he became an ardent convert to homœopathy, all his children received homœopathic names, and they were all certainly homœopathically *small*. Belladonna the eldest, had great black eyes, which were as fatal to mankind as the berries of the plant. Pulsatilla was rather milder, but still, I was told, she had poisoned the existence of a young man. Dulcamara, the third daughter, was at once sweet and bitter, and therefore you may guess she had a curious temper. But none of the daughters of the good physician ever married. He would say they were "matchless," and so they proved. Bryonia was one of my favourites. She had a good many of the qualities of the plant, for she nursed me well through a feverish cold. She was of a whitish complexion and rather pretty and clinging; so in after life I often remembered Bryonia alba, and if the girl was not at hand, I took the drug. But before my term of apprenticeship was out, Doctor Globule died, in an odour of sanctity perhaps, as his youngest daughter, born after his death, was christened "Effluvia."

The Doctor when I first went to him kept a little one-horse carriage, which the neighbours called "his pill-box." When he got a little up in the world, he changed it for a two-horse dark hearse-like omnibus, which I soon christened "a black draught." On the doctor's grounds there was a spring, which was said to yield mineral waters. Persons came from all parts for the privilege of drinking: for my part I hadn't much belief in mineral water. Water was best pure, unless it had tea, gin, or brandy in it. I often asked myself what mineral water meant. Beef tea was *animal* water, cabbage water was *vegetable* water, and brine was *mineral* water.

When I was at the doctor's most of my time was given to pounding and running errands. I thought homœopathy no science—in fact, nonsense. Such being my views, my father thought it was absurd to make me a homœopathic physician, and resolved to devote me to commerce. I was fond enough of money, but didn't like the idea of being a clerk. I thought my best plan would be to look out for a wealthy heiress who had plenty to keep me on the liberal scale of diet I had been accustomed to, without the hard and stern necessity of following a vile trade. I had thus an inclination for the matrimonial business, if lucrative, although I should not have liked to have fallen in with a Mrs. Adam Smith; in fact, I had a horror of widows, considering them stale or at least second-hand. I made a little song, in which I freely expressed my views

on matrimony, and sang the praises of pretty virgins and the reverse of widows, whom I thought artful. I was singing this as I sat behind the green hedge in front of our house, when a widow's cap, enclosing a pretty face, bobbed over the hedge, saying, "I am sure I'm not artful, although a widow." And she laughed.

"I'm sure you are," said I.

"No, I'm not." And she bobbed over the hedge again.

I sprang through it, and there was Madame Sulphurous, the attorney's young widow.

"Well, my friend, how came you to think so ill of widows?"

"Experience, ma'am."

We got into an argument, and as it was very hot, and there were no neighbours near, I asked her in to rest and have a glass of home-made wine. She refused at first, as we were not acquainted, although we had long known each other by sight. But at last I brought out a decanter and some biscuits.

"Now, madam, you must take a glass or you'll faint on the way home this hot day."

I called for my sister Sarah, and she brought the widow in, and very glad she was to rest. She fairly floored me in argument, persisting that widows were the sweetest and most artless and unfortunate of the sex.

"Come and comfort me sometimes," said she; and she extended her hand.

"Is this an offer?" said I.

"Yes, if you like to take it;" and she burst into a laugh.

"Then I'll vote a plumper for Madame Sulphurous."

I could hardly keep out of the widow's house after that, and finding that she had £400 a year and only a small shadow of an incumbrance in a very little sickly boy, I was as good as my word, and before three months were over I was engaged to her. I was sixteen and she nineteen. Shortly after we were engaged, I read my Lavinia a little lecture on the theory and practice of osculation, illustrated by experiments. "I am going to lend you a kiss, my love."

"How shabby of you," said Lavinia; "won't you give me one?"

"No, I won't; for what's lent ought to be returned, but what's given never comes back. I've paid my addresses to you, my love."

"Yes," said she.

"Then give me a receipt."

"I have given you one—a favourable answer, if that's what you mean."

"No, I want a stamp receipt."

"Very well;" and she kissed me once.

"That won't do, that's only a penny stamp, and I want a sixpenny one."

"I'm sorry I haven't one to give you, for I have only penny stamps left."

"Then stick on six penny ones."

I've heard of people leaping for joy, but when I got these I did more, I stamped, singing—

Lavina's found a lover now,
Pop goes the question;
The willow's withered on her brow,
Pop goes the question.
Her eyes are dry, I'm glad to see,
Pop goes the question;
She's found a comforter in me,
Pop goes the question.
Her babe has found a daddy dear,
Pop goes the question;
She'll forget her sorrows here,
Pop goes the question.
We will live in jollity,
Pop goes the question;
And spend our lives so merrily,
Pop goes the question.

But Lavinia was a very proper person, and kept the gentlemen in general at a very great distance. Shortly before we were married, I introduced her to my uncle, who in trying to kiss her was met by a box on the ear.

"How shameful of you, Lavy-love-davy! Is it not right to give 'a kiss for a blow?'"

"To be sure it is," said she.

"Then it must be very wicked to give a blow for a kiss, unless it is in church, when the blow of a kiss may be excusable." And he turned and looked slyly at me. Lavinia did her duty after that.

I thought what my old master the homœopathic doctor would have said; for whatever faith he had in his drugs and systems, he had none whatever in kissing. He would have floored me at once with SILLY SYLLABUS CURANTUR; which, however, would not have been a perfect cure for our inflamed lips.

As father still insisted on my turning my attention to business, I proposed immediate marriage to the widow, as the best way of escaping from paternal government without an open revolt. So I was wived before I was seventeen—as a mere infant, which my second-hand bride also was. We were as happy as possible, and she rather encouraged than otherwise my love of fun. My father was a Quaker, but on my marriage I renounced the sect, as I thought them a "yea-nay" sort of people; they are not liked by general society, nor by military society either.

My wife was much celebrated for her beauty, and among other perfections, for one of the finest celestial noses the world ever saw. Impertinent people call this a turn-up nose, and if there is any truth in the doctrine of development, I think my wife's nose proved it; for from her earliest infancy she was famed for turning-up her nose at people, as were her mother and other female ancestors before her, for many generations. This habit is especially indicative of elevation of mind; of a disposition to despise the earth—earthy, and of a tendency to make the most of pure air. But these sniffs, although admirable, were not of much practical utility, which to my mundane mind and rat-like poking nose is the chief thing; so I pondered the matter awhile, and at last I hit on a plan of turning my dear Lavinia's gift to a useful purpose. In my rambles I noticed an old-fashioned iron knocker, the handle cleverly adapted to an iron mask of the human face; but the execution was so coarse that I could hardly admire it. These blacksmiths had surely never seen my lovely wife; but to my ingenious mind it was enough. Lavinia had often threatened to have a cast of her face taken, to compare with that of the Venus de Medicis. I now reminded her of her intention. And so her celestial nose was soon run in plaster, moulded in clay, and modelled in lead. A more beautiful leaden countenance was never seen. I had it mounted on a board, and it made a most admirable hat-peg. Fine and useful arts were thus combined, and I was more than satisfied. What a treasure a model wife is, even if she serves the humble office of a model for a hat-peg. What can we have more? for we can hang on to such a one.

I contributed an article to the *Mechanic's Magazine* on the use of the nose, which was most cleverly illustrated by cuts. In the first figure I was represented in the character of a boy playing a game of giant strides; the loop which supported me having found a safe lodgment on a celestial nose. In the second cut an ingenious framework was suspended from the celestial nose with knobs or strings for the support of hats, umbrellas, cloaks, hatchets, swords, brushes, and a score more of indispensable articles. On exhibiting a model electrotype from the plaster-cast I had originally made, with all these appliances, in the Industrial Exhibition of the State of New York, I received a silver medal, which I handed over to my dear wife, as she and she alone was entitled to receive it.

What with American and Australian emigration, there ain't much left but dregs in the old countries;

still, a little gold-dust may be sifted out of them, and we Yankees, having a notion of profit, must go where we can get it. An Englishman overheard me talking thus.

"Dregs, do you call us? Why, that's the most solid part of the nation, the very bottom, the foundation, the only part that contains any gold. As for the top part, the Yankee scum, it's all froth, gas, and bunkum; so hold your tongue."

"I shall judge for myself," I said.

And so we set off for our serio-comic European tour, resolved to be as merry as possible.

We had many controversies on board ship with the passengers on various subjects. And a great variety of extraordinary opinions were expressed. One schoolmaster of rather narrow capacity held that Cowper was the only poet—he meant Olney poet. There was a great maltster from New York on board, who argued against this schoolmaster's tea and water total opinions. For his part he had "*no brew*" of the "Maine Liquor Law Alliance." There was a Pennsylvanian iron-founder too, who described in glowing terms his whole furnace operations; they were grander than anything else in nature or art. "Fire," he said, "is the noblest of man's servants; sublimed things are the most sublime."

Our heads were all full of the new Mexican revolution, and partizan warfare on board was warmly maintained; from words we might have come to blows, and ended, perhaps, as we sat over our wine after dinner, in demolishing the glasses and the dessert. There was a moment's lull like that before a storm, which was broken by an ass-faced clergyman, who used to gobble the blessing before dinner for us, so irreverently that I considered it a *dis*-grace. Well, this ass brayed out,—

"For my part, gentlemen, I don't see the wisdom of quarrelling over other people's affairs. I am always grieved to hear in the nineteenth century of an insurrection; my soul revolts against it."

"Parson Asinus," said I, "I think you are right, and all who agree with me will do as I do."

I brayed.

Nobody else did; so I continued to bray. At last Parson Asinus broke silence.

"Though thou shouldest bray a fool in a mortar with a pestle, yet would not his foolishness depart from him."

"I think you are right, Mr. Parson; and now let us all apply this true proverb to ourselves. We are all more or less fools. Those are the greatest who were going to quarrel. Parson Asinus is the next." Here he drew a tremendous long face, and looked more like a donkey than ever. "And I am the least—or at any rate the youngest."

The whole cabin now shook with the laughter of those who had been ready to take up the cudgels, and so the threatened revolt was suppressed.

Parson Asinus viewed me, I was rather surprised to see, with rather more favour from that day. We would have frequent conversations on natural history and the classic authors.

"The best English Latin scholars," said I, "hold that *capram* is a she-goat."

"Quite right," said the parson.

"But how can a she-goat ever be a ram? It would not become so because it had been at the 'Cape.'"

Parson Asinus was fond of legendary lore, antiquities, and coins. "Many legends," said he, "are, after all, only founded on fact, and they of course are not so interesting and valuable as they might otherwise be; but those on coins are the most precious of all, because they are true."

"Not always," said I. "The other day I got a piece of pewter stamped one dollar, and it isn't

worth a tobacco-stopper; so the legends on coin are not always true."

As winter was the season of our voyage, it was very cold, and the snow fell and froze on our deck and rigging. Both sailors and passengers went about blaspheming the weather. Our parson vented his spleen in Latin.

"Snow" was "nix nivis;" this particular snow, having laid long on the deck, was "Old Nick's."

We had several eminent travellers on board, some of whom had been in Caucasia, and talked a great deal about Schamyl Bey.

"Schamyl Bay," said an old lady at the table; "that's another name for the Gulf of Constantinople, isn't it?"

This same old lady had been at Port-au-Prince, St. Domingo. It was the most horrible place to live in possible; it was rightly named Hate-ye or Hayti. She was never so uncomfortable in her life as when she was there, amongst the rampant blacks. This lady was a great musician, and gave us Haydn and Handel on many occasions. She was very fond of Handel's "water-piece," but the younger lady-musicians always tried to throw cold water on it.

"You speak very well; quite like a barrister. Was your father ever called to the bar?" said my old lady friend.

"No, madam; but as grandfather kept a publichouse, my mother often was. Poor man, in his latter days he fell into great poverty and had to solicit alms; he became, in fact, a solicitor, without serving his thirty-nine articles to one, and carried about a cerulean blue bag to gather bones."

"Law, law! dear me! law! law, sir."

(*To be continued.*)

SOPHY: AN EXAMPLE TO THE LADIES OF BAYSWATER.

A WIDOW lady and her step-daughter, distinguished as much for their aristocratic connections as for their intellectual and moral gifts, lately resided in Bayswater.

Early in the summer the lady's sister died after a lingering illness, which had been soothed by the attention of Sophy, who, although the daughter of a Lieutenant-Colonel in the British army, acted as maid to the step-daughter. The history of Sophy is so remarkable that I think, having her consent, it is worthy of being recorded.

The Colonel was the son of a wealthy Jew tradesman of the West-end, who, after educating his son with unusual care, permitted him to enter the army with an allowance of £500 a year. He was much respected in his regiment.

After many years' service in various climes, a remarkably impressive sermon was the means of developing in him a most earnest Christianity, which, on announcing by letter to his father, caused his parent great grief, and as the father expressed it, "a broken heart," for he had aimed at concentrating on his son the larger part of his wealth. As a means of possibly inducing the son to renounce Christianity, the allowance of £500 a year was stopped. The son, however, was not shaken in his faith, and still further displeased his father by marrying a penniless Christian girl, the daughter of a retired officer.

During the Crimean War the Colonel, then a major, was ordered to that peninsula, and brought his wife and his daughter, then very young,

and his wife's sister, to London. He died during the siege of Sebastopol. His widow and her sister were total strangers in London, and were utterly ignorant of business.

For some years the widow had been weak in mind, and shortly after her husband's death became quite imbecile, so that she was unable to take steps to obtain the pensions which she might have got had she possessed ordinary intelligence.

After lingering in this state for about two years, she died, leaving her little daughter to the charge of her sister, who was a very unenergetic and unwise person, with an income of £1 per week. She lived in one room at the East-end of London, and sent her niece to a national school, where she remained until she was fourteen, when a fall downstairs crippled the aunt, and Sophy was taken from school to nurse her.

After some months of great suffering she died.

Accompanied by the district clergyman, the step-mother, of whom I have been speaking, visited the dying woman, and became interested in the girl, then fourteen, who was singularly beautiful and intelligent. She soothed the aunt's last hours by promising to take charge of the girl, and bring her up to some useful employment. On the death of the aunt, the girl was accordingly removed to the lady's house in Bayswater, who gave me the following account of her *protégée*:—

"At fourteen she was a tall, well-formed girl, and very strong. I was fearful of bringing her up in those semi-ladylike habits which are the curse of the middle class. I had before me numerous examples of young ladies by birth, who, although without fortune, had been brought up to no regular employment, and who passed years of their lives in struggling to get something to do. The majority of these ladies are not worth their keep, as they are weak, lazy, and too conceited to learn; therefore, in despair, many of them take to immoral courses. I was determined that Sophy should not follow these bad examples, but that she should be brought up to be useful. I had at that time a lady's-maid above fifty, who had been with me since my marriage, and to whose care I especially consigned Sophy. The maid was, for her class, a very well educated and judicious person, and Sophy was instructed in all the ordinary duties of a lady's-maid, in the making and repairing of dresses, in hairdressing and in various kinds of fancy work. Thinking that she might be at some future time a poor man's wife, I instructed her in the cutting out of the male clothing that was sold at our poor people's clothing club. But Sophy was remarkably zealous in her intellectual occupations. When she first came to me she knew nothing but reading, writing, and the ordinary rules of arithmetic. She had not been with me more than two months, when she told me she wished to spend her wages in getting lessons in French in her leisure time in the evening; so I determined to give her as good an education as could be had at evening classes. I allowed her to attend classes from six till ten at night for five years, paying the fees myself, at at average cost of £30 per annum. Sophy passed successfully the Cambridge middle-class senior examination, and obtained first-class certificates for several subjects. After her education was in this way finished, I took her to the Continent, where we spent three years in travelling, with the exception of about six weeks passed in London, in the height of each season. Sophy in this way learnt to speak French and German well, and a little Italian. She is most active in mind and body. She gets up at four in the morning in summer, and six in the winter, and sel-

dom retires before twelve. In consideration of the devoted attention Sophy paid my sister in her last illness, she left her all her wardrobe, some of her less valuable jewels, and a legacy of £50 in money. She promised her a piano on her death-bed, for Sophy is well skilled in music, but not leaving it to her by will, the piano was sold with the rest of her furniture. My daughter —that Sophy should not be disappointed—bought her a small Broadwood pianette, which she keeps in her bedroom and practices some hours daily. Sophy is as beautiful a character as I know; she would grace any position in life, but Providence has placed her in a humble one at present. She is contented apparently with me. Her clothing costs her almost nothing, and the thirty guineas a year my daughter gives her is mostly saved."

In the month of August, after I heard this narrative, I attended a meeting of the British Association, where I made the acquaintance of a gentleman, the curator of a country museum, who was grieving over the expected loss of his daughter by marriage.

He described his daughter as a beautiful, amiable, and energetic girl, who after devoting her early mornings to housekeeping, was ready from ten till four to assist her father in the labelling and arrangement of the extensive natural history museum under his charge. He was prepared, he said, to give fifty pounds a year to a young lady who would take his daughter's place, as her mother was such an invalid that she could do nothing either to help herself or him. He occupied a very good position in society, as his wife belonged to one of the oldest and most wealthy of the families in the county, and he kept a pony carriage, which was at the service of his daughter or her substitute after the work of the day was concluded. The gentleman pressed me very much to find him, if possible, a second daughter, who would be useful in the museum.

Shortly after I returned from the west I called on the lady and her step-daughter, in Bayswater. The daughter consulted me about her health, which now caused her great anxiety, as she was suffering from a complaint identical with the leprosy described in the Bible. It was painful to see a beautiful and accomplished girl a mere wreck, shunning the society of her most intimate friends. I advised her to entirely abandon the pork, bacon, and salt fish which formed her chief food, as this was probably the cause of her disease, and adopt a diet of bread and fruit. This she promised to do, and two physicians of the highest eminence said the fruit and bread diet could do her no harm, but might be beneficial. I grieve to say that a physician, under whose charge she was placed in the country, has encouraged her to return to her favourite diet of pork and salt fish, with the result to be expected, a growing virulence of her complaint. Both the mistress and the maid felt great dread whenever they came in contact with the suffering lady, as they deemed the complaint infectious. The maid particularly was quite upset, and felt that she must have some change, as it was on her that principally devolved the attendance. The young lady felt that her prospects were blighted by this visitation, which came upon her almost as suddenly as a pestiferous growth on some highly favoured plant. The morning saw her lovely and attractive, beloved by all; the evening saw her loathsome, shunned by those who had most loved her society.

On the occasion of my last seeing the young lady, Sophy watched for my departure in the hall, and asking me to come into the dining-room, she, in grief, begged me to help her to some situation, as she felt that her mind would give way in dread of taking this awful disease.

About a fortnight after, the curator of the museum arrived in town, and I thought that Sophy might possibly be helpful to him, in place of his daughter; so, with this object, I took him to call on her mistress. "As you," said he, addressing the maid, "can do French and German translation, and are so clever at mechanical pursuits, I will give you seventy pounds a year, and will recommend you to the trustees for the post of assistant-curator to the museum, which, if you are successful, will bring in fifty pounds a year more. But, in order to obtain this, I advise you to get as many testimonials as you can from the most distinguished people that you have come in contact with, for these will weigh greatly in the minds of our trustees."

Before parting with Sophy, she assured me that for the preceding three nights she could get scarcely any sleep, from intense anxiety. She was almost constantly praying to be delivered from her painful situation. Towards the morning of the last night she fell into a sleep, in which she saw in a dream an angel come to deliver her from this house of pain. In delight she awoke, and starting out of bed dressed herself with a cheerfulness that she had not known for weeks. Whenever she heard the knock at the door, which announced the coming of the curator and myself, she was convinced, before she was aware who it was, that the hour of her deliverance was come.

Taking the curator's advice, Sophy indited letters to about thirty persons of distinction, who visited at the house, and knew her history. She recalled to their minds some little incident in which she had come in contact with them personally during the visits she had paid with her young mistress to their country-seats. She got nine favourable replies, in five cases accompanied by presents of money, making a total of thirty pounds. On seeing these testimonials, I thought I might be of still further service to her, for I was informed that her grandfather, the Jew, was dead, and that he had left two sons and a daughter, who were all married, but had no children, and were, moreover, all wealthy. I thought I would, with the testimonials in my hand, seek an interview with the relatives, and ask them if they would like to see their niece, although they had, fourteen years before, refused to have anything to do with her.

I found the wife of the elder uncle at home, a most warm-hearted Jewish lady, who said they now all regretted not having seen their niece in her childhood. She recounted their wealth, about a quarter of a million sterling, and said they had no relatives to inherit it but Sophy. She appointed the evening of the next day to see Sophy. Accordingly the whole family assembled, uncles, their wives, the aunt and her husband, and cordially embracing her forthwith all invited her to stay with them by turns. Her younger uncle issued a hundred invitations to a grand party, to be given in honour of the newly-discovered niece. The elder uncle presented her with valuable jewellery and furs; his wife with a dress-piece elaborately embroidered for a lady of the Court of George III., but never made up. This was to be worn on the occasion of the ball; so it was sent to a first-class dressmaker at the West-end, to be made, and was on view in the window for two days, where I saw it. At the ball were many distinguished Hebrews, and among them a gentleman who had risen from the position of humble degree to that of a treble millionaire. He was most delighted with his friend's niece, and started a subscription to endow her with a fortune, putting his name down for £1,000. Her two uncles. her aunt, and her husband subscribed £19,000, so that she had a

fortune of £20,000. The illness of the step-daughter necessitating a separate establishment, the friends of the step-mother feared that she would not have the means of living in the style to which she had been accustomed, and so one of the most considerate proposed a testimonial to her, in the form of a gift of a house in an aristocratic neighbourhood, where they might have the benefit of her counsel, which was held to be almost oracular by a large circle; and so, much to the credit of her friends, this project was successful, and a lease, costing nearly £5,000, was purchased and presented to her. Sophy's elder uncle, inspired by gratitude for the inestimable service she had done his niece in the superior education given, presented her with antique furniture and articles of vertu, sufficient to fill her house, at the cost of over £2,000. The poor afflicted young mistress sent Sophy a cheque for £100 as a parting gift, and said she feared she would not long survive, as her spirit was broken by the isolated life she was obliged to lead. She recounted Sophy's many services and good qualities, and said she had made her will, by which she divided her property between her step-mother and Sophy, and wished that, on her death, her step-mother should consider Sophy as an adopted daughter, as a reward of the diligence she had shown and her single-minded devotion to her studies, as well as to the duties of her station, as long as she resided with her.

The *dénoûment* of this wonderful and romantic history has, in great part, occurred within the last five months, and came at the close of 1877 as a reward for a year of toil to the humble instrument used in benefiting this interesting young heroine, who, I am thankful to say, has sent a very efficient young lady friend in her place as sub-curator in the museum.

CRIMES OF IMPERIAL RUSSIA.

THE treatment of the Strelitzes by Peter the Great is among the most horrible of incidents recorded in any history.

They were a band of Slavonian soldiers, constituting the Emperor's special guard. They were discontented with his policy, and determined to oppose him; therefore, unless successful in their plot, they could not have expected anything but the severest treatment. They planned to set the city on fire, and believing that this catastrophe would bring the Emperor to the spot, they trusted, in the confusion and crowd which would naturally assemble, to have the opportunity of assassinating him. "But two of the conspirators lost their boldness, and revealed the plot to Peter. He went unaccompanied to a banquet where the criminals were just about to assemble. In this situation he did not lose his presence of mind, but he confounded the conspirators, who, whilst hesitating if they should kill him, were disarmed by his guard, who had followed him. His vengeance was terrible; the punishment was more ferocious than the crime. First the rack, then the successive mutilation of each member, then death, when not enough of blood and life was left to allow of the sense of suffering." To close the whole, the heads were exposed on the summit of a column, the members being symmetrically arranged around them as ornaments, a scene worthy a government of masters and of slaves, reciprocally brutifying

each other and whose only god was fear.

In Turkey even, before the reform, such vengeance would have been called barbarous. This was the first insurrection of the Strelitzes. Seventeen months after, another came. The combat was a brief one. Gordon, a Scotchman, with 1,200 disciplined men, speedily vanquished, disarmed, and fettered the rebels. Peter, who was at Vienna, hurried back. Just returned from civilised countries, he relapsed into all the ferocity of the savage manners which he wanted to reform, and which he now displayed by torturing and rending with his own hands 2,000 of these wretched malcontents. Enormous as were their crimes, they cannot justify the atrociousness of so many executions, nor can it find any excuse in the strong influence of the manners and customs of that period, or in the necessity of the circumstances and of the severe measures which it was indispensable to adopt with brutal and ferocious slaves. Peter interrogated the prisoners by torture; then, in imitation of Ivan the Tyrant, he constituted himself their judge and executioner. The nobles who remained faithful he compelled to cut off the heads of the guilty nobles, whom they had just condemned. "Seated on his throne, he witnessed the executions; he went still further; with the festivity of banquets he blended the horror of these punishments. Intoxicated with wine and with blood, the glass in one hand, the axe in the other, in a single hour twenty libations marked the fall of twenty heads, which he smote off at his feet, exulting in the horrible skill which he displayed." In the following year fresh insurrections broke out, and eighty Strelitzes were beheaded by the Czar's hand.

Alexis, the son of Peter, was a stumblingblock in his father's plans of reformation. He was stupid and brutal in disposition, and drunken in his habits. "He was perpetually surrounded by ignorant priests, to whom he promised a removal of all the beneficial reforms and civilisation instituted by Peter, and a restoration of the old barbarous customs. To effect this, St. Petersburg and the navy were to be destroyed, and the special friends of Peter were to be put to death. His father having become aware of these plots, sought to arrest his son, but he escaped into Italy. Peter discovered his retreat, and wrote to him." He said, "I assure and promise you by the name of God and of the last judgment, that if you submit to my will and return hither I will not inflict any punishment on you, and will even love you better than ever." Alexis returned, and was immediately disarmed, excluded from the throne with his posterity, and threatened with a curse if he should appeal against this sentence. He was confined in a fortress for five months, where he was tortured with every fear that heaven and earth can inspire. He was compelled to impeach his own mother, friends, and relatives, and to accuse himself as a man unworthy to live; and all this under threat of death. By a mixture of deceit and cruel threatening, Peter induced his grandees and state counsellors to condemn his miserable son to death. The father chose to be the executioner of his son. The day after his condemnation he went to inform his son of the sentence, and take leave of him. When the Czar was supposed by the bystanders to be melted to pity, at that instant he sent for the potion he had ordered to be prepared, and under pretence of giving him medicine, administered a fatal draught to his son, who, in a few hours, expired in convulsions. Peter deceitfully ascribed his death to terror of the sentence which had been pronounced upon him. He enjoined silence on this painful sub-

ject, and it was only through a foreigner, who was partly concerned in the dismal tragedy, that the world has become aware of the doleful fate of the unhappy prince.

Paul III. was a weak and foolish sovereign, and was savagely murdered by some conspiring courtiers. As he lay in state, a very thick cravat concealed the fact that he was strangled. His successor was Catherine II., a sovereign of great ability, but conspicuous for licentiousness. In her reign occurred the partition of Poland, and the conquest of the Crimea, Azoff, and all the country between the Dnieper, the Boug, or Bug, the Dniester, and the Black Sea. If Catherine did not order her husband's murder, she at least rewarded his murderers.

In 1763 Augustus III., king of Poland, died, and Catherine, by bribery and threats, contrived to procure the election of Poniatowsky, her favourite, who took the title of Stanislaus Augustus. This led to the interference of the queen in the affairs of Poland.

The events which led to the partition of Poland were of a mixed religious and political character. The Roman Catholics being the most numerous, wished to override the Protestants, members of the Greek Church, and other religionists. These sought the help of Peter the Great to establish their right of toleration. By his influence they obtained some redress, but after his death the Polish Dissidents, or dissenters, were again deprived of their civil and religious liberty. In 1764 Russia, Prussia, England, and Denmark remonstrated with the Polish Diet to obtain justice for them, but without effect. This led to civil war, in which Russia interfered and intimidated the Catholics, so that redress was obtained for the Dissenters. These continuing to seek assistance and support from Russia, their opponents sought help from Turkey, and this brought on a war between Turkey and Russia. Poland was ravaged by war and pestilence, and the result was an alienation of about one-third of her provinces, which were taken possession of by Russia, Austria, and Prussia. Russia gained a great part of Lithuania and Livonia. The Russians having defeated the Turks, obtained Azoff and Taganrog, and in 1785 the Crimea. In 1787 Catherine visited her new acquisitions, and Joseph II. of Austria accompanied her to the Crimea, where they arranged to attack Turkey conjointly. Soon after, the Turks and Swedes declared war against Russia. This did not check the advance of Russia, as the Turks were everywhere defeated. But the Poles, taking advantage of Russia being at war with other countries, shook off, for the time, her influence. In 1791 a new constitution was formed, and the monarchy made hereditary, but these measures did not bring peace or solidity to the country. The nobles were discontented, and Catherine of Russia, joined by Prussia, interfered, and the result was a further spoliation of Poland by these countries. Russia now had the whole of Lithuania, Podolia, and Volhynia ; and Prussia, Posen, Gnesen, and the towns of Dantzic and Thorn.

In 1794 an insurrection broke out at Warsaw; the Russian garrison was nearly destroyed. The Poles, under Kosciusko, made a desperate resistance to Russia, but they were eventually entirely defeated, the king of Poland abdicated, and the final partition of the country took place in 1795.

Austria had Galicia, Prussia took Warsaw, and Russia the remainder.

(*To be continued.*)

THE SUFFERINGS OF A POLISH NOBLEMAN IN SIBERIA, AS RELATED BY HIMSELF.

DEAR SIR,—As you wish to have an account of my experience of Siberia, I tell you that I was the son of a Polish count, and am now forty-seven years of age. I was educated at Prague and Vienna for the Diplomatic Service. I know eight Slavonic languages, as well as German, French, and English; but my passion is geology. When my education was completed I removed to our country-house, but life there was too dull for me; I wanted more society than huntsmen and fishermen. I begged of my father to let me reside in Warsaw, and to give me an allowance. This he did, and it was liberal; he could afford it, having about £14,000 a year. The life I had led convinced me of the rights of man, and gave me a hatred for tyranny. My German tutor was a most worthy man and very accomplished. He had foreign correspondents, and newspapers came to him, and letters, reflecting on the condition of Poland. At last these letters and papers were seized as they came through the post, and my poor tutor was suddenly arrested. For three months he was confined in a fortress, when he was informed that he was sentenced to five years' penal servitude in the mines of Siberia. His wife came to us with the dismal news. She was not even allowed to bid him goodbye, but on the day he departed, being *enceinte*, she dropped down in a swoon, and almost immediately died. The doctor said her heart was broken. This produced a profound impression on me. My tutor—my instructor—the good and amiable, pious, almost saintly, to meet with a fate like this! He had two little children—girls. I said I would adopt them and educate them. My father gave me the money; they are now governesses in Paris. I was so weighed down by grief that I could not pursue my scientific studies for a month. I felt I would give everything I had, and life itself, to deliver my country from this infernal tyranny. When I was in this frame of mind, a young companion brought me a French novel, in which a young Pole was made to scheme for the delivery of his country. I embraced this young friend, and we two vowed to do what the imaginary Polish hero did—try to make his country free. We joined a society, which aimed to prepare our country for freedom, by cultivating an individual, noble, and independent spirit in her sons. It was not a revolutionary society so much as a moral society; but it was secret, and had its code of signs and watchwords. We had our representatives or correspondents in London, Paris, and New York. Our society had never encouraged any revolt. At last a ukase was issued proscribing us. My friend was arrested, and a letter was found on his person from me. This led to my arrest. It was sudden; when I was returning home from a party. My friends did not know what was become of me. After being imprisoned for two years in Poland, I was sent in chains to Siberia. My grandmother, who had brought me up, lost her reason, in grief for my mysterious disappearance, and my father's hair turned gray; my sister was never known to laugh afterwards, for I was the eldest and favourite child, the heir to the title and estates, and a descendant of one of the kings of the country. The journey was very long and painful. I walked all the way, and after many weary months' tramping, we arrived in the mining district. I was conveyed down an immense depth in

the mine; a shovel and pick-axe were placed in my hands, and I was told to remove a certain portion of rock. Unless I did this I should get no food. It was a quicksilver mine; one in which impure vermilion, and vermilion saturated with globules of quicksilver, were found. My hours of labour were fourteen; my food was black bread. By dint of concentrating all my energies on my task, I was able to satisfy the foreman of the works. Thinking I might have use for it, I secreted small quantities of native silver which occurred in a vein associated with the sulphuret, until I had gathered about eight pounds' weight of this substance. For this consideration, the foreman gave me materials for writing a letter, and afterwards conveyed it to the post; it was to my father, and contained the first intimation that he had received since my incarceration. I was then but twenty-six years of age, and although I was originally very strong, yet the horrible life I was leading in a place gloomy and wretched as hell itself was shortening my days. Before I had been there six months, my beautiful auburn locks were as white as possible, when they were not smothered in the dirt of the mine. In another six months every hair on my body was gone, and I showed symptoms of salivation. There was no escape from the mine; the prisoners worked on there hopelessly entombed till they died. Five years was considered a long life there; some did not live more than two years. It was my duty during fourteen hours to work with pick and shovel, at the extraction of the ore, and then carry it in baskets up long ladders to a platform, where it was broken into small fragments, sorted and sifted by women, who lived the same painful life as the men. After my day's work was over, having no books to read, I was glad to take myself to my bed almost as soon as I had finished my evening meal. My bed was hewn in a rock; it resembled a sepulchre. I had no bedclothes; I lay down in my working clothes, saturated as they were with the quicksilver. No changes of clothing were allowed. In this way I spent about three years and a half. I often wished myself dead, but a faint hope of escape prevented me from committing suicide. Some of my companions died from the dreadful sores they got from the quicksilver touching their skin, torn as it was with sharp rocks in the mine. Thinking that I might have an opportunity of presenting it to some one who might influence my release, I made a collection of the minerals which were found in the mine; these I kept under my bed. At last, one Sunday, I felt more than ordinarily ill, and was lying in my dismal hole reflecting on the happy days of my youth, and the apparent impossibility of escape from my wretched condition, when I heard the tramp of men, and was pulled out of my bed. Sunday was no holiday in the mines, but my illness was my excuse this day for rest. I was put in a truck, and was hauled up to the air, together with the minerals that I had collected. For about six months I was scarcely able to move with rheumatism and neuralgia; I was all this time in the house of a convict, a man of good rank and high scientific attainments, who, for the same reason as myself, had been banished. But in consideration of his knowledge of mineralogy and geology, being useful in the mine, he was made a sort of scientific referee, and a salary of two kopecks—small copper coins—per day was given him. There were upwards of 200 women, some ladies of distinction, in the mines where I was. These worked twelve or fourteen hours at breaking and sifting the ore. These wretched females were generally dead in a year, but their places were always recruited by fresh arrivals from Russia. The mine was a living charnel-house, the

habitation of gnomes, who went about their work with savage despair. Some chopped off their own hands and feet, thinking that if mutilated they would be saved from this fearful labour; but it merely hastened their end, and intensified their sufferings. Their punishment was greater than they could bear, and why was it imposed? Because they loved their country. Two young daughters of a Polish nobleman, aged nineteen and twenty, expressing indignation at the arrest of their brother for a political offence, were sent by the same relentless Government to share his labours, not in companionship, but in horrible association of suffering. Their beauty caused them to be desired by the licentious manager of the mine, who brought them to the daylight to be dishonoured. The elder, more proud, died by her own hand, preferring death to dishonour; the younger, more pliable, lived on in shame. But why was I released? My father gave the governor of the province 14,000 roubles, and the manager of the mine 1,000 roubles, to permit me to escape; but I could not escape; I could not walk for four months, I could barely move on crutches. A year after my release, I was sent to convey despatches; I was transformed into a Government courier. I came to St. Petersburg. I went on board an English ship. I concealed myself amongst the cargo until I let the captain know the story of my sufferings. In three weeks I found myself in London, a free man, with room enough to hate and to conspire against the tyrants of Russia. If I had 10,000 lives I would give them to deliver my compatriots groaning in the mines of Siberia. The Turkish Government is mild and merciful compared with that of Russia. I have lived in Turkey; I only left it because the Russian troops were advancing, and I had no wish to be shut up in Plevna. It was from the produce of these mines, wrought by labourers such as myself, that Russia attained the means of prosecuting this Turkish war, ostensibly for the purpose of delivering the Christian subjects of the Porte from oppression. Europe may expect to see, should Russia be permitted to occupy the Turkish empire, the population of whole districts deported to Siberia, to wear out their lives in the mines, the slaves of tyranny. My father was never the same man after he heard an account of my sufferings. He could not leave me estates, but left me £1,000 a year; so I can pursue science as I please. I have never recovered my hair, but remain a poor bald Pole.

Your humble servant,

STANISLAUS L——

London, *Feb.* 6, 1878.

ENGLISH AND AUSTRIAN INTERESTS IDENTICAL.

Of the inland countries of Europe, Austria is one of the most important. It is bounded on the north and west by Russia and Germany, and on the south and east by Italy and Turkey. Hence it is of the first importance to all these countries. The history of the House of Hapsburg is not bright in all its aspects, and the dark shadows predominate over the light. It is this imperial race that has held together various nationalities, of a most heterogeneous and antagonistic character. The prime cause of this union was the conquest of Constantinople by the Turks in 1453, which led to the extension and consequent consolidation of their power. The inroads the Turks made in Eastern Europe induced a concentration of power in the hands of those who opposed them. This opposition was mostly maintained by the House of Hapsburg. Eastern Europe progressed not so rapidly as the west, because it was not Protestant and not constitutional, but still it did progress, for the march of thought could not be stifled by its great enemy Rome, although it was retarded. Imperial Austria and Papal Rome formed close alliance. This alliance began, in the time of Luther, to oppose the Reformation, and was confirmed by the Concordat of 1853. Both powers had the same aim, that of the repression of truth. The governing race in the Austrian empire was German; it dominated over Hungarian, Croatian, Polish, Bohemian, and Italian nationalities. The antagonism between these races was so great that the Austrian Government could only maintain its authority by the sword and by the suppression of the right of public meetings, and by the restricted freedom of the press. The various Austrian provinces were therefore long in a state of chronic discontent. During the period which elapsed between the Reformation and the rise of the House of Brandenburg to the monarchy, the House of Hapsburg mostly dominated the German Empire, which was termed "Holy Roman." This Imperialism was for a long time elective, but the influence of the great states, Hungary and Bohemia, hereditary fiefs of the Hapsburgs, caused the Empire to remain mainly in their hands. The acquisition of Alsace and Lorraine by France was a great bar to the unity of Germany, while it contributed to the permanence of the Austrian Imperialisation. In the last century occurred the partition of Poland, a scheme which the rulers of Austria and Prussia deemed necessary for the maintenance of their hereditary states. For Poland was an elective monarchy, and the country was agitated every few years by an election which was frequently followed by Revolution. The Poles are a sclavonic people, sympathetic, intriguing, highly intellectual, and were dominated by a Teutonic aristocracy of a most turbulent disposition, but all with a taste for empire. Each one deemed himself born to be a king, and many were the battles that were fought amongst these kings, who could not choose any family to reign over them, so they were felt to be the enemies of the hereditary rulers, their neighbours. Hence the partition of Poland. As statescraft it was of questionable necessity; as morality it was a crime. Had it been followed by the gift of a constitution to the countries of which the divided Poland formed a part, it would have been a crime to be condoned by the result. But it was followed by measures of a na-

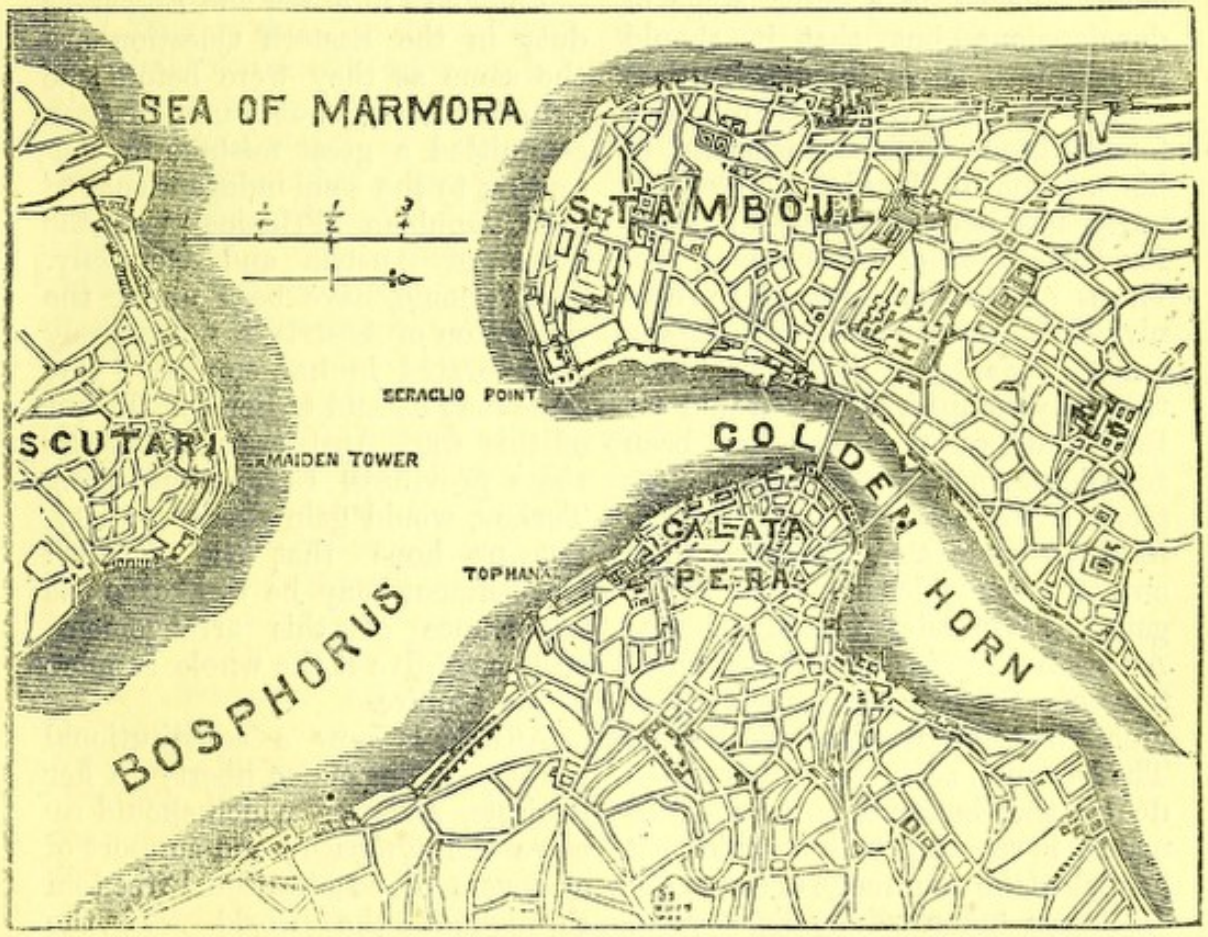
ture, as in the case of Russia, so tyrannical as to be a constant source of danger to the states.

The ambition of the French people, and their desire for universal empire, found expression in Napoleon I. By the Treaty of Vienna which followed his fall, Austria, Russia, and Prussia were maintained in their Polish acquisitions, and Austria in Lombardy and Venetia. One of the greatest proofs of genius displayed by Napoleon I. was his endeavour to unite nationalities, and by holding out to them the prospect of a separate government to alienate them from their present rulers. His policy was, however, selfish, for he aimed to substitute a new imperialism—*his own*—and to restore the divided Roman Empire on a basis as large as that of Charlemagne or that of Julius Cæsar. The Treaty of Vienna was the law which hoped to reverse the Napoleonic idea, and to unite together in a heterogeneous conglomerate, races which had no affinity and which could only be kept together justifiably by a government in which their interests should be individually considered. The 19th century found the Turkish empire weak and receding, and therefore no bar to its progress was required. On the contrary, the statesmen of the west felt that it was the principal barrier against the increasing power of Russia, which aimed at universal imperialism in the east. It was feared that should Russia obtain possession of Constantinople she would restore an empire so formidable that nothing but a coalition of Germany, France, Austria, and England could withstand her, and then only after a war more costly than any since the great wars which preceded the treaty of Vienna.

Napoleon III., in endeavouring to carry out the ideas of his uncle, proposed to give unity to Italy, intending to substitute the imperialism of France for that of Austria in Italy. But the idea was greater than the man; he was a dwarf attempting to wear the left-off clothes of a giant, and it is not surprising that he failed to wear out these borrowed garments. For Italian unity was finished against his wish, and against, it has been said, the interests of France. The people speaking the German language exceed by many millions those speaking the French, and the community of tongue facilitated the communion of ideas, notwithstanding the multitudinous states and the antagonistic Protestant and Catholic religions, which divided the people speaking the German language. But the great idea of nationality had become popular, and German unity was destined to follow and synchronise with Italian unity. The great exponent of German unity was Bismarck, the mightiest statesman born in this century. In pursuit of the policy of unity, the Danish and Austrian wars were undertaken. Napoleon III., weakened by disease and having been met by a policy even more astute than his own, found himself powerless to prevent the crystallisation of the North German states round the Prussian nucleus.

Fearing that this crystallisation might involve the South German States, he in 1869 declared war against Prussia. But he merely precipitated his fall and that of France from the position of arbitrator of the peace of Europe, which ten years before had been held. Italy and Germany became united, and the latter by acquiring the strategic positions of Metz and Strasbourg, took away the wedge which France had used from the days of Henry II. to those of Napoleon III. to keep asunder North and South Germany. Side by side with German unity and Italian unity there grew up a power denominated Panslavonism, which, although invented by Kollar, an Austrian, has

been adopted by Russia as a rallying war-cry. Should the Panslavonic idea be carried out by Russia and become a practical result, she would counterbalance the rest of Europe. It is a necessity for Austria's existence that she should lead the Sclavonic movement and be content to abandon Germany to Germany. The double Austro-Hungarian Government seems favourable to Austrian progress, for it affords a means of satisfying, by representation, the interests of the Sclavonic nationalities. A south Sclavonic empire, comprising Moravia, Galicia, Poland, Transylvania, Croatia, Illyria, Sclavonia, Turkish Croatia, Bosnia, Servia, Moldavia, and Wallachia, would be the best counterbalance to Russia. Unless Austria can possess herself of the mouths of the Danube, she will find herself overwhelmed by Russia, who during the present war has ruined the trade of Hungary, for the time being, by obstructing the navigation of the Danube. The policy of Austria should be to hold at all cost the



Danubian Principalities as commanding the navigation of the Danube necessary to the existence of her Empire. The interests of the semi-Christian Provinces of Turkey would be sufficiently protected by the new Constitutional system inaugurated by Midhat Pasha. Constitutional England should support Constitutional Turkey; the Russian system of government judged by its necessary penalty Siberia, is much more arbitrary and severe than the worst so-called Turkish misrule. If Russia, the north Sclavonic power, were to acquire Bohemia, Galicia, Croatia, Illyria, Transylvania, Moravia, and the Sclavonic Provinces of Prussia, as well as those of Turkey, she would possess a population of about one hundred millions, which would be but a realisation of the Pan-Sclavonic dream. But such would involve the destruction of Austria

and Turkey, and a considerable curtailment of Prussia, as well as the domination of Russia in Asia, both by sea and land. To give but common security to states outside this system, the entire male population of each must be trained to arms, and even such training would render them liable to be overpowered by the Sclavonic hosts of overwhelming numbers. If Europe is prepared to make these sacrifices she must tolerate Pan-Sclavonism. It is impossible but that it should meet with the opposition of Germany as well as of Austria in a later stage of development, but that it should fructify into an awful and fruitless war is in itself a gigantic calamity for mankind. Prince Bismarck, in his pursuit of the idea of German unity, has been encouraged to hope for the cession of the German provinces of Russia, in return for connivance at the spoliation of Turkey and Austria. But it is not likely that any compact which would tie the hands of Germany has been formed, seeing that the full development of the Sclavonic idea is calculated to more than counterbalance any strength which Germany might gain by the destruction of the Austrian empire, and the acquisition of its German-speaking provinces as well as those of Russia. The Slavonic nations are more than double the Germanic. Prince Bismarck is reported to have said that he wished the rough edge of the sword of Russia taken off by Turkey and England, before the sword of Germany was drawn against her. There can be no doubt that this represents German feeling and the views of Bismarck, who thinks that the other powers of Europe whose interests are greater than her own, should be the first to oppose Russia in her scheme for the destruction of the Turkish empire. Should the Turkish empire escape annihilation during the present war, Europe in fairness should allow her to try the effects of her new Constitution.

Constitutional government has become a necessity for European nations. The Emperor of Russia must shortly promulgate one, as a means of consolidating the various nationalities of the empire, as a a means of enlisting the sympathies of the West, and as a means of dividing the vast responsibilities of government which have increased with the increase of the empire, to a point beyond the governing power of one man.

England's interests and England's duty in the Eastern Question are the same as they were before the Crimean War; but our statesmen committed a great mistake by consenting to the semi-independence of the Danubian Principalities, the gates of Austria and Germany. They should have been under the protection of Austria, if not entirely incorporated in her empire. The same may be said of Servia. If, out of this war, Austria could acquire these provinces, Europe, including Turkey, would gain great security. Let us hope that the English Government may be awake to the importance of this arrangement, and may give it the whole support of the Empire.

Austria is now a constitutional country, giving much liberty to her subjects, and one which should receive the sympathy and support of all lovers of constitutional freedom throughout the world. If the Christian population of Bulgaria requires protection, it could be much better afforded by Austria than by Russia, considering that to the revolution which Russian agents and gold fomented, and to the arms which were introduced from Russia, the troubles in Bulgaria and this present awful war are chiefly due. The Russian Government has had its hands too much stained with the blood of Turkish subjects to be a judicious arbitrator between them.

If this war should result in the break-up of the Turkish empire, and a scheme for its partition find favour with Europe, Italy and Austria might divide its European portion with security to England. Should Russia absorb it, the balance of power both in Europe and Asia would be completely overthrown. The very existence of the British Empire would be imperilled. The Black Sea and the Mediterranean would be dominated over by Russia, and India would be invaded by Russian, Persian, and Affghan allies. Will our colonial system stand such a shock as this? Will our widely-scattered colonies not claim independence, in order to be free from the attack of a Russian fleet, and from the expense and sacrifice of time which their defence would involve? Should such a consummation ever be reached, history will lay the blame at the door of the peace-at-any-price party in England, who encouraged Russia to invade Turkey, and whose watch-words were, "Drive the Turks out of Europe," "Perish our Indian Empire." We believe, however, that there is sufficient patriotism left in Britons to avert such a catastrophe as this, and by a firm alliance between England and Austria, put a stop to the Muscovite, who seems on the point of murdering the poor Turk. If the crimes of Turkey were worse than they have been, they have surely been expiated by the punishment they have received, which, we believe, will be found almost as great as history can record. And these crimes were of Russian instigation. Russia was the true author of the Bulgarian massacres. The world has never known greater hypocrisy than the claim of Russia to be the deliverer of the Christian subjects of the Porte from oppression. Let Russia be tied down to the declaration of her Emperor before the war, and by which the neutrality of England was secured, that all conquest and aggrandisement were disclaimed, and that her sole object was to maintain the interests of the oppressed Christian subjects of the Porte.

The interests of England in the Eastern Question are so great that rather than let Constantinople fall into the hands of Russia, she herself should occupy it. Such would be a blessing for humanity, and would do more to revive trade than a hundred meetings of demagogues, willing to sell their country to Russia if party interests can in the least degree be served thereby. England and Austria should act together in this matter: Austria on the north, England on the south. If, on the contrary, the false Liberalism of England is successful in its alliance with the assassin of the Turkish empire, and he is allowed to possess Constantinople—the key of Eastern Europe and Western Asia—Europa may find herself involved in the coils of a monstrous serpent, which has long been growing between the Volga and the Don, whose glance has fascinated her until she finds it is too late to escape being swallowed as a whole. In vain she might cry for mercy: a serpent knows no mercy; it is as cold-blooded as Siberia.

"In fifty years Europe will either be republican or Cossack." (Napoleon I.)

It was with a kiss of peace that Judas betrayed, and the Innocent was led to execution. The guilt of blood falls on a nation that betrays. The guilt of murder of thousands of innocent women and children, who have been massacred, who have been violated by the savage soldiers of Russia during this war, must be divided between the Russian instruments and the British instigators. The presence of a British fleet at Constantinople, accompanied by resolute words, would have prevented this war.

THE ORIGIN OF WRITING AND READING FROM NATURAL OBJECTS.

READING AND WRITING stand at the head of knowledge; they are the parents of civilisation; hence the efforts which those who would read its genealogy have made to discover the origin of alphabets. It will be admitted that every art is more or less a repetition of nature, so the art of writing is an attempt to give practical effect to this great principle. Hieroglyphics were used in ancient Egypt, Peru, Mexico, and Polynesia to express ideas in forms more or less natural, and it is often alleged that the letters of the Cadmean alphabets were modifications of Egyptian hieroglyphics. Some authors, again, held that the letters of the Hebrew alphabets were derived directly from natural objects, from the fact that some of them at least, as Aleph, which means an ox, are words signifying natural objects. But the resemblance between these characters and the objects cited by such writers as Drs. Young and Boeckh is so remote that it would not be reasonable to infer that the forms themselves were borrowed from them, from mere resemblance alone; so we are induced to start afresh on a survey of nature, with the object of discovering the natural alphabets. In a future number a review will be given of the principal works treating of alphabets and their origin. In the course of about six years' research I have been able to discover a complete series of Hebrew, Greek, and Roman alphabets and Arabic numerals on natural objects, and have gathered the specimens together thus inscribed, so as to be able to set the question of these alphabets and Arabic numerals at rest for ever, as not of human invention, by as designed by the Author of nature to point out the chief tools that were to be used in the development of mankind.

Besides the Roman and Greek alphabets and Arabic numerals, I have found characters forming parts of alphabets in the following languages — Phœnician, Etruscan, Egyptian hieroglyphics, Samaritan, Sanskrit, Arabic, Runic, Chinese, Japanese; and about thirty other forms of writing. I shall not speak more of this part of the subject, but shall proceed to describe the specimens on which I have found the Hebrew, Greek, and Roman alphabets.

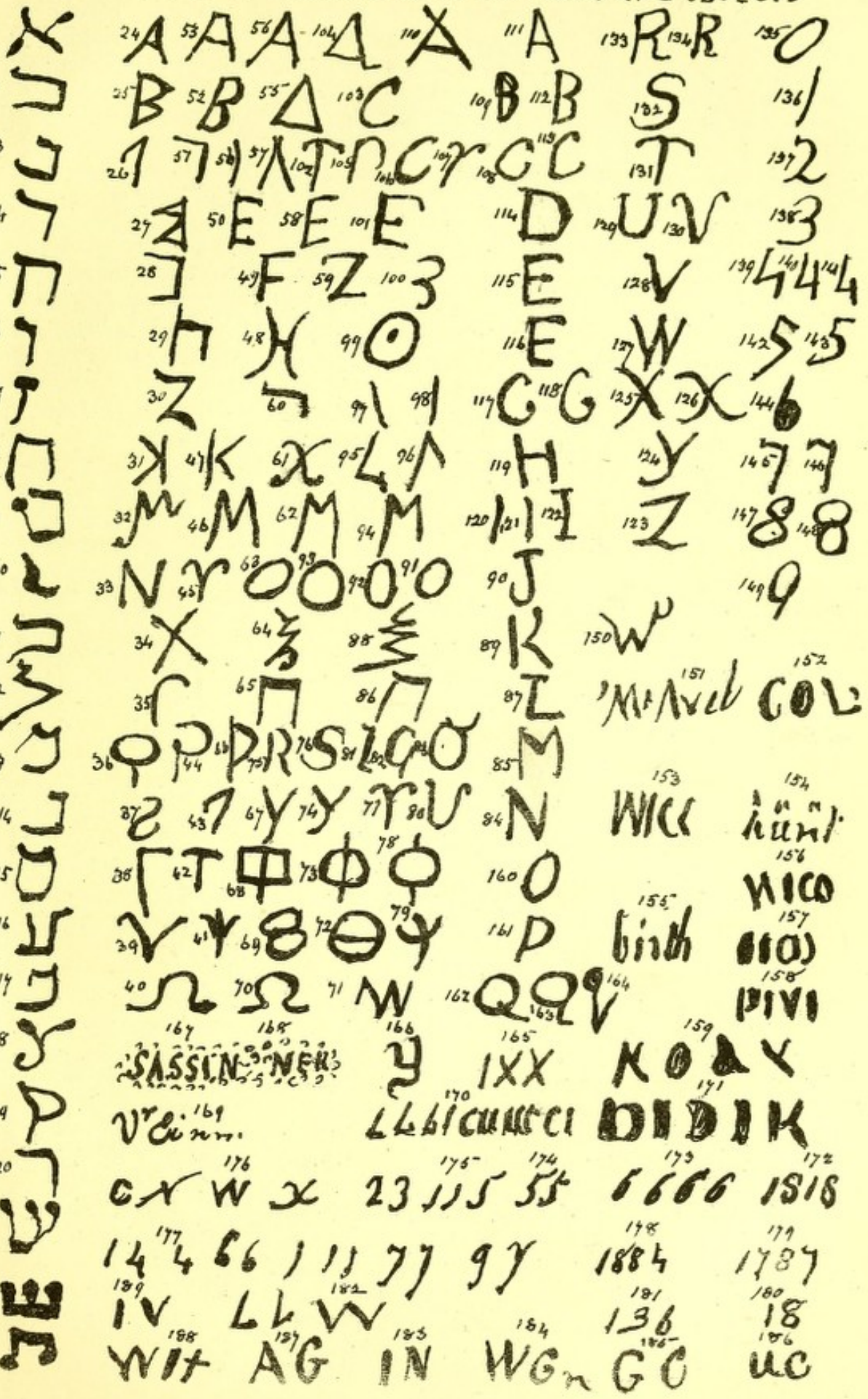
I have put writing first, as it must naturally have preceded reading in the history of civilisation, although anciently, as now, reading was first taught in the schools.

I have arranged diagrams which show enlarged representations of a few of the objects on which this paper is based, some of which are copied on the illustration accompanying it.

Arithmetic had its origin thus: One stood for the individuality of man; two for his two eyes, two ears, two hands, two feet, &c. All multiplications of two were founded on this basis. Three was a natural addition of one and two. Five represented the fingers of one hand or the toes of one foot; ten the fingers of both hands or the toes of both feet. Letters were in time sought to represent these numbers; hence the adoption chiefly from Greek, Phœnician, and Etruscan alphabets of the so-called Arabic numerals.

Linnæus, Hubner, and numerous other entomologists and conchologists have indicated, by the specific names they have given to insects and shells, their observation of defi-

FACSIMILE OF CHARACTERS ON NATURAL OBJECTS



nite characters, numbers and human similitudes thereon. But this was done in such a cursory manner that the most striking resemblances between art and nature, and between lower forms of life and man, were not noticed. Having had a pretty extensive acquaintance with natural objects during the last twenty years, and possessing a collection of 150,000 specimens of over 40,000 species, I thought I would review it with this object, and separate those specimens which had characters and Arabic numerals on them.

It will easily be seen that I have entered on a vast subject, and one which would occupy hundreds of pages to do more than barely allude to; but I am induced to make these facts known to endeavour to open up a new field of observation in natural history — *Natural Paleography.* The characters most frequently found on natural objects are certainly those of the seven Cadmean alphabets. But modern Hebrew and Greek characters are still found, although the predominance is certainly in favour of the Uncial, the Archaic, and the inexact types of letters. (*See plate.*)

Of natural objects, none are so prolific in marks as the genera Oliva, Conus, Chione, Tapes, and Venus amongst molluscs. But very clearly defined letters are found on Bulla, Meroë, Phasianella, Terebra, Columbella, and Lioconchus.

Of insects, the butterflies afford many characters. The subject is so large that I cannot at present say what families are most prolific in them. Shells and insects afford a very large number of Arabic numerals, sometimes singly, but more frequently grouped, as if indicating a quantity or a date. I have on butterflies the numbers 7,588, 123, 100, 1,718, 1,505, 1,878,* 1,871, 1,071, 10, 777, 157, 11,515, 1,111, 11,113, 851, 15,373, 3,311, and 18, all occurring on insects I possess; and the numerals 8, 3, 4, 104, 144, 66, 111, 77, 97, 1,518, 23, 115, 55, 1,787, 1,324, 136, 151, all occurring on shells.

A *Conus monile* is marked with a Roman N and L, the Greek gamma, and the Arabic 8, which also signifies in Servian U K. The letter W is perhaps the most abundant character both on insects and shells, and the figure 8 is the most common amongst numerals. The Greek letters chi and gamma are very common. The Hebrew letters samech and daleth are easily found.

The characters vary greatly in their mode of formation, from very rustic to common type, and from precise to fantastic forms.

The letter T also is extremely common. On an olive shell I T is found a note of exclamation and I I V, which expresses a number in Roman numerals. One olive shows H E E; another, a great mass of cuneiform letters. A small Venus is almost covered with minute Phœnician, Samaritan, and Etruscan characters.

Two small British lichens, *Graphis elegans* and *Graphis scripta*, show about half the Cadmean Greek alphabet. Rocks and minerals show letters and numerals. A piece of trap rock exhibits the Hebrew mem, the Roman J, the Hebrew daleth, and C G clearly defined; a hematite, daleth; a piece of onyx, the Russian tse; on arseniate of copper, U; and on clear quartz, N; on the bivalve Tapes are the rather significant letters M P, reminding us at once of a Member of Parliament and of Pontifix Maximus; and C J G N on Anomalocardia, a bivalve shell. On Oliva is found what appears to be a broken Roman inscription—L L L I C U U I C I;

* The butterfly bearing the figures 1878 is known as *Melitea silene*, the April or mall pearl-bordered fritillary. It seems appropriate that it should appear on the cover of a Spring magazine of 1878.

upon a large *Bulla ampulla*, Roman, Greek, Arabic, Samaritan, and Hebrew letters. On *Tapes tetrix* there is a very plain (½) mark, which may either mean a halfpenny or one shilling and twopence; on *Oliva utriculus* U^{r}; on another Oliva, the well-known Etruscan word and the French surname of *Mr Avil* and B B R; on a species of Venus Vr. Einm. The letter q, the rarest of all the letters to find, is on this specimen. On *Lioconchus castrennensis* is shown a very clear Thibetian inscription of some length. One of the most remarkable shells I have examined is an example of the common garden snail (*Helix aspera*). With a powerful magnifying glass this shell is shown to be nearly covered with Greek and Etruscan letters, Roman characters, and Arabic numerals. R A is conspicuous, and a note of interrogation, which almost forces us to ask why these marks are placed there. On *Helix vermiculata* I C is found. On another *Helix aspersa* the words "this is" are readable. On another *Helix vermiculata*, in ornamental characters, "Sassin neg" are placed. On *Oliva erythrostoma* I N and W G N are found. On another Oliva, the word Wit and the initials A. G. and W. G. are seen.

The Arabic Cowry, *Cyprea arabica*, has long been noticed to have marks resembling Arabic letters. One has a Sanscrit inscription in addition to the Arabic. A mocha-stone has "C Der." I have found a large number of monograms on natural objects. An olive has the word PUNI in Roman characters on it. Another olive has what is especially interesting to a naturalist, the letter G, and at a little distance C U V, the abbreviation for the name of, perhaps, the most distinguished scientific man of modern times, George Cuvier.

In the history of philosophy the claim of originality is admitted in favour of an author who is the first to propound observations or inventions. So in accordance with this universally admitted principle, we are compelled to assign the origin of alphabets to the Author of Nature. This leads us at once to the fountain-head of knowledge.

In supplying a city with water it is obtained in its best and purest form by forming reservoirs as near as possible to the original springs. So man is best educated by receiving intellectual draughts as nearly as possible from the great Fountain of Nature. The student, the more close is his tendency to follow Nature rather than art, the more he will walk in those sweet paths which lead rather to the "books in the running brooks" and to that vast chapel bounded only by the stars and the earth, where "sermons in stones" are daily read. Hence the scholar of Nature creeps unwillingly to school, lest he should be poisoned by impure air, or cramped within these narrow grooves which competitive and professional selfishness has wrought. The neglect of the study of natural objects in a systematic form, particularly in their reference to practical life, and the pursuit of antiquated book-lore, have caused many a fine mind and body, built in the broad form, to become in maturity the caricature of a classical scholar, wanting in all those lineaments of grace which once adorned men of true classic mould, and wanting in that knowledge of natural objects, the quadrupeds, the birds, the fishes, the insects, the plants, microscopic life, the world of organic remains, and of those crystalline forms which live and multiply in dead inorganic life. These, in their uses to man, are the best educators for all men; their principia, their alphabets, to be compared with the alphabets which man is supposed to have invented, but really has but adopted from nature. Viewed in this relation, philological studies become en-

larged, so as to be less capable of cramping human thought, but bringing it more in harmony with those mighty minds, such as Homers', Aristotle's, Pliny's, Dioscorides', Euclid's, Archimedes', which in classic times studied Nature. Would we approach them in mental power, we must primarily study Nature, and then we may examine their works, and see how far they are in accordance with Nature. If the youth's first studies lie in the domain of books rather than in that of nature, his tendency is to be a mimic rather than a philosopher, an unfit companion for the great men whose works he imagines he comprehends. The decline of a philosophical spirit of inquiry in this age is mainly due to specialisation in scientific pursuit, to isolation of thought, to looking at an object from one point of view instead of from many, and entirely ignoring the time, the temperature, and the atmosphere of its surroundings.

C. O. Groom Napier.

(To be continued.)

EXPLANATION OF PLATE I. (ALPHABETS).

The alphabetic characters and Arabic numerals are facsimiled from the natural marks on the objects. The small numbers are put on the plate for the purpose of identification. No. 1 is on Conus erythræensis, 2, 3, and 6 on Cyprea Arabica, 4 on Oliva, 5 on Arabica, 7 on Mitra episcopalis, 8 on Cerithium obeliscum, 9 on Strombus, 10 on Oliva, 11 on Strombus lentiginosus, 12 on Oliva, 13 and 20 on trap rock, 14 on Arabica, 15 on Oliva, 16 on Conus monile, 17 on Pisana, 18 on Conus erythræensis, 19 on Columbell apardalina, 21 on Conus monile, 22 on Mitra episcopalis, 23 on Jasper, 24 on Oliva, 25 on Oliva, 26 on C. Arabica, 27 on Oliva, 28 on C. Arabica, 29 on C. Arabica, 30 on C. Arabica, 31 on Oliva, 32 on C. Arabica, 33 on Oliva, 34 on Oliva, 35 on Tapes, 36 on C. Arabica, 37 on a butterfly, 38 on Oliva, 39 on Cerithium obeliscus, 40 on C. Arabica, 41 on Acronycta psi, 42 on C. Arabica, 44 on C. Arabica, 45 on Oliva, 46 on Oliva, 47 on Oliva, 48 on Oliva, 49 on Oliva, 50 on Conus, 51 on Oliva, 52 on Oliva, 53 on C. Arabica, 54 on C. Arabica. 55 on Oliva, 56 on Oliva, 57 on Oliva, 58 on Oliva, 59 on Oliva, 60 on Oliva, 61 on Oliva, 62 on C. Arabica, 63 on Acronycta ligustri, 64 on C. Arabica, 65 on C. Arabica, 66 on Graphis, 67 on Oliva, 68 on Venus, 69 on Oliva, 70 on Conus, 71 on Oliva, 72 on Venus, 73 on C. Arabica, 74 on Oliva, 75 on C. Arabica, 76 on Oliva, 77 on Oliva, 78 on Oliva, 79 on C. Arabica, 80 on C. Arabica, 81 on C. Arabica, 82 on C. Arabica, 83 on C. Arabica, 84 on Oliva, 85 on Oliva, 86 on Conus, 87 on Oliva, 88 on Oliva, 89 on Oliva, 90 on C. Arabica, 91 on C. Arabica, 92 on C. Arabica, 93 on a butterfly, 94 on Oliva, 95 on Chione, 96 on C. Arabica, 97 on Oliva, 98 on Oliva, 99 on a butterfly, 100 on Oliva, 101 on C. Arabica, 102 on C. Arabica, 103 on Conus, 104 on C. Arabica, 105 on Oliva, 106 on Oliva, 107 on Oliva, 108 on C. Arabica, 109 on Oliva, 110 on C. Arabica, 111 on Oliva, 112 on Oliva, 113 on trap rock, 114 on a butterfly, 115 on Conus, 116 on C. Arabica, 117 on Helix, 118 on trap rock, 119 on Bryophila glandifera, 120 on a butterfly, 121 on Venus, 122 on Oliva, 123 on Oliva, 124 on Oliva, 125 on Acronycta psi, 126 on Venus, 127 on Oliva, 128 on Oliva, 129 on C. Arabica, 130 on Oliva, 131 on Oliva, 132 on Oliva, 133 on C. Arabica, 134 on Oliva, 135 on C. Arabica, 136 on Oliva, 137 on Oliva, 138 on Oliva, 139 on Venus, 140 on Tapes, 141 on Strigatella litera, 142 on Oliva, 143 on Oliva, 144 on A. niphæ, 145 on Melitea silene, 146 on Tapes, 147 on Oliva, 148 on Strombus, 149 on Tapes, 150 on Oliva, 151 on Oliva, 152 on Conus mille punctatus, 153, 154, 155 on C. mille punctatus, 156, 157, 158, on C. punctatus, 159 and 171 on C. punctatus, 160 on C. Arabica, 161 on Graphis, 162 on Oliva, 163 on Venus, 164 on Oliva, 165 on Oliva, 166 on Agate, 167, 168, on Helix vermiculata, 169 on Venus, 170 on Oliva, 172 on Strombus, 173 on Conus, 174, 175, on Strombus, 176 on Conus nussatella, 177 on Tapes littoratus, 178, 179, on Venus, 180 on Oliva, 181 on Venus, 182 on Oliva, 183, 184 on O. erythrostoma, 187, 188 on Oliva, 189 on Oliva.

ANCIENT KNOWLEDGE OF PRECIOUS STONES.

THE Pentateuch contains the earliest record of these imperishable substances,* which although mostly hard and difficult to engrave, yet preserve designs better than any other material. The ancient Hebrews, and in truth all Oriental nations, attached a symbolic meaning to precious-stones. Thus the shâmîr, translated briers in Isaiah v. 6, is, in Jeremiah xviii. 1, used to denote a hard stone, "the point of a diamond." The briers and thorns "sprang up in the heritage of the Lord," and took the place of agricultural produce, emblematic of what is hard and stony instead of what is good and wholesome in man's heart. In Isaiah ix. 18 and x. 17 the Israelites were spoken of as briers and thorns. The thorns contained a great deal of hard, stony matter, and would scratch and tear the skin, just as the adamantine spar or corundum — the adamant of Scripture—does, most stones which are rubbed against it producing deep and indelible scratches. The prophet Ezekiel (iii. 9) was said to have a forehead as adamant, harder than flint. It is well known that adamant is so. In Zechariah vii. 12 the hearts of Israel were described as adamant, which was the hardest substance known to the Jews. Emery and corundum have much in common; they are both alumina, infusible by heat. Pliny speaks of this stone as not melted by fire, proving that he was not speaking of the diamond, which is combustible. The corundum is the lapidary's polishing medium in the East, while diamond dust is that of the West. The corundum is found in Canton, Ceylon, Mysore, the Ural, St. Gothard, Sweden, Lapland, and Connecticut. Emery is found in Italy, Spain, and Saxony, as well as at Gumuchdagh, twelve miles from Ephesus. Corundum is derived from the Sanscrit *Korund*; its crystals are of a hexagonal form and of all colours. The agate derived its name from Achates, a river in Sicily, now called Dirillo, which, according to Pliny, was their first locality; but they are found in almost every country and are almost infinite in variety of colour. The agate is a banded or spotted stone, its basis being quartz, and the colouring matter being the oxides of various metals. It was in the breastplate of the Jewish high priest; *Cadcôd* is the Hebrew word used to express it. In Isaiah liv. 12 it is said, "I will make thy windows of agate," which seems to imply a transparent and light-coloured variety. Mocha stones, which simulate fossil vegetables, derive their arborescent form from infiltration during crystallisation of the salts of copper, manganese, and iron. Moss agates are enclosures in a siliceous matrix, of the remains of zoophytes.

The chalcedony, an intimate mechanical mixture of crystalline and amorphous quartz, is of a grape-like form, and when cut presents curved bands of different colours. It is more transparent than the agate, and in the type is of a pale lilac colour. The chalcedony of Theophrastus was obtained from Calcedonia in Asia Minor, which gave its name to the stone; it was a crystallised carbonate of copper or malachite. Pliny described it as of the green and blue seen on the neck of pigeons or on the tail of a peacock. The chalce-

* A coloured photograph of upwards of twenty precious stones, including those mentioned in the Bible, has been prepared. It can be had from the Editor, 18 Elgin Road, St. Peter's Park, London, for 1s. 8d.

donius of the Greek of Revelation i. 19 was probably this stone. The jasper is a variety of quartz quite opaque, but the jasper of Rev. xxi. was clear like crystal. The jashpheh of the Hebrew Bible is rendered in the Septuagint onyx, but in the Vulgate beryl—a sufficient proof of the doubtful identification of it. A clear stone like the jasper of Revelation comes nearest to our ideal of a diamond. The jasper was the twelfth stone in the high priest's breastplate. The Hebrew term jahalon, derived from *halam*, to strike, points to the cutting or engraving use of the diamond. It was one of the stones of the breastplate.

The diamond is, next to the ruby, the most valuable of substances, and has been prized for many ages. Although the most favourite specimens are colourless, yet they are found of all colours.

They are sold by the carat (3¼ grains troy). The price of a diamond of one carat, brilliant-cut, is £12; while in the last generation the same stone could have been procured for £8. Rose diamonds are worth a third less than brilliants. The value of diamonds increases in the proportion of the square of the weight. A brilliant of 2 carats is worth £48, one of three carats is worth 9 times £12,* or £108†. The brilliancy and purity of the colour of diamonds has much to do with the price, and influences it to the extent of three or four fold. Thin diamonds, which will not cut as roses or brilliants, are of the least value. They are only fit for making into "doublets," which consist of a veneer of precious stones on the top, with a bottom of counterfeit; a contrivance by which a very brilliant jewel is often obtained, equal in many cases to a real stone of the second water.

According to Charles Barbot ("Traité complet des Pierres précieuses," p. 237), a rough diamond of one carat is worth £6. When eight diamonds go to the carat, it is worth £5 12*s.*; when sixteen, it is worth £6; when twenty, £6 8*s.* These prices appear to be a little arbitrary, and must be occasioned by the demand for stones of a certain size. The price of brilliant-cut diamonds weighing 3 grains is £9 12*s.*; weighing 2 grains, £8 8*s.*; weighing 1 grain, £7 4*s.* per carat. When sixteen go to the carat, they are worth £7 12*s.* But the smallest stones are much more expensive in relation to weight, on account of the great amount of labour spent in cutting them; for when from 200 to 500 go to the carat they are worth 1*s.* apiece. Diamond dust is sold for £50 an ounce; it is the principal means used in England for cutting and polishing all stones as hard or harder than quartz. It may be interesting to mention a few of the largest diamonds known.

One of the finest is "the Pitt," which was bought for £135,000 by the Regent, Orleans of France, and was brought over by Governor Pitt from India. Of it Pope says:‡

> Asleep and naked as an Indian lay,
> An honest factor stole the gem away;
> He pledged it to the knight; the knight had wit,
> So kept the diamond, and the rogue was bit.

The fact of the matter was, that a soldier coveting the jewel, caused himself to be made priest to an idol, of which it formed the eye. He removed the diamond eye, and replaced it by one of glass, and got off with the stone. After changing hands, it was purchased by Governor Pitt, who made a large fortune by its sale. It weighs 136⅞ carats, and has been variously estimated at from £16,000 to £480,000 in value.§ The Sancy

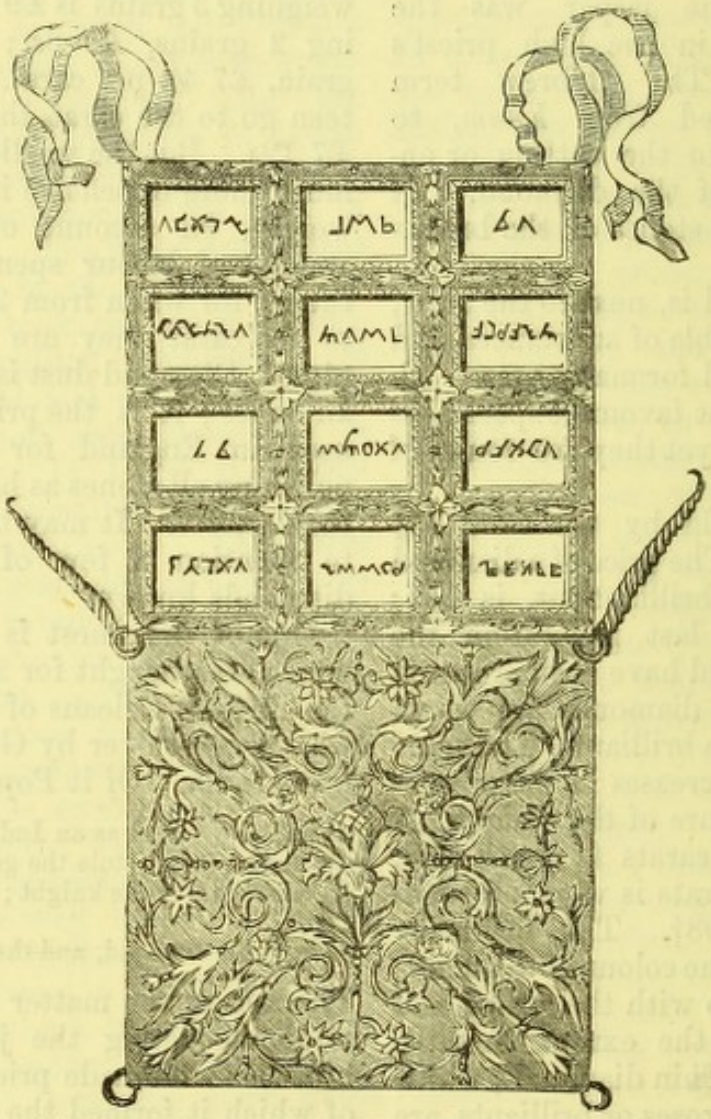
* These are stones of the second quality.

† "Underground Life."

‡ Macaulay's Essays.

§ "Underground Life." The cutting of this stone, Emanuel says, cost at first £2,000, and afterwards £3,500.

diamond, which adorned the helmet of Charles the Bold of Burgundy, fell from it on the famous battle of Granson, where it was picked up by a French soldier, and purchased in 1589, by Nicolas Harlay de Sancy, treasurer to Henry IV. It was purchased by Prince Demidoff for £75,000, in 1838; and in 1865, by Sir Jamset Jeejeebhoy, for £20,000; its weight is 24¼ carats.* The Austrian, or Tuscan diamond, which was also said to have been lost by Charles the Bold of Burgundy, resembles a yellow topaz in colour, and weighs 139½ carats. The *Koh-i-noor*, that is, Mountain of Light, is traditionally said to have been worn by Rajah Karnah, 3001 years B.C.; it weighed in the rough 793 carats, but had little brilliancy as a jewel, and after a great expenditure of time and



BREASTPLATE OF THE HIGH-PRIEST, AS DESCRIBED BY JOSEPHUS.

money it has been successfully cut, under Mr. Costa's superintendence, as one of the finest jewels extant.†

"The Hindoos," says Mr. King, in his "Precious Stones," p. 74, "trace out the curses and the ultimate ruin inevitably brought by the *genius* of this fateful jewel (the Koh-i-noor) upon its successive possessors ever since it was first wrested from the line of Vikramaditya. And in fact its malevolent influence, if we glance back over its history since 1304, far exceeds that of the Necklace of Eriphyle, or the Equus Scianus of Greek and Roman tradition. First falls the vigorous Patan, then the mighty Mogul Em-

* "Underground Life."

† *Ibid.*

pire, and, with vastly accelerated ruin, the power of Nadir, of the Dooranee dynasty, and of the Sikh. In fact, Runjeet was so convinced of the truth of this belief, that having satiated his covetousness in the enjoyment of its possession during his lifetime, he vainly sought to break through the ordinance of fate, and avert the concomitant destruction from his family, by bequeathing the stone to the shrine of Juggernaut."

A diamond in the possession of the king of Portugal, which was found in Brazil, has been valued at £3,200,000 sterling. This gem is said to weigh 1,680 carats. It was originally much larger than at present.* But in "Underground Life," English translation, it is said, "Malicious people pretend that it is only an old topaz." White Brazilian topaz is the nearest approach to the diamond, being extremely hard and very brilliant, but without its adamantine lustre and iridescent play of colours.

The largest price ever actually given for a diamond was £150,000.†

Mr. Dresden's diamond, which excited so much admiration in the International Exhibition, was sold to a member of the Jeejeebhoy family for £50,000.‡

The Cumberland diamond, which weighs 32 carats, was presented to the hero of Culloden by the City of London, by whom it was purchased for £10,000.§

"The search for precious stones is very systematically pursued in Brazil; that for diamonds in the provinces of Bahia and Minas-Geraës, where it is carried on by companies employing numerous hands, or by individual settlers. The precious-stone is not only contained in the sands and cemented gravels, but also in the talcose sandstones, the itabirite and itacolumite rocks, the quartz grains of which are interspersed with crystals of magnetic-oxide of iron. These rocks, whose names remind us of the chief gemmiferous Brazilian localities, contain the diamond in place, not in a rolled or partially rounded state, as it occurs in the *cascalhas*, but in the same crystallised state in which it was originally formed. It is asserted by M. Liais and others that the green porphyritic rocks and serpentines are, on the contrary, the principal diamond-bearing rocks."‖

"The gemmiferous sands are worked in Brazil by washing them in a bowl, or in a running stream of water, by slave labour, carried on under the eyes of vigilant overseers. The pick and shovel are used for breaking up the diamond-bearing gravels, almost in the same way as they are employed by the Chilians in washing for gold. The water carries away the clay, fine dirt, and sand, and the larger lumps are thrown aside by hand; the middling-sized gravel that remains being picked over in the open air, where the sunshine playing upon the faces of the gem readily leads to its detection by experienced eyes. The searchers have a particular knack in doing this, and it is wonderful to see how they perceive the smallest particles of diamond amongst the largest heaps of pebbles."¶

The specific gravity of the Indian diamond when colourless is 3·524, when yellow 3·556. The Brazilian when colourless is 3·442, when yellow 3·520. The first is octahedral, the second is dodecahedral in its crystalline form. And this increased specific gravity is accompanied by greater hardness and brilliancy. The refractive power of the diamond is 2·487; that of glass is 1·525, or little more

* Art. "Diamond," "Cassell's Biblical Dictionary."

† See "Cassell's Biblical Dictionary."

‡ The Dresden diamond. Mr. Emanuel says, "This fine diamond recently passed into the possession of a Parsee, who, it is said, has disposed of it to an Indian prince."

§ Emanuel, p. 80.

‖ "Underground Life," p. 513.

¶ *Ibid.* pp. 511, 512.

than half. These figures are but a precise method of indicating the amount of brilliancy.*

Mr. Emanuel, in his additional notes to the new edition of his "Diamonds and Precious Stones" (1867), gives us this information: A one-carat† diamond, brilliant-cut,‡ and perfect in all respects, is worth £25, and one of five carats £350. The value of these stones has within the last two or three years increased 9 or 10 per cent., but large stones were dearer formerly than at present. From an interesting table given by Emanuel (p. 94) of the value of diamonds sold in Venice, 1606, by the diamond merchant Giovanni Ricardo, it appears that brilliants were then very nearly the same price as at present.

(*To be continued.*)

THE BURLINGTON ARTS CLUB EXHIBITION OF THE WORKS OF RAVEN.

THERE died at Harleck, in Wales, while bathing, on July 13, 1877, John Samuel Raven, an original artist, some of whose works are destined to attain a great celebrity. His father, the Rev. Thomas Raven, of Trinity Church, Preston, was likewise an able artist. The son had scarcely any art education, but appears to have first studied the works of Crome, Constable, and Thompson, of Duddingstone; afterwards he adopted the Pre-Raphaelite mannerism in all its glaring bright tints. His works of this class are unsuccessful, but such a piece as the "Midsummer Moonlight" is worthy of a painter of the highest reputation. It is one of the most original works in existence, and most true to nature. 40 is a picture which awakens similar emotions; they illustrate Longfellow—

> And as the moon from some dark gate of clouds
> Casts o'er the scene a floating bridge of light,
> Across whose trembling planks our fancies crowd
> Into the realm of mystery and night.

No. 2, "Green Corn," is a small Pre-Raphaelite picture. 6, "Craig Vinean near Dunkeld," displays a glaring lilac hill reflected in the water; it is a very bad specimen of the school. 3, "The Lesser Light to Rule the Night: Cerred Cennen Castle, North Wales," is rather natural; overhead is a large assemblage of fleecy clouds illuminated by a rising moon not yet visible behind a hill; the lurid glare of a fire serves only to intensify the twilight of a glen shrouded by the hill. 4 is an interesting study of sheep in a wood; the light comes through the green leaves, and diffuses the citrine glow of early summer over all. 5, "The Grande Route of Fontainebleau;" it might have been painted by Constable. 7, "Aspens in Spring Bud," painted in 1876 but never exhibited, is a somewhat coarsely executed picture of little artistic merit, although the ruddiness of the setting sun reflected on the foliage is very well depicted. 8, "St. Leonards," painted probably in 1851, might be an early study of E. Cooke, R.A. 10 and 16

* Emanuel, p. 49.

† The term "carat" had its origin from the Arabic *Kuara*, applied to an African seed, almost invariably of this weight, which rows on the Gold Coast. Emanuel, p. 55.

‡ The first operation in diamond cutting consists in rubbing two stones together, by which two facets, or flat-places, are simultaneously formed.

have a most Constable look, and are very pleasing and artistic. 11, "Let the Hills be Joyful together," a view taken from the Brathay Churchyard, Ambleside, is very beautiful; it and 19 have the beauties of the Pre-Raphaelite school, *i.e.*, minute delineation of nature from a lovely aspect. "The Rooks' Parliament" (12) is a truly natural transcript of the every-day life of birds. "The Fresh-fallen Snow on the Matterhorn" (15) fails to please, although it is natural; isolated mountain peaks of this altitude throw no shadow, and are surrounded generally by impalpable clouds; hence they are most difficult subjects for a painter. "The Highlands after Rain" (20), although dark and indistinct, is much better. "The Lago Maggiore from Stresa" (21) is a Pre-Raphaelite work which aims to depict an impossibility—the daylight transparent atmosphere of Italy; it forms an intense contrast to "The Deer Forest" (22), a picture of Turner-like obscurity. From these failures, we turn with relief to 23, "Barff Lord's Seat from the Slopes of Skiddaw;" a fine bit of Welsh scenery. Our enthusiasm rises on looking at 24, "A Study;" a gem full of the sweet aspect of a wood, in which one can repose in spring. 25, "The Skirts of a Mountain Farm," is a pleasing though Pre-Raphaelite-like picture, painted with great care; a perfect transcript of leaves, ferns, rocks, and lichens, seen through the clear atmosphere of an August day. 27, "The Monk's Walk," depicts a spot fit for gloomy and solemn meditation. 28, "Beechy Head in 1852," is very deficient in light and shade; in truth, a chalk cliff throws but bad shadows. 29, "Twilight:" for combined finish and artistic effect this and 27 are the finest in the collection. 32, "Fontainebleau," is a pretty Nasmyth-like picture. 34 is "A Voice of Joy and Gladness;" a blackbird sits on a branch of a cherry tree in full bloom, against a glaring blue sky; this spoils the picture, which is a pity, considering the sweet sentiment it is intended to convey—"The winter is past, the spring is over and gone, the time of the singing of birds is come." 37, "The Philosopher's Stone, 1865," is a woodland landscape, painted with exquisite feeling; the light falls upon a birch-tree on the right-hand side, and brings out the beauties of its variegated bark. But modified praise can be given to 41, "A Hampshire Homestead," which discloses tall poplars, backed by a lilac sky and a little farmhouse. 42, "May Morning, a View near St. Leonards, 1854," is a regular Sussex scene, but the clouds are coarsely painted. 43, "An Autumn Glade in Eridge Park," is a pretty woodland picture, but in the dim light of the scene the deer are not unnaturally somewhat like very different animals: they remind us of emus.

THE RIGHTS OF NATIONS: A NEW MAP OF EUROPE.

INTERNATIONAL CONGRESSES miss their mark if they do not regard the rights of nations. The wheels of the machinery of States are clogged by the obstructing rights of nations. The terms Pan-Teutonism, Pan-Sclavism, Pan-Latinism express principles which may develop into practice—theories at present, they may become facts. The current of nations is running so strong in these three streams, that the most skilful efforts of the statesman are necessary to direct it—it cannot be stemmed; those who oppose it will be carried away by it. Let the leading statesmen of Europe make up their minds this year how far they will go; they may yet pacify Europe. Should they by patchwork endeavour to maintain the old system, they will be involved in an inundation. Germany and Austria have at present a solemn mission; the German-speaking race should be governed by one Emperor. In the new map the successors of the Emperor William would, in addition to the States they already possess, dominate Austria, Styria, the Tyrol, and Illyria. The German northern capital would be Berlin, the southern Vienna. The Hapsburg dynasty would govern Bohemia, Moravia, Gallicia, Posen, Hungary, Croatia, Sclavonia, Servia, Transylvania, and the Turkish empire, with the exception of Egypt and Palestine. This would form an empire sufficiently extensive and powerful to need no apology or protection. It might be a suitable successor to the hereditary imperialism of Austria—a legacy from the Cæsars. Constitutional government with autonomy in the Danubian principalities and Poland, with a central counsel meeting at Buda-Pest or Constantinople for the whole Empire, would give that combination of popular and monarchical government which at once protects and secures the rights of nations. The small central states of Europe, Poland, Bohemia, and Hungary, cannot avoid being absorbed by powerful neighbours. Russia in return for the loss of Poland and her German provinces, would find a field for her energies amply wide in Eastern Asia; Tartary, Mongolia, and even China might be civilised by her. France would receive back from Germany Alsace and Lorraine, which would be no longer needed strategically by a people so numerically strong as a united Germany. England would require Egypt to secure her route to India, and justice to the long-oppressed Jewish people demands a restoration to them of Palestine, under the joint protection of England and the great Powers. They might develop the resources of that once-favoured land. Italy would acquire the Italian Tyrol and the island of Cyprus. Greece would acquire Thessaly and a portion of the islands of the Archipelago. This must be brought about, or a conflict of nations against rulers is inevitable. The clock of civilisation would be put back by the triumph of Pan-Sclavonism, but would be put forward by the formation of a South Sclavonic empire under Austria. A Pan-Sclavonic empire could have no permanent existence. The nations of this family are too much alike in duplicity and depravity, to be united except by the fear of an enemy at their door. The dread of Germany on the one hand, and of Russia on the other, could alone give stability to an Empire formed of the nations of Eastern Europe. Let Prince Bismarck and Count Andrassy recognise the rights of the nations they govern, and the interests of

the population of European Turkey, and we shall see Germany directing the external policy and commanding the troops of the German provinces of Austria, which need not lose their internal government or their dynasty, as was the case with Bavaria and Saxony. Austria should dominate the army and foreign policy of Turkey, and protect the Sultan and his Mussulman and Christian subjects, who would be all equal in the eye of the law. This settlement of these great European questions might be done peaceably, at least, as regards Austria and Germany. Russia, the great disturber of the peace of Europe, would be made to pay the penalty. If in a war she lost Poland and her German-speaking provinces, tardy but poetic justice would be done.

Oppression sweeps these lovely plains:
Rise, fellow-men! our country yet remains.

A HUNGARIAN.

London, *Feb.* 1878.

SPONTANEOUS GENERATION AT THE ROYAL SOCIETY.

Seeing dying vegetables life sustain,
And life dissolving vegetate again;
All forms that perish other forms supply.
By turns we catch the vital breath and die. *Pope.*

THERE has been a most interesting series of communications by Professor Tyndall and Dr. Burdon Sanderson, in the Proceedings of the Royal Society. Professor Tyndall took an airing last September on the Alps, and sent Professor Huxley the following letter (Proceedings of the Royal Society, No. 184):—

Alp Lusgen, Sept. 18, 1877.

MY DEAR HUXLEY, — Though the question of "spontaneous generation" is, I believe, practically set at rest for the scientific world, you may possibly deem the following facts of sufficient interest to be communicated to the Royal Society. I brought with me this year to the Alps sixty hermetically-sealed flasks containing infusions of beef and mutton, turnip and cucumber, which had been boiled for five minutes in London and sealed during ebullition. They were packed in sawdust, and when opened at the Bel-Alp the drawn-out and sealed ends of six of them were found broken off. These six flasks were filled with organisms; the remaining ones were pellucid and free from life. Two or three of them were subsequently broken by accident, but for six weeks fifty of the flasks remained perfectly clear. At the end of this time I took twenty-three of them into a shed containing some fresh hay, and there snipped off their sealed ends with a pair of pliers. The air of the hay-loft entered to fill the vacuum produced by the boiling in London. Twenty-seven other flasks were taken immediately afterwards to the edge of a declivity, which might almost be called a precipice, with a fall of about 1,000 feet. A gentle breeze was blowing from the mountains, which were partly snow-covered and partly of bare rock, towards the precipice. Taking care to cleanse my pliers in the flame of a spirit lamp, and to keep my body to leeward of the flasks, I snipped off their sealed ends. The two groups of flasks were then placed in our own little kitchen, where the temperature varied from about 65° to 90° Fahrenheit.

Result.—Twenty-one of the twenty-three flasks opened in the hay-loft are filled with organisms; two of them remain clear.

All the flasks opened on the edge of the precipice remain as clear as distilled water. Not one of them has given way. This is a striking confirmation of the experiments of Pasteur upon the Mer-de-glace.

Ever, my dear Huxley,
Yours faithfully,
JOHN TYNDALL.

From this it appears that the pure air of the Alps is unfavourable to the production of those mysterious organisms which are called bacteria. Professor Tyndall, in his paper entitled "Further Researches on the Development and Vital Re-

sistance of Putrefactive and Infective Organisms, from a Physiological Point of View,"* informs us that—

In the autumn of 1875 and in the winter and spring of 1875-1876 many experiments had been made, and the result communicated to the Royal Society on January 13, 1876, and a memoir was published in vol. 166 of the "Philosophical Transactions." The air in certain "closed chambers" had been permitted to free itself from floating matter; no artificial means of cleansing it had been employed. Sterilised organic liquids and infusions of various kinds were found, when tested by the microscope, free from turbidity and scum and mould, which to the naked eye are infallible signs of the generation and multiplication of such organisms. These experiments comprehended, among others, urine in its natural condition; infusions of mutton, beef, pork, hay, turnip, sole, haddock, codfish, salmon, turbot, other fish, and fowl. Five minutes' boiling was sufficient to sterilise the infusions. As soon as the doors of the chambers were opened, and the uncleansed air of the laboratory entered, the contact of the air, or rather the matter floating in it, produced organisms, bacterial and fungoid.

Infusions of the above substances were afterwards exposed to air, freed of its floating matter by filtration through cotton wool, also to air from which the matter had been freed by calcination, and finally to vacua obtained by exhausting as far as possible, with an air pump, large receivers which had been filled with filtered air. In these cases none of the infusions showed any alteration of transparency or organisms. These experiments were performed with open test-tubes; afterwards they were done in retort flasks, boiled in heated oil or brine, and sealed during ebullition. When carefully performed, they did not afterwards indicate any sign of organisms, but remained quite clear.

Drinking-water may be much contaminated without having any smell or taste to indicate it, and may thus, even when seemingly pure, be very unwholesome and cause disease. Experiment has shown that organisms or germs, when surrounded by fresh organic matter, are inocuous, but if fermentation take place they become deleterious. Even chemical analysis fails to discriminate between these minute living or dead germs. "The microscope shows their nature more fully." Dr. J. Dalton Hooker thus describes an experiment: On the perforated bottom of a stoneware vessel he placed some fresh meat which had been previously deprived by heat of any living organisms or germs it contained. The vessel was filled with spongy metallic iron, and after a fortnight was quite fresh. The meat in another vessel was covered with animal charcoal, and resulted in putrefaction. In the first case, he considered that the oxygen of the air was entirely obstructed by the iron from reaching the meat and developing any germs which might have been conveyed in the air which reached it. An experiment was tried without boiling the meat, by merely placing over it spongy iron and water, but the meat became putrid. Our knowledge of those low organisms which are believed to be the cause of epidemics is too imperfect to allow of direct experiments upon them.

Experiments were performed with cheese of various kinds. In some cases the cheese showed signs of organic life, but Professor Tyndall considered that in these instances the sterilisation of the cheese had been in the first instance imperfectly accomplished, and this principle was further illustrated in an experiment in which mustard seeds were tied up in a calico bag, in which position they resisted an amount of heat, which singly would have been more than sufficient to cause sterilisation; and that not merely heat, but the ability to diffuse its juices or salts, must be overcome to destroy any germs of life which might be in the substance. The imperviousness of cheese to water thus explains the result alluded to above.

Experiments with hay attested the same principle. A great difference was found to exist between old dry hay and fresh. But the experiments with hay, succulent vegetable, and other matter did not produce in 1876 the same results as in the previous year, and after much laborious experiment the Professor was led to the conclusion that the atmosphere in which he was working was so contaminated that the sterilisation of objects became almost an impossibility. He forthwith repaired to the purer atmosphere of Kew, where his efforts produced the same results as he had obtained at first. Liquids which in Albemarle Street, when boiled for more than two hours, could not be rendered safe from organic matter, at Kew were rendered perfectly sterile.

Experiments were tried with filtered air, but these were not successful. A greater or less amount of heat seemed necessary to destroy the power of fertilisation, but when this was accomplished, contact with air of greater or less im-

* Proceedings of the Royal Society, vol. xxvi. No. 110.

purity produced a change in the substance, and resulted in organisms, bacterial or fungoid. Some germs resisted an astonishing amount of heat. Professor Tyndall thinks that such germs in an hospital might produce serious results. The fully developed bacterium is killed at 140° Fahrenheit. He considered that progressive heating will accomplish more certain destruction of life than if the same amount of heat were applied continuously. When the liquid had become coated with a "thick film of fatty scum made up of matted bacteria," sometimes the liquid below remained quite clear, and, as Pasteur said, this scum, by intercepting the oxygen of the air, hindered the development of life below. He therefore inferred that could the air be completely removed from infusions, even without boiling, sterilisation would be complete, and the germs, entirely deprived of oxygen, would be killed. "Pasteur has demonstrated that alcoholic fermentation depends on the continuance of life without air ; other organisms than torula being also alleged to be competent to live without oxygen."

On November 22, 1877, Dr. Burdon Sanderson read a paper before the Royal Society "On the Attributes of Germinal Particles of Bacteria," quoting the words of Pasteur's well-known memoir, "Sur les Corpuscules Organisés qui existent dans l'Atmosphère."

"There exist in air a variable number of corpuscles, of which the form and structure indicate that they are organised. Their dimensions increase from extremely small diameters to 1-100th of a millimètre or more. Some are spherical, some are ovoid, some are translucent, some are opaque with granulations in the interior. I do not think it possible to say that one of these corpuscles is a spore ; still less that it is an egg of a particular microphyte or a microzoon. I confine myself to the declaration that the corpuscles are organised, that they resemble in every respect the germs of the lower organisms, and they differ so much in volume and structure that they unquestionably belong to very numerous species." These were the views of Pasteur and most well-informed persons up to 1870.

Dr. Sanderson said the ova of the elephant and the mouse were alike, that there was no known means of distinguishing them. Speaking of bacteria, Dr. S. says, "The experimental evidence before us proves that in all cases in which bacteria appear to originate *de novo*, that is to say, in liquids which are at the moment of their origin free from living bacteria." In 1871 he proved "that all exposed aqueous fluids, even when free from visible particles and all moist surfaces, are contaminated, and exhibit a power of communicating their contamination to other liquids." He said he knew nothing of the mode of development of these particles, and that they are so small as to be beyond the reach of observation.

Even the simplest instances he could mention, namely, the elevation of dead albumen into living (the earliest stage in development), was at present beyond the reach of investigation. Professor Tyndall, he said, blamed him for incautiously vouching for the fact, from an experiment performed by Dr. Bastian, "that in boiled and hermetically sealed flasks bacteria sometimes appear in swarms." To test this, Dr. Sanderson himself boiled a neutralised infusion of turnip, to which had been added a pinch of pounded cheese, and when it was boiling sealed the flask hermetically. Sometimes this produced bacteria and sometimes not. (Was the boiling imperfect when it did?) Dr. Sanderson thought the turnip-cheese experiment a failure. It was proved that the germinal particles of bacteria can stand a temperature of 100 centrigrade for five or ten minutes, but are destroyed by a temperature of from 103 to 110 centrigrade.

Dr. H. Fownes and Mr. Thomas Blunt proved (Paper on the Effects of Light on Bacteria, Royal Society, December 6, 1877) that light is unfavourable to the production of bacteria, and under favourable conditions prevents its development.

The corollary from this discussion leaves us at the point where we were before the discussion was commenced, namely, we are unable to prove spontaneous generation, but all the evidence on which we can rely brings us to a point involving the hereditary descent of organisms and a first cause. The axiom "nothing can come of nothing" is more than ever forcible.

The practical utility of these researches is chiefly as tending to show the causes necessary for the existence and perpetuation of the low forms of life, which may be the occasion of disease, and are the accompaniments of putrefaction in organisms. The scientific study of this subject is of great importance to the fever-hospital doctor, the student of sanitary science, and the preparer of preserved provisions, as well as every householder who inquires why his food has so suddenly become decomposed and unwholesome. To the speculative philosopher it is a most important question, and one on which depends the whole doctrine of evolution. For if the question of the origin of even the lowest and simplest forms of life is inscrutable, surely we should not be

surprised if there is no biological evidence to show the origin of higher life. The materials which chemistry analyses as the contents of organisms are dead and useless without the influence of a spirit to invoke them out of the dust of the ground. To this point have these researches led, and here they seem likely to stop. Nothing more has been substantially discovered since the researches of Pasteur; and the imperfectly performed experiments which seemed to prove spontaneous generation, and which shook the faith of some in creation are set at rest.

"Thus when the lamp which lighted the traveller at first goes out,
He feels awhile benighted, and looks around in fear and doubt;
But soon the prospect clearing, by cloudless starlight on he treads,
And thinks no lamp so cheering as that light which Heaven sheds."

THE QUARTERLY JOURNAL OF THE GEOLOGICAL SOCIETY.

THE "Quarterly Journal of the Geological Society," issued November 1, 1877, contains a larger number of papers than usual. The first is "On the Upper Limit of the Marine Carboniferous Beds of Britain and the Continent." This is an able paper, which goes over new ground as regards correlation: this is the gist of the paper; paleontology is secondary. Mr. Charles Gallaway's paper, "On a New Area of Upper Cambrian Rocks in South Shropshire," describes strata almost new, and gives a plate of new trilobites. Mr. R. L. Jack and Mr. John Horne's paper, "On the Glacial Drift of the Northern Carpathians," provoked no discussion and is very short. Professor Owen's paper, "On the Rank and Affinities of the Reptilian Class of the Mosasauridæ," is an exclusively paleontological paper entering into much detail. The same remarks apply to Professor Seeley's paper, "On the Pliosaurus Evansi." Professor Boyd Dawkins' paper, "On the Exploration of the Osseous Deposit at Windy Knoll, Castleton, Derbyshire," is a short paper on mammalian remains found there. Mr. D. McIntosh's paper, "On New Sections near the Estuary of the Dee, bearing on the Origin of Boulder Clay," enters into little detail. Mr. Robert Mallett's paper, "On the Piling up of Volcanic Cones," is a useful contribution to the literature of an important subject. Mr. E. Gilpin's "Notes on the Recent Discovery of Copper in Nova Scotia," are scanty, but accompanied by a map of the mining district. The Rev. E. Hill and the Rev. E. Bonney's paper, "On the Pre-Carboniferous Rocks of Charnwood Forest," is a useful communication on structural geology. Mr. W. J. Solass, "On the Genus Siphonia," is a highly important paleontological paper, well illustrated. Dr. J. W. Dalton's "Note on a Specimen of Diploxylon from the Coal Formation of Nova Scotia," is illustrated with sections. Mr. Thos. Belt, "On the Steppes of Southern Russia," like most papers on Russian geology by Englishmen, is founded on but scanty material. It contains lists of fresh-water shells, but the whole subject requires more elaboration. Mr. E. Etheridge, junior, "On the Occurrence of a Macrurous Decapod in the Lowest Red Sandstone of Carboniferous Formation in South-East Scotland," is an important paleontological paper on a fossil lobster. Mr. J. E. Dunn's "Notes on the Diamond Fields of South Africa, and on the Gold Fields and Cobalt Mine in Transvaal," are extremely short. The Rev. T. G. Bonney's paper, "On the

Serpentine and Associated Rocks of the Lizard District," with "Notes on their Chemical Composition," by Mr. W. H. Huddlestone, is a useful mineralogical paper. It is interesting to observe oxide of nickel as a constituent of the black serpentine. Professor John Milne, "On the Action of Coast Ice on an Oscillating Area," is very brief, as is also Mr. H. K. Jordan's paper "On Coal Pebbles and their Derivation."

This number abounds in useful material for the student, but contains no discovery of a sensational character.

THE GROSVENOR GALLERY WINTER EXHIBITION OF DRAWINGS BY OLD MASTERS, &c.

THIS Exhibition contains many works of great interest—drawings in all degrees of finish, and water-colour paintings. Of those by John Constable, No. 4, "Stonehenge," is one of the most remarkable. The drawing is bold, but the sky is too blue, as it has not received those finishing touches which the artist would have given had he intended it for exhibition. 6, "The Cottage in Sussex," is a little gem, very characteristic of the artist. 9, "Old Sarum, the pomp of kings, is now the shepherd's humble pride," abounds in rich colouring, but is unfinished. 14, "Ely," by George Fennell Robson, is a splendid drawing, worthy of a great artist; the light is well managed, and the grouping of the cattle in the meadow is skilful. 23, "A Vision," by Stephen Francis Rigand, has a William-Blake-like look about it, but is more soft than is general in the works of this master. How very natural is 27, "A Squall," by Samuel Owen, a work worthy of Clarkson Stanfield; so great is the reality of the painting, that one feels alarm as he looks down on the receding waves. 41, "Castle Gondolfo," by George Robert Cozens, is a terribly grand landscape. There are many fine Cattermoles in the collection. The finest is 42, "The Baron's Hall;" it has an aspect of aristocratic grandeur in which this painter so much delighted, and which in his own mode of treatment was unsurpassed. With him buildings and their still life, and the light and shade which belong to them, were the most prominent points of observation; the human and animal life had the second place. He was the greatest possible contrast to David Cox, who might be called the Constable of the present day. 55, "A Lane Scene," by Cox, is characterised by a bold style of sketching the trees and clouds, more natural than Constable's work generally is. 59, "A Stream," with magpies on a fence, is pretty; but 80, "The Green Lanes of Staffordshire," is a gem of this painter, a picture refreshing to the eye, and one which excites healthy emotions. 91, "The Skylark," inspires, no doubt, more lofty aspirations in the rustics who are viewing it. It is always pleasing to watch it soar as it sings at "heaven's gate," but it cannot leave the earth from which its subsistence is derived, or remain long in its high position; neither can man when elevated on the wings of his imagination, for he must soon descend to the dull common-places of every-day life. William Turner, of Oxford, was a most skilful painter, as his pictures, 124 and 130, "Lowering Weather" and "After a Storm," are characterised by rich pictorial

effect. One of the works of Copley Fielding is 137, "Fishing Boats," which are surrounded by fine clouds and water, at once natural, beautiful, and suggestive of elevating sentiment. The same may be said of the John Varley, 143, "The Thames at Battersea." 156, by W. Turner, of Oxford, represents Stonehenge in the distance, with sheep dotting the green sward. William Hunt's works are very natural and powerful. "Milking-time" is a mere sketch, but of very high quality. A plain rustic stands with his hand on the back of a cow, a dead peacock on a table; it is worthy of Weenix, but is in water-colour. It is certainly by an ornithologist, from its truthfulness of bird-painting. 200, "Primroses and Orchids," is also surely by a botanist; while 201, "Birds' Nests and Apple Blossoms," is by one who, in the careful desire to reproduce the details of nature, has left nothing unfinished. "The Apples and Peaches," in 202, seem quite fit for dessert. The works of Samuel Prout are very beautiful. He is not so poetical an illustrator as Cattermole, yet is one of the most artistic of topographical artists. 206, "Launceston Castle," is fine, but it has not the interest of such pictures as 210, "Nuremberg," which is a most valuable chronicle of the inner life of Germany. Here numerous market people, clad in picturesque costumes, are ready to cross over a ferry. On either side of the river are lofty gothic buildings. In the background is seen a most beautiful double-arch bridge, crowned by a still more lofty building. "Utrecht," 214, is a picture of similar character. The Rev. T. Raven's painting, "The Sea before the Storm," 238, has a likeness to the works of his son, now exhibiting at the Burlington Fine Arts Club. It is a work that reminds us at once of Rembrandt and De Wint. 241, "A Street at Cookham," by F. W. Walker, shows a flock of geese, driven by a girl through the streets of a country town, which the other figures in the piece do not appear to notice. Sir Edwin Landseer's "Whisky Still," 248, is a Highland scene. An unconvicted felon is there working a private still in fraud of the revenue.

Thae curst horse leeches o' the excise,
Wha mak' the whisky stills their prize,
Haud up thy han', De'il, ance, twice, thrice,
There seize the blinkers,
And bake them up in brunstane pies.
Burns.

J. M. W. Turner's "Oberwesel on the Rhine," 258, is the finest work of his in this gallery. "Stonehenge," 269, is a splendid work; with one bold stroke of a master as much duty is done as by ten strokes of a pupil. Gainsborough is represented by several very characteristic sketches in the bold, coarse manner in which he delighted. Perhaps the most characteristic is 276, "A Landscape, with Cottage." Robert Hills, a capital animal draughtsman, is represented by four natural animal pieces. The denizens of the farmyard, the cattle and the donkeys, all look their best, particularly in 298, where two adult and two young donkeys appear to enjoy life. Alexander Cozen's "Landscape in Sepia," 459, is a very pretty composition. William Payne's "Landscape," 477, is an example of hard painting but good composition. Paul Sandby's "Hyde Park in 1780," during the encampment, is a valuable historical record, but has the hard-coloured print look not uncommon in the drawings of Sandby. The "Portrait of J. M. W. Turner," 513, by Daniel Maclise, seems to be a proof of the error of those who have hastily assumed that there are only two portraits of Turner extant, those in the National Gallery. Besides this one, we have ourselves possessed a fourth, but they were taken by stealth, with

one exception, for the painter, conscious of his plainness, was reluctant to have his features recorded.

The collection of Drawings by Old Masters of the Italian School is very fine, and well worthy of study by collectors. That of Pietro Perugino, a study of a figure of St. John for the fresco in the church of St. Maria Madelina, at Florence, 588, is fine and characteristic. 590, a Papal procession in pen and ink, by Pietro Berretini da Cortona, is an elaborate drawing, showing fine grouping. 596, "The Resurrection," by Giovanni Santi, is a highly finished shaded drawing in bistre, in which Christ is represented as standing on the sepulchre ready to ascend. This collection displays many fine drawings by Raphael; among them, 603, a virgin and child, drawn with a pen, is very graceful. 611, a study for a picture of the resurrection, is a pen drawing of fine composition. The portrait head, 621, and the study of the head of one of the Apostles in the transfiguration, 627, are grand works. Leonardo da Vinci is represented by a number of studies, mostly lent by the Queen. In 807, the half-length figure of a man, is most powerfully drawn, and from its truth to nature might be a portrait perhaps of a patrician of ancient Rome. 808, two studies of grotesques, are splendid caricature distortions of the human face. There are many fine Albert Durers: 806, a composition of eight figures, reminds us of the drawings in his woodcuts. "Two Squirrels," 837, highly finished in water-colours, are most natural and pretty, and appear to have been painted but recently. Such is an example of what the use of permanent tints can do.

THE LINNÆAN SOCIETY.

The Journal of the Linnæan Society for November and January contains the Flora of Morocco, by John Ball. It embraces 711 species, and displays a few uncoloured plates. The Transactions issued in February, 1878, contain a short but important paper with a map, "On the Geographical Distribution of Meliaceæ," by Casimir de Candolle, of Geneva; "New British Lichens," by the Rev. W. A. Leighton, with a coloured plate of fourteen species; and a short paper on "New Irish Lichens," by the same author, with a coloured plate. There is a long report "On the Liliaceæ, Iridaceæ, &c., of Welwitsch's Angolan Herbarium," by J. G. Baker, F.L.S., with several uncoloured plates; also a contribution to the Lichenographia of New Zealand, by Charles Knight, which contains two plates; and a paper on "Some Points of the Morphiology of the Primulaceæ," with plates, by M. T. Masters. In this paper the changes from flower to leaf are described at considerable length. Last year there was a paper by Mr. R. B. Sharpe, "On the Birds of the Philippine Archipelago," illustrated with nine coloured plates of thirteen species; a paper "On Steere's Spunge, a New Genus," by James Murie, M.D., illustrated with plates; "Notes on the Oxytomatous Crustacea," by Edward J. Miers, with plates; "On the Domestic Pig of Pre-historic Times in Britain," by George Rolleston, M.D., illustrated with plates; and "On Two New Forms of Deep-Sea Ascidians, obtained during the Voyage of the Challenger," by H. N. Moseley, M.A., with coloured plate.

SHOULD SCIENCE BE APPLIED TO THE SELECTION OF PARTNERS FOR LIFE?

DURING the past twenty years I have carefully watched about fifty cases, in which science has been applied to the selection of partners for life, and will briefly describe some of the more remarkable cases.

A sound method of estimating the mental and physical characteristics of an individual is necessary at the outset, both to assist the investigator, and to guide those who would be regulated by science rather than by impulse. Physiognomical physiology, based upon the form of the man from head to foot, is the only safe guide.

The man who has the most practical knowledge can best supply it; so let each man who would desire to apply science to the selection of a partner for life, apply the simple signs of character and health which are laid down with great clearness and precision in the works of Combe, Fowler, and Dr. J. Simms, on physiology, physiognomy, and phrenology. Those who have not this rudimentary knowledge are often, from their naturally deficient talent for the discernment of character, most in need of the aid of science in their selections, and let me constrain such to take the best advice they can get before their wedding day.

A valued friend once wrote to me: "You are right. My first marriage was a mistake, a fatal one; no child out of eight lived two months. My wife was a constant invalid, poor in mind and weak in body; but I had not read Combe's works when I saw her. I mistook the flush of the ball-room for the flush of health, and weakness and complaisance for amiability. But all is over now; she and her race are wound up. Come to-morrow with me to Mr. Wells, the phrenologist, and I will hear what he says about my new young lady."

We went accordingly. The young lady was described as having a vigorous constitution, a sympathising nature, and an intellectual character, of activity and power. I asked Mr. Wells, when the principals had withdrawn, whether he thought, from his experience, that they were suited to one another, and whether an alliance would be prudent. Mr. Wells thought it would, and that not one couple in a hundred were so well matched. Five fine and healthy children were the result of the union of these parties, who, though all under nine years of age, promise remarkably well. The father having been killed by an accident, and leaving his wife unprovided for, the good constitution and energetic character of the mother have come to be developed to a high degree of strength and activity, since by that alone can she hope to maintain and educate her family. Although poverty seems her prospect, she prefers it and the care of her children to a second alliance with a rich man with a villanously low forehead.

Mrs. K. was of a large frame, powerful in mind and body. Her aspect and qualities were noble, and had she been united to one suitable to her she might have been happy; but at eighteen she unfortunately married a shallow, conceited, profligate man, whose head was two inches less in circumference than hers. She was the mother of eight children, all inclined to thieving, lying, and other forms of depravity. After being tormented by her husband and children for twenty-one years, she was glad to hide herself from all

of them, by emigrating under an assumed name. She frequently expressed to me her belief that had she married a man of high endowments, or remained single, she would have had a splendid and honourable career, and she conjured all the young people she knew to be guided by science rather than by passion, for passion could only induce a shipwreck of their lives.

T. is a woman of large size, vigorous intellect, and considerable cultivation. She married a man of very poor intellect, but tolerably good character. They have eight boys and one girl. The girl resembles the mother, the boys the father. Every boy is below mediocrity in everything but impudence.

P. R., becoming early a reader of works on physiology and phrenology, determined to take a wife in accordance with the precepts which he had learned, and so he found without much difficulty one who, although of birth somewhat beneath him, yet was his equal in education and of a harmonious temper. They have had no offspring, but their marriage has been so happy and helpful that they combine in the authorship of books.

B. W., a young gentleman, and successful gold digger in Australia, did not succeed in finding a suitable partner there, so came to Europe. Consenting to be guided by physiognomy, he could not for some time find a partner at all suited to him among his circle of acquaintances. He finally applied to a phrenologist residing in Bristol, to introduce him to a suitable young lady, which being done, he in a fortnight wooed, won, and wedded her, and started for Australia, for his sheep farm could not be left any longer. The phrenologist had a letter from him three years after, saying that he was most happy, had two children, and was thankful that science rather than passion had regulated his choice.

Miss C., being courted by a man of high character and attainments, would not finally accept him until she got the opinion of a phrenologist on his moral organisation, which being pronounced favourable she married him. She had many trials in the sickliness and early death of many of her children; for although her mental constitution was fine, yet her bodily frame was weak. Her children were quite patterns for talent and amiability.

L. G., a wrong-headed but in many respects a very superior young woman, who believed in nothing but fancy in these matters, married a man of good position and wealth but of depraved moral constitution. He gave her many rivals, and finally deserted her. Reading and reflection convinced her of the folly of her choice, and she has been known to say that if she is ever free, she will take science as her guide in her second choice.

A. Y., a professional man, has had three wives. The first two marriages were complete failures; the third, regulated by science, is a success.

I have prepared a table of the fifty cases which I have spoken of as having fallen under my observation, where science has been applied, and in forty-five cases it has been a complete success in the production of fine and promising offspring. In two cases they have been wanting; in three the marriage has been cut short by death. I have thought it better thus to summarise the results rather than to detail the incidents of each case at length, which some might think characterised by a wearisome sameness.

TABLE CONSTRUCTED TO SHOW THE BENEFITS OF MARRIAGE IN ACCORDANCE WITH THE TEACHING OF PHYSIOLOGY AND PHYSIOGNOMY.

Initials.		Health of Male at Marriage.	Age.	Health of Female at Marriage.	Age.	Date of Marriage.	Offspring.	Year when last heard of.
Male.	Female.							
M. B.	C. C.	Strong	24	Healthy but susceptible	28	1856	4 girls, 2 boys, healthy	1874
A. W.	C. G.	Sensitive but healthy	32	Very robust	24	1857	5 boys, 2 girls, strong	1874
G. W.	G. D.	Powerful in mind and body	27	Strong	21	1856	8 boys, 2 girls, strong but one	1874
F. W.	J. G. K.	Delicate but healthy	28	Very robust	21	1857	4 boys, one died, 3 delicate but healthy.	1873
S. T. G.	K. M. T.	Healthy	30	Healthy but sensitive	27	1856	5 boys, 3 girls, healthy, one dead.	1874
A. G. L.	J. K. G.	Healthy	45	Healthy	31	1858	3 girls, healthy	1873
L. B.	M. S. B.	Healthy	50	Healthy	34	1860	Boy and girl, healthy	1872
F. K. H.	E. S.	Healthy	60	Healthy	40	1856*	2 girls, 1 boy, healthy	1872
H. M. S.	E. J.	Very robust	51	Very strong	29	1856	7 boys, 3 girls, all living, healthy	1875
J. F. N.	B. S.	Delicate but healthy	54	Strong	38	1856	2 girls, healthy	1875
M. B. J.	W. L.	Strong	51	Strong	20	1856	5 boys, 6 girls	1875
F. S. D.	M. F. J.	Strong	23	Healthy	19	1855	6 boys, 1 girl	1875
J. K.	B. Y.	Strong	34	Healthy	21	1856	3 boys, 2 girls	1875
L. B.	J. F.	Strong	20	Very strong	22	1855	8 children	1875
S. S.	M. Y.	Healthy	30	Very strong	28	1857	6 children, healthy	1874
O. R.	F. J.	Healthy	20	Strong	28	1857	4 very handsome girls	1875
F. W. B.	S. E.	Healthy	24	Strong	21	1855	4 fine sons	1874
S. T.	L. R.	Delicate	28	Strong	25	1854	4 boys, 2 girls	1875
T. D.	S. J. G.	Strong	24	Strong	23	1857	3 boys	1875
I. M. W.	M. L. C.	Strong	28	Strong	26	1857	2 boys, 1 girl	1873
M. L.	J. P.	Strong	29	Strong	25	1856	1 boy	1873
P. S.	K. M. P.	Strong	30	Strong	30	1855	3 girls	1874
S. P. B.	S. F. J.	Strong	24	Strong	30	1857	2 girls	1875
S. F. P.	B. W. S.	Strong	27	Strong	23	1855	5 healthy children	1875

* Both married before.

TABLE CONSTRUCTED TO SHOW THE BENEFITS OF MARRIAGE, ETC.—*continued.*

Initials.		Health of Male at Marriage.	Age.	Health of Female at Marriage.	Age.	Date of Marriage.	Offspring.	Year when last heard of.
Male.	Female.							
J. S. H.* ...	G. R. P. ...	Strong	25	Strong	23	1855	4 healthy children	1874
S. M. W. ...	M. P. J. ...	Strong	28	Strong	21	1855	4 strong boys	1874
M. B. ...	S. O. ...	Healthy but delicate ...	25	Healthy	21	1857	3 boys, 2 girls, healthy ...	1875
M. N. ...	A. O. ...	Strong	21	Susceptible but healthy	18	1855	6 boys, 4 girls, 2 died, rest healthy.	1875
F. O.	S. B. P. ...	Healthy	34	Healthy	20	1855	6 healthy children	1875
S. B. F. ...	M. P. ...	Healthy	30	Healthy	29	1855	7 healthy children	1875
S. E.	W. S. ...	Healthy	31	Healthy	25	1856†	5 healthy children	1875
J. M. S. ...	M. S. A. ...	Healthy	34	Healthy	24	1857	4 healthy children	1873
J. K. L. ...	J. C. C. ...	Healthy	30	Healthy	31	1855	3 healthy children	1875
A. N. S. ...	C. G. R. ...	Healthy	25	Healthy	19	1855	4 healthy children	1875
A. G. B. ...	S. G. R. ...	Healthy	28	Healthy	18	1855	10 healthy children	1875
A. J.	S. B. ...	Healthy	22	Healthy	18	1854	6 boys, 6 girls, healthy ...	1875
F. H. ...	N. B. ...	Healthy	24	Healthy	17	1856	5 strong boys...	1875
J. W. B. ..	F. S. B. ..	Healthy	25	Healthy	18	1855	8 strong children	1875
F. J. H. ...	E. S. H. ...	Healthy	25	Healthy	24	1855	7 strong children	1875
S. O. H. ...	F. E. W. ...	Healthy	24	Healthy	22	1855	5 strong children	1875
G. H. B. ...	M. S. ...	Healthy	27	Healthy	25	1855	6 strong children	1875
S. N. O. ...	F. H. ...	Healthy	22	Healthy	20	1855	7 strong children	1875
F. N.	G. K. ...	Healthy	21	Healthy	21	1856	8 strong children	1875
C. S. P. ...	A. H. ...	Healthy	25	Healthy	21	1856	3 strong boys, 2 girls	1875
F. Y. C. ...	L. A. ...	Healthy	24	Healthy	22	1855	2 strong boys...	1875
A. S. W. ...	J. A. ...	Healthy	28	Healthy	21	1856	No children	1874
R. J. S.‡ ...	F. W. ...	Healthy	28	Healthy	24	1855	1 child	1875
F. S. K. ...	L. S. B. ...	Healthy	28	Healthy	21	1856	No children	1875
J. J. B. ...	J. S. ...	Healthy	25	Healthy	24	1856	4 boys, 3 girls, strong... ...	1874
J. R. S. ...	J. C. H. ...	Healthy	24	Healthy	21	1855	3 boys, 2 girls	1875
F. K.	A. N. ...	Healthy	23	Healthy	19	1857	2 boys, 2 girls, strong... ...	1875
A. M. B. ...	J. G. G. ...	Healthy	28	Healthy	24	1855	4 boys, 2 girls	1875

* Died in 1870.

† Mother died in 1866.

‡ Died in 1860.

An essential to the success of an alliance is harmony of mind and body between those forming it. It is a common remark that those possessing opposite qualities are found to agree best. This is not, however, quite the correct view, for although identity of qualities in all respects is not at all necessary or conducive to happiness, yet a common ground of agreement in many is certainly necessary. The man of literary cultivation and occupation should seek a wife whose mental endowments fit her to appreciate in some degree his labours. The more intelligent she is, the better for him, as long as she does not stand in his way by any impertinent competition in mental effort. Likewise, the woman distinguished as a brain-worker, be it in art, literature, or science, should seek a partner who will sympathise with her sufficiently to encourage and assist her in her pursuits. "Women of mind" frequently complain of the hindrance they meet with in their pursuits from husbands of coarse habits, whom they have married in early life, and who are made to bear the blame of the fruitless career of wives who, judging from their natural endowments, seem capable of producing shining specimens of work in literature and art. Should the woman follow her mental tendency in opposition to the sympathies of her husband to the extent of producing any work worth notice, she is apt to be esteemed unamiable by her husband. Hence comes the necessity of a harmonious choice, if happiness is to be attained in married life. In the space at our disposal, it is impossible to dwell on the minute traits which mutually attract and repel. Exciting influences on the lower propensities, such as music, dancing, and the liberal use of stimulating food and drink, are hurtful. Such induce alliances which healthier influences and more intellectual pursuits would render t a s teful. After a careful study of a large number of cases of unhappy married life amongst persons celebrated for their mental wealth, I have found that two-thirds of them were attributable to a choice induced by excitements of an unhealthy character. The majority of the remaining third might fairly be laid to a deficiency of those qualities which most tend to make home happy and which are frequently found weak in those conspicuous for intellectual endowment. Such an individual requires to be doubly careful in choosing a partner. A woman having these deficiences, in my opinion, should not marry at all, considering that home is preeminently the stronghold of woman, but should pursue her career alone. The man thus weakly endowed may possibly meet with a woman sufficiently sympathising and unselfish to make for him a happy home, and increase in him those amiable traits in which he is naturally deficient. There have been women in all past ages able and willing to undertake such a task, and they are not extinct.

I have in former years made tables of the relative proportion of qualities suitable to partners for life, founded on the observation of happy and successful marriages. I have not space here to give such diagnoses. The intermarriage of relatives presumably more or less alike in mind and body, tends to the intensification of qualities in the offspring. Now, intensification in emotion is apt to produce nervousness, mania, and disease. Should both parents be small in the region of the heart, for instance, the offspring may be too feebly developed in this important organ. When the heart is large in both, it may be too large in the offspring for health.

Absent-mindedness, short-sightness, asthmatical and other tendencies in parents related, are apt to appear in an increased degree in

their children. Hence on the whole it appears desirable, if a broad line is laid down, to discourage the intermarriage of the relatives, although from carefully prepared statistical tables the result of such marriage is not so bad as some would have us believe. There should be no objection to a man marrying his first cousin, provided there is sufficient oppositeness and harmony between their mental and bodily conditions.

The experience of those who breed horses and cattle is certainly in favour of judicious alliances between those related, provided that the parents possess the qualities which they especially desire to perpetuate, in a higher degree than those not related. This may afford mankind a lesson.

DYSPEPSIA CURED BY CITRIC ACID.

ALLOPATHIC and homœopathic treatment had failed to cure my ten years' dyspepsia. Doctors said that vegetable acids would aggravate my complaint, as I was suffering from acidity, but I should take carbonate of soda and ammonia—alkalis. My inclination for vegetable acids was, however, so strong that at last I took lemon juice with every meal, a total of from one to two ounces daily. In three months I was cured of my dyspepsia. Being anxious to make my remedy useful, I tried it on a few fellow-sufferers, and give results.

Mr. S., a schoolmaster, seven years afflicted, was cured in twelve days. Mr. O., for four years, cured in six weeks. Mr. F. A., eighteen years a sufferer, cured in nine weeks. Mrs. A. S., for six years, complicated with disorder of the liver, emaciated, and sallow, was restored to health and clear complexion in seven months. Mr. B. W., aged 60, suffering from dyspepsia and disorders of liver, bladder, and kidneys, was cured in two years, after having been pronounced incurable by Sir Benjamin Brodie and others, who recommended him to avoid acids. Mr. E. B. was cured of headaches, neuralgia, and dyspepsia in four months; G. B., of dyspepsia in ten days. E. Z., aged 50, twenty years a sufferer from dyspepsia and enlarged liver was cured in ten months by the juice of about 200 lemons. Miss J. Z. was cured of the same in three months. Mr. A. N. was cured of thirteen years' dyspepsia in eleven months. Forty other cases of dyspepsia and disordered viscera have been cured by the use of the same means. Citric acid, the concentrated preparation of lemon juice is cheaper, more portable, and equally efficacious as fresh lemons, juice, and pleasantter than preserved juice. When using the lemons, skin them before they are squeezed. Avoid diluting with water or eating sugar with the lemon juice, for the saccharine matter exhausts the strength of the digestive acids of the stomach. The introduction of citric acid into the body probably favours the development of the gastric juice. Critic acid and pepsine are ferments not of the hurtful nature of yeast, but such as the body requires. Hence the folly of neutralising the acids of the body with alkali, for the body requires free acids for the proper digestion of the food. In the cases given the sufferers generally adopted a farinaceous, frugivorous, and vegetable diet, as twice the quantity of lemon was required on the flesh diet they were accustomed to. The essential oil of lemons contained in the skin is injurious. These observations extend over twenty years.

C. O. G. NAPIER.

THE CHEMICAL SOCIETY.

THE Journal of the Chemical Society for November and December 1877, and January 1878, contains the following papers, which are all very technical and almost incapable of being abstracted :—

1. On "Narcotine," &c., by C. R. A. Wright, D.Sc., a long, important paper.

2. "Note on Otto of Limes," by Chas. H. Piesse and C. R. A. Wright. This otto was procured by rubbing the fruit against a metal rasp, by which pulp was obtained, which was squeezed in a press and purified by filtration. This was quite distinct from otto of lemon. Experiments are described testing its properties.

3. "On the Action of Volatile Metallic Chlorides at High Temperatures, on certain Hydrocarbons," by Watson Smith, an able paper.

4. A long series of abstracts of foreign chemical papers.

5. On the "Oxidation of Ditolyl," by Thos. Carnelley.

6. On "Hydrocarbons obtained from the Homologues of Cinnamic Acid," &c., by W. H. Perkin, F.R.S. This gives the result of experiments on methylparoxyphenylacrylic acid, parallylanisoïl, and methylparoxyphenylecrotonic acid, &c.

7. On "Two new Methods of Estimating Bismuth Volumetrically," by MM. Pattison Muir.

8. On the "Volumetric Estimation of Mercury," by Richard V. Tuson and Edmund Neison.

9. First report to Chemical Society, on "Researches on some Points in Chemical Dynamics," by C. R. A. Wright and A. P. Luff. A long paper.

10. On the "Influence exerted by Time and Mass in Reactions in which soluble Salts are produced."

11. Charles T. Kingszett, on "Cocoa Butter."

12. "Nitrification," by Robert Warrington. A highly interesting paper, as explaining the formation of nitrates in the soil.

13. On the "Gas of the Grotto del Cane," by T. Graham Young. The gas contained—

CO_2	61·50	71·00	residual air.	
O	7·80	5·80	20·25	20·20
N	30·70	23·20	79·75	80·80
	100·00	100·00	100·00	100·00

The dogs which frequently inhaled this gas had to be killed at the end of six months.

ON PYRETHRUM ROSEUM, A CURE FOR CATARRH.

THIS beautiful red-flowered camomile, which when ground is the Persian insect-powder of the shops, flourishes in Persia, Palestine, and the Caucasus. The natives of this mountain chain gather it on the slopes of the hills, where it grows wild, and dry it. It comes to London in considerable quantities, and sells wholesale for about 10d. a pound. But the greed of the retail dealers causes them to charge from 12s. to 20s. per pound. It is invaluable as a means of ridding houses of insect pests without danger to higher animals. The fine dust enters their breathing organs and occasions asphyxia. But on higher animals it acts only as a stimulant of mucous membranes. I have several times in my own person observed that colds were cured by inhaling a very small quantity of this powder. It has been successful with ten other persons in checking cold in the head in its early stage. It is a substance of such remarkable properties as to be well worthy the attention of scientific medical men.

C. O. G. N.

EVOLUTION AND NATURAL SELECTION NOT FOUNDED ON FACT.

BY C. O. GROOM NAPIER, F.G.S.

(ON BEHALF OF THE BURLINGTON HOUSE DEBATING ASSOCIATION.)*

Read before the Psychological Society of Great Britain, 11, Chandos Street, Cavendish Square, on March 21, and April 4, Mr. Serjeant Cox, President, in the Chair.

THE recent discussion of the question of Bacteria before the Royal and Linnæan Societies in reference to spontaneous generation has made me think that the question might be more fully discussed by those who have not had an opportunity of being present before these societies.

Pasteur, in his well-known "Mémoire sur les Corpuscules Organisés qui existent dans l'Atmosphère," says—

> There exist in air a variable number of corpuscles, of which the form and structure indicate that they are organised; their dimensions increase from extremely small diameters to 1-100th of a millimètre or more. Some are spherical, some are ovoid, some are translucent, some opaque with granulations in the interior. I do not think it possible to say that one of these corpuscles is a spore, still less that it is an egg of a particular microphyte or a microzoon. I confine myself to the declaration that the corpuscles are organised, that they differ so much in volume and structure that they unquestionably belong to very numerous species.

Dr. Burdon Sanderson read a paper before the Royal Society on September 22, 1877. After quoting these words, he said that all exposed aqueous liquids, even when free from visible particles, and all moist surfaces are contaminated, and exhibit a power of communicating their contamination to other liquids; but the result of his experiments and those of Professor Tyndall tended to prove that these organisms could not originate in sterilised infusions contained in flasks without contact with the air; Professor Tyndall declaring emphatically that the question of spontaneous generation was set at rest for ever.

If it be true that we have not been able to determine the origin of such a simple organism as bacteria—the beginning of life—surely we are unreasonable if we attempt, by the theory of evolution or natural selection, to account for the origin of species, since we cannot account for the origin of the lowest weight in the scale of life. If we briefly survey the history of the theory of development—a word which has been often used to express evolution and natural selection—we find that in 1801 Lamarck, in the introduction to his "Histoire Naturelle des Animaux sans Vertébrés," holds the doctrine that all species, including man, are descended from other species, a conclusion to which he was led by the difficulty of determining between species and varieties. He attributed the long neck of the giraffe to its habit of stretching it to feed on the boughs of trees, and maintained that the simple forms of life were spontaneously generated. In 1813 Dr. W. C. Wells read a paper before the Royal Society, in which he applied the principle of natural selection to human life history

* The Burlington House Debating Association aims to bring together for discussion Ladies and Gentlemen of all schools of thought. Advantage is taken of the organization of existing Societies to bring together the leading exponents of the great questions of the day. Secretaries of Societies wishing to promote such discussions should address, Mr. C. O. Groom Napier, Secretary to the Burlington House Debating Association, 18, Elgin Road, St. Peter's Park, W.

In 1844 appeared the anonymous work entitled "The Vestiges of Creation." The author declared that—

> The several series of animated beings, from the simplest and oldest up to the highest and most recent, are, under the Providence of God, the results first of an impulse which has been imparted to the forms of life, advancing them in definite times by generation through grades of organisation, terminating in the highest dicotyledons and vertebrata; these grades being few in number and generally marked by intervals of organic character, which we find to be a practical difficulty in ascertaining affinities: second, of another impulse connected with the vital forces, tending in the course of generations to modify organic structures in accordance with external circumstances, as food, the nature of the habitat, and the meteoric agencies, these being the 'adaptations' of the natural theologian."*

We are led to enquire what is species. We are not justified in giving a definition of forms as species, unless we know their life history. Naturalists have collected plants, shells, and insects in remote countries, or of obscure characteristics in Europe, and after their death, or from mere portions of them, as the shell of the mollusc, the flower of the plant or the shrivelled insect, have taken upon themselves to give names to forms, which, however tempting on the score of convenience as facilitating their study, yet have no more authority than the numbers by which other naturalists would distinguish specimens. I maintain that names given on such slender materials and by those who have never studied the objects in a living state to observe their transformations from the ova to the end of their adult life, to have noticed whether or not they in their breeding are restricted to partners of the name that has been given to them, have no right to settle the question of a single species. The system of classification of organic life bears an analogy to that in human society—classes represent races, orders nations, genera families, species households. We have no right to assume without evidence that we know their genealogical tree. The line of demarcation is most clearly drawn between all species of organisms which are well known, not merely to the learned few who read their descriptions in the transactions of a society, but to the many who come in daily contact with them in a living state. Such are the domestic animals, and the plants, and their wild types which supply our wants, and the cultivated and wild plants which are useful to us. But little evidence for their natural transformation can be obtained, and no evidence that even this transformation is of a permanent character. Sow large-grained wheat in an exposed situation, and it will grow up and produce smaller seed than if planted in a sheltered spot. Trees are dwarfed by unfavourable climatic conditions, as are domestic animals and human races. But there is no evidence to prove that even the lines of species whose life history has been known for one hundred years have ever been broken. The horse and ass, the sheep and the goat, the ape and the man, the cereal grains and timber trees, are still distinct. If hybrids are at any time produced, they say to us, "Thus far we go, and no farther." Dr. Darwin says :—

> I look on the term species as one arbitrarily given, for the sake of convenience, to a set of individuals closely resembling each other, and that it does not essentially differ from the term variety, which is given to less distinct and more fluctuating forms.

The very name species, in French *espèce*, in Latin *species*, is indicative of distinctness. Variety, in French *variété*, in Latin *varietas*, is an opposing term, significant of indefi-

* Quoted from Darwin's "Origin of Species," p. xvi.

niteness. The theory of natural selection therefore begins by a contradiction of terms. It makes all dictionaries wrong, whether in Italian, French, Latin, or English. It upsets the conclusions of ages. Unless we admit at the outset this contradiction of terms, we cannot logically accept the theory of natural selection. Dr. Darwin says—

> I look at varieties which are in any degree more distinct and permanent as steps leading to more strongly marked and more permanent varieties, and these latter leading to a sub-species, and so to species. . . Hence I believe a well-marked variety may be considered an incipient species.

This is pure hypothesis, not borne out by fact. As an instance of the difference between species and variety, there is no better than that of the various domestic breeds of dogs which are fertile between themselves. These are varieties of one species, and the ass and the horse whose offspring is not to be perpetuated are distinct species. This illustration is a proverbial one but conclusive. It takes away the ground entirely from those who would assume the origin of species. For if ages of observation have failed to discover a race of beings between the horse and the ass, surely we have no right to assume that forms are transmutable when we have the evidence of ages that they are distinct. John Hunter, the naturalist, considered that the true distinction of species was to be gathered from their incapacity of propagating with each other, and producing offspring again capable of continuing itself; and Sir Charles Lyell, in adducing his testimony, observes that no proof has been obtained that a true hybrid race can be perpetuated.* Historical evidence is greatly against any change in species. Cuvier, as quoted in Lawrence's lectures on physiology, says—

> I have carefully examined the figures of animals and birds engraven on the numerous obelisks brought from Egypt to ancient Rome. In the general character, which is all that can have been preserved, these representations perfectly resemble the originals, as we now see them. My learned colleague, M. Geoffrey St. Hilaire, collected numerous mummies of animals from the sepulchres and temples of Upper and Lower Egypt. He brought away cats, ibises, birds of prey, dogs, monkeys, crocodiles, and an ox's head embalmed. There is no more difference between these relics and the animals we are now acquainted with than between the human mummies and the skeletons of the present day.

Lawrence concludes his disquisition on the subject thus—

> We may conclude, then, from a general review of the preceding facts, that nature has provided, by the insurmountable barrier of instinctive aversion of sterility in the hybrid offspring, and in the allotment of species to different parts of the earth, against any corruption or change of species in wild animals. We must, therefore, admit, for all the species which we know at present, as sufficiently distinct and constant, a distinct origin and common date.†

Dr. Darwin does not prove, or even try to prove, that species are now changing, as he would have us to believe they did in the ages past. For he is here to face actual facts. As there is no evidence in the present day for the transmutation of species, so those who believe in development have to retire to that remote past of which no record exists, and which is wanting even in those traditions which amongst the savage take the place of history. Surely he is illogical who reasons without evidence; surely no law can be framed, except in relation to the cases it is designed to meet.

Pouchet, an advocate for spontaneous generation, demands an enormous time for the development

* "The Darwinian Theory Examined by a Graduate of Cambridge," p. 16.
† *Ibid.* p. 17

of species. "If species be fixed," says he, "it is in the manner of the sun; we cannot perceive its movement, so little are we in the account of time. It requires thousands of ages, perhaps, to establish a displacement of the sun or a transformation of a species." This is a dogma propounded without any evidence. It has been hitherto assumed, since the days of Bacon at least, and by all wise men before Bacon, that the establishment of a law required not merely a few facts to support it, but a multitude of facts. He who seeks to establish a law unsupported by facts is about as great a waster of his time as the member of Parliament who would produce a Bill for regulating the commerce of the moon. Such an one may be ingenious, but he is surely not a practical legislator, seeing that those for whom he desires to legislate are beyond the reach of the law which he seeks to enact. Sir Charles Lyell, in his "Principles of Geology," drew the following inferences as to species :—

1st. That there is a capacity in all species to accommodate themselves, to a certain extent, to a change of external circumstances, this extent varying greatly, according to the species. 2nd. When the change of situation which they can endure is great, it is usually attended by some modification of the form, colour, size, structure, or other particulars, but the mutations thus superinduced are governed by constant laws, and the capability of so varying form part of the specific character. 3rd. Some acquired peculiarities of form, structure, and instinct are transmissible to the offspring; but these consist of such qualities, and attributes only as are intimately related to the natural wants and propensities of the species. 4th. The entire variation from the original type, which any given change can produce, may usually be effected in a brief period of time, after which no further deviation can be attained by continuing to alter the circumstances, though ever so gradually; indefinite divergence, either in the way of improvement or deviation, being prevented, and the least possible excess beyond the definite limits being fatal to the existence of the individual.

This 4th article is as perfect a denial of the theory of transmutation as words can express.

5th. The intermixture of the distinct species is guarded against by the aversion of the individuals composing them to sexual union, or by the sterility of the male offspring. It does not appear that true hybrid races have ever been perpetuated for several generations, even by the assistance of man; for the cases usually cited relate to the crossing of mules with individuals of pure species and not to the intermixture of hybrid with hybrid. 6th. From the above considerations, it appears that species have a real existence in nature, and that each was endowed *at the time of its creation* with the attributes and organisation by which it is now distinguished.*

Dr. Darwin's scepticism on the subject of species was greatly founded on the difficulty of discriminating between the species of the genera *Rubus*, *Rosa*, and *Hieracium* amongst plants which certainly to the practical naturalist afford great difficulties—and why? Because some authors have named species on slender grounds, while others are inclined to bracket these names together as synonymous. But this merely proves scanty observation in those who gave the first names to the rarer forms of these families of plants. We know little about their life history. Those species most controverted are least known. If we take *Helix nemoralis*, *Hortensis*, and *Hybrida*, we see three shells which the older naturalists considered distinct species, but of which I possess a series which prove identity from the imperceptible gradation of colour and form between them; this justifies one name being given to all. These British shells claim affinity with each other, but with no others: hence, as we know their life-history, having reared them, from the egg in all their stages, and found that, although there was a hereditary descent of

* III. cap. 4.

the colours, yet by intercrossing all the varieties were produced, and that the most opposite varieties combined for the perpetuation of their kind. From this fact we may assume that these helices are one species. *Pecten opercularis*, a common bivalve of our coast, is subject to very great diversity of colour, as are also *Helix polychora* and *Nanina citrina*. *Trophon antiqua* and *Buccinum undatum* are subject to great variation in form; the various species of cyprea to great variety in colour. These distinctions are in the shells only; the animals present no such divergence. And amongst birds the ruff and the various hawks show such a diversity of plumage that an observer who merely studied a few individuals might assume that some of the varieties were distinct species; but this merely would be occasioned by the scantiness of his observation and by his ignorance of the life-history of each species. Oology, or the science of eggs, which I have studied closely for a quarter of a century, has afforded me much evidence in favour of the permanence of type. I have series of the eggs of the black-headed gull, the house sparrow, and the common hen, which show how multitudinous are the varieties of each species, and yet in the result, *i.e.* the adult birds, there is no corresponding association of variety. In the common domestic fowl we see a great variability of plumage, and even a divergence in the number of toes, and yet all combinations of these varieties are fertile. These variations are the result of human contrivance; only three types of our domestic fowls exist in a wild state—*Gallus sonnerati*, *Gallus Bankiva*, *Gallus giganteus*, for *Gallus lanatus*, *Gallus morio*, and *Gallus ecaudatus* appear to be varieties. The various forms of pigeons appear to have sprung from the blue-rock bird, *Columba livia*. None of the fancy breeds are found in a wild state, and they soon lose their characteristics when artificial restraints are removed. The same may be said of the multitudinous forms and colours of the domestic duck, of which the extreme types are the gigantic white Aylesbury and small Rouen breeds. Yet all appear to be derived from the common mallard, *Anas boschas*.

It is an important fact to be borne in mind in the question of ducks that the union of wild types of very divergent so-called species are fertile in their descendants, so that the question arises whether, according to my point of view, the division of species is well-founded; but for the sake of argument, supposing it were clearly established that most of the members of the genus *Anas* and the genus *Anser* were fertile *inter se*, it would merely prove that those had been wrong who had laid down broad lines of distinction between them. The lines are very wide between the great classes of birds. There is no interbreeding between them. The canary and goldfinch may pair, but the mules are rarely fertile with either species, and sterile between themselves. Amongst birds of prey or waders, hybrids do not exist. But among the gallinaceous birds, as the pheasant and the common hen, numerous instances of pairing are known; yet with all our researches we cannot find any evidence of the permanent existence of hybrid races or the establishment of types by hybridisation; therefore all the evidence that can be produced is against the theory of natural selection. If varieties are to be produced it must be through the *unnatural selection* of man. Remove his protecting hand from the dog, the cat, the horse, the pig, the bull, and all extreme types disappear, and are lost in neutral forms or tints—forms approximating, so far as we can ascertain, to the wild types. In the island of Tobago, one of the

lesser Antilles, situated about eleven degrees from the equator, and possessing in consequence a tropical climate and periodically rainfall, the sheep imported from England lose their heavy fleeces in two or three generations, and gain but a scanty covering of wiry hair and short wool. This, my opponents may say, is an argument in favour of natural selection, but it is the reverse, for it was *art* rather than nature that brought the sheep there; means most unnatural. But for the power of accommodating themselves to their different circumstances they probably would not have survived the change of climate. We have no evidence that this type which originated in two or three years is permanent. Fur-bearing animals of the same species are much thicker and heavier in their coats in arctic than in temperate climates.

Embryology is antagonistic to evolution; it restricts evolution to species, for evolution is unknown as regards genera. If in the case of the human embryo there is a likeness to the embryonic stages of some animals, it is but a conclusive argument for the doctrine that man is a microcosm.

There is an apparent series of links forming chains, the vegetable and the animal, in the organic kingdom, but each link appears to have been separately forged, as its genesis is invisible. We see surrounding us high and low forms of life; why then this gradation of links from bacteria to Ranunculaceæ, from the monad to man. It is because all these creatures were formed on the same plan and of one index—MAN, who is the epitome of all, either from the actual resemblance which his physiognomy bears to the animals, or from the likeness all organisms bear to his mental qualities. He is what Paracelsus, Oken, and earlier writers declared him to be—THE MICROCOSM. The various animals by their forms suggest human inventions and appliances even in cases where they are not themselves the useful agents.

The alphabets of all languages, and the Arabic numerals which form the means of communicating the ideas of the civilised man, are derived from natural objects. Some assume them to be borrowed from the constellations as Dammartin, or from the objects these constellations represent, as Boeckh and Young, but this is a far-fetched derivation, seeing that the natural objects of each country are themselves inscribed with the required alphabets and Arabic numerals. I can produce the natural objects which show the complete Hebrew, Greek, and Roman alphabets and Arabic numerals on them, so that I can appeal to them as indisputable facts.

Whether we accept the doctrine of Creation or not, we have still to face a difficulty which is to my mind insurmountable in the origin of species from single pairs or even from small numbers of individuals of a species. What evidence have we that the present species named in our catalogues originated from a few or one primitive source? There is no evidence for it whatever; the foundation for the attempt at this line of logic appears to be entirely due to the superstition that species had their origin from single pairs, a dogma which has no foundation either in history or in science. If we judge of the geologic past by the recent present, we see the animals either living on one another or upon the plants; all are mutually depending, for the plants appear to assimilate the dead animals just as the living animals assimilate the dead plants.

> See dying vegetables life sustain,
> And life dissolving vegetate again;
> All forms that perish other forms supply,
> By turns we catch the vital breath and die.

Although every geologic age is

characterised by predominance of some special form of life, yet side by side animal and plant life existed. If the older Laurentian, Cambrian, and Silurian rocks were favourable to the preservation of the remains of vertebrate animals, I might be able to prove that in the most remote age fish lived on the crustaceans and sea-weeds of their day; still, every geologic fact tends to show that the species lived as they do now, that they passed through the periods of embryo, juvenile and adult life, at any rate, since the commencement of the type.

As we have no facts for the transmutation of the living species we see around us, we have no right to assume that the dead species were transmuted. We are seeking to establish a law without any knowledge of the lives of those for whom we desire to legislate. I say this is unreasonable. Dr. Darwin has declared that paleontology is worthless as regards the support of his theory, but his followers have more recently claimed support from the skeletons of animals allied to the horse,* which have been discovered in Tertiary strata, and which are alleged to afford connecting links in structure between so-called species. If the naturalists of the present day can produce no evidence for the transmutation of the living species of the genus *equus*, be it horse or ass, and are barred by the inseparable barrier of the mule, surely it is unreasonable and utterly unfounded on the evidence derivable from the study of living species to assume transmutation in the past. The advocates of natural selection must remove the donkey from their path before they can proceed. Darwinian, do you not proclaim that the weakest go to the wall? Then, ghost of Balaam, go to the wall. The ass is your master; you are dumb while it speaks. I have purposely abbreviated this paper without entering into hundreds of facts which I have observed or read, tending to establish the permanence of types.

MISS COBBE ON EVOLUTION.

Miss Cobbe has kindly given me her thoughts on Evolution in the following letter—

21st March, 1878.

Dear Sir,—I am quite unqualified to offer an opinion on the subject of spontaneous generation as an observed fact. I think, however, the treatment of the controversy in certain high scientific quarters is a matter on which we are all authorised to express some surprise.

The faith which the weaker brethren like myself would gladly place in the Evolution philosophy is much disturbed by finding that some of the most eminent apostles of the doctrine of the evolution of species look with something like scorn on evolution of organism, and having been driven from their old dictum of *omne vivum ex ova*, maintain the new one of "every cell from a cell," as if it were an axiom of geometry which none but a fool could doubt. Not to speak irreverently, it seems to me that Professor Tyndall for example acts in this matter like his celebrated countryman who sawed off the branch on which he was sitting. The whole structure of the Darwinian philosophy rests on the assumption of an unbroken chain of natural causes, an undisturbed Reign of Law from the era of the "fiery cloud" till to-day; and its claim to be a philosophy, not merely an ingenious theory, is surely this, that it offers a thinkable alternative to the unthinkable dogma of creation by fiat. It enables us, in short, in a certain rough way to conceive how the existing fauna and flora of this planet may have arisen without spasmodic intervention of Deity.

But if we are prohibited on pain of being absurd from attempting to begin at the beginning, and warned that inorganic matter never turns into organic seed, and consequently that some other agency

* Hipparion, hippotherium, palestherium, anoplotherium, paloplotherium.

than we are acquainted with must have been at work between the azoic and protozoic ages, then we seem to have only small mercies to be thankful for when we are instructed how man came from apes, horses from hipparion, birds from reptiles, and vertebrates from invertebrates in that grand epoch when

"At length in the day's high meridian,
The hour of the fulness of time,
Came forth the elect, the Ascidian,
From the conflict of sea and of slime."

As Professor Virchow says, we must assume either *generatio equivoca* or creation *tertium non datur*; must believe in miracles (or as Cavaliere Masserino d'Azeglio called them one day in writing to me, "les causes d'etat celestes." While I earnestly believe in a Supreme Orderer of the world, I am driven to conclude that something like the *generatio equivoca* must take place, though our men of science are not quite clever enough to show us when and how it happens.

Yours truly, dear Sir,

FRANCES POWER COBBE.

PROFESSOR OWEN ON EVOLUTION.

PROFESSOR OWEN has kindly given me in this letter a summary of his researches on Evolution.

Richmond Park, Mortlake,
19th March, 1878.

MY DEAR SIR,—By "Evolution" for or against, the Committee and yourself favour me "by asking a few lines." I presume is meant the hypothesis that organic species come to be by the operation of a secondary law ("Nomogeny") as contradistinguished from an act of primary or special creation (Thaumatogeny).

For my opinion or belief, I may say "conviction," not likely to change at my time of life, I beg respectfully to refer the "Committee" to the work "On the Nature of Limits," 8vo, Van Voorst, 1849, p. 86; to the concluding chapter (xl., vol. iii.) of my "Anatomy of Vertebrates," 8vo, 1868; to my "Anatomy of the King Crab (Limulus)," 4to, 1873, pp. 45, 46; the "Monograph on Mesoic Reptiles," in the volume issued by the Paleontographical Society in 1875.

From these it will be seen that I regard the science of biology to be at the stage in which Copernicus left the science of astronomy when his successors began to explain their discoveries in the "heliocentric hypothesis." The geometric one prevalent prior to Copernicus was, like Thaumatogeny, in accordance with Scripture. But the accession of facts was such as to render their explanation on the mechanism it required too cumbrous. Copernicus suggested the "heliocentric" hypothesis as facilitating explanation. To the obvious objection that all things loose would be whirled off by his supposed rotation of earth on her axis in twenty-four hours, neither Copernicus nor his followers could then meet or reply to. So with Nomogeny. The accumulation of facts in Embryology and Paleontology is such as to make this conception or rational exposition impossible on the miraculous creation of species hypothesis (Thaumatogeny); consequently every young cultivator of biology, as a rule, is a Nomogenist. But "how do you get one species out of another—say a dodo out of a dove? a boschisman out of an ape?" Lamarck has suggested one way of operation of the secondary law; Darwin has eloquently advocated another way. In the case of the dodo, I find the theory of Lamarck applicable. (See my work "On the Dodo (*didus ineptus*)," 4to, 1866, pp. 39, 40.) Remember that even Lord Bacon has his fling at the Copernicans, "those carmen that drive the world about." It seemed to involve, indeed, a contradiction to common sense and experience. But it was an easier way of explaining the movements of the heavenly bodies.

By analogy, therefore, although with Copernicus I must say to the objecting Geocentrist as to loose things sticking to the earth, and to the Thaumatogenist as to raising an ape to a Bushman—I don't know—yet, I believe Nomogeny to be true. Since its adoption as an expository hypothesis, the progress of biology has been as rapid as was that of astronomy after Copernicus. By analogy, biology may expect her Galileo, her Kepler, finally, her Newton, who will demonstrate the way of operation of the secondary law; but some generations have still to work.

RICHARD OWEN.

[The discussion will be continued in the second number by Professor Owen, with special reference to the supposed Evolution of the Birds of New Zealand and Rodriguez, and with a reply to all the arguments.]

BURLINGTON HOUSE.

AUGUST, 1878.

THE TURK AT BRIGHTON.

BRIGHTON affords perhaps better opportunities for studying life and character than any other town in England, for while its size gives facility for showing very varied characteristics, the circumstance of its being a watering place—a fashionable lounge—occasions the display of those natural qualities which, in the multitudinous business of large country towns, or the dull routine of small ones, are repressed. Persons, like cotton goods, may be squeezed abnormally into narrow compass by the bands of straight-laced etiquette; but once cut these ties, and they spread abroad with a snap—slip-slop fashion. The very size of Brighton gives freedom to its visitors, for those little excesses which form the nine days wonder of the village, pass unnoticed among the 130,000 of this town. It is a stimulating place in more ways than one, for the fresh air from the open sea is met by even more invigorating currents from the elevated Downs; while this stimulates the body, the mind receives an equal impulse from the rapid pulsations of the town. It is a busy-idle place, where many people find plenty to do in watching their neighbours, and as the neighbourhood is large, they may find in this way sufficient to fill up the measure of their days,—from seven to seventy. These remarks apply principally to the migratory population of Brighton; the resident is influenced by similar motives, habits, and manners to those of the average of great English towns. With these ideas in my head, after many short visits, I became a constant resident in Brighton.

When the study of human character occupies a large portion of our thoughts, eccentric individuals are sought for with the same enthusiasm with which the naturalist searches for curious insects. The note-book of the student of character is thus as valuable as that of the collecting entomologist. A moderately extensive collection of insects, captured in a single English county, often excites the astonishment of those who have never especially looked for them; and in like manner, a collection of curious characters may induce gaping eyes in the common observer, forgetting that traits are perceived by the microscopical observer, which, when analysed, show features of a conspicuous character. A multitude of little traits, when united, form an extensive pile; the minute scales on the inhabitant of the waters, or on the wing of a butterfly, are scarcely perceptible singly, whatever remarkable effects they produce in the aggregate.

It was two o'clock in the afternoon of an October day that I strolled on the beach. A large number of "Cockneys" were in view, it being Saturday. Lovers

under the shelter of boats were perusing in silent sympathy an exciting novel. Children were constructing *Châteaux en Espagne* in sand, and the adventurous spirits among the adult youth of both sexes were, perhaps a little in defiance of decorum, jumping and running on those massive iron tubes which convey the precious waste of Brighton into the sea, thus defrauding the poor soil of so much hard-earned capital. What occurred, then happened almost every day when the weather was sufficiently mild to entice crowds to the beach. Feeling the wind chilly, I withdrew to a sheltered spot beneath the quay, and seated myself on a broken-down capstan to peruse a newspaper, when I was accosted by an elderly man of oriental aspect.

He wore a blue velvet smoking cap, with gold lace tassel; a light-coloured fur waistcoat with large malachite buttons, and a somewhat shaggy vicuna coat.

"What's the time of day, sir; can you tell me?"

And he offered me a cigar. He had with him a camp-stool, which he opened, and sitting down, entered into conversation. He soon let me know he was a Turk, and a sworn friend to the English. And well he might be, for we were in the midst of the Russian war, for the protection of the Ottoman empire.

"How do you like England?" said I.

"Very much. I've been here seven years, and I should like to live here seventy more. I first came on business, but now I remain for pleasure. The greatest difficulty I have is in making myself understood, especially by the ladies."

I complimented him on his English.

"Ah," said he, "you think but too well of me." And he heaved a sigh, and taking out a large Turkey-red handkerchief, wiped tears from his eyes. This a little surprised me, and I turned the conversation to European travel. He was especially at home in describing Greece, having spent a great part of his early life there, but had visited Spain, Portugal, the Black Sea provinces of Russia, and had spent four years in the Caucasus.

Our conversation was interrupted by a shower of rain, on which he wished me good afternoon, and I pursued my walk homeward.

On one of the finest days in November I again met the Turk on the chain pier. He accosted me cordially, and I accompanied him to an arbour bare of trees, but which afforded some little protection against the cold. I was always full of curiosity about Eastern manners and customs, and especially those of Circassia. In order to inspire confidence in the Turk, I spoke freely on a variety of subjects, some of which deeply interested him, and at last I ventured to introduce Circassia.

"You were four years there, I think you said. The story of your sojourn would be very instructive to me."

The Turk was evidently impressed at my apparent offer of sympathy, for he laid his hand on his heart.

"They were partly happy and partly unhappy years," said he. "I was then a young man, and was full of desire to see the world. My father gave me plenty of travelling money, and I started from Stamboul to spend the summer in the Caucasus. I had arranged to make Tiflis my headquarters, and sent thither a considerable sum of money, equal to £800 sterling. I had not been there above a week when a cousin, somewhat older than myself, arrived from Stamboul, and we agreed to go together into the mountains, to visit some independent chiefs, where we should be likely to furnish ourselves with handsome wives at a cheap rate.

My cousin, who spoke the Circassian language perfectly, had much less money than myself, and I soon saw that he wanted to make a tool of me. We fitted out ourselves like Circassian gentlemen, each having a couple of riding horses, two male servants, and a pack horse. The first night after leaving Tiflis we spent at the house of a wool merchant.

"This man was a widower, and he and his one-eyed daughter—a widow of about forty years of age—alone occupied the house. One of the principal correspondents of this man was a chief, far up in the mountains, whose daughter our host proposed to marry as soon as he could save money enough to pay her dowry. She was renowned for beauty thoughout all the district; but the price set on her—equal to £380 sterling—was deemed very extravagant. The young lady was sixteen, and the old man was sixty. A week's journey brought us to the house of this beauty, who resided with her mother in a fine old wooded valley in the mountains. Her occupation was that of a shepherdess, but her father was the owner of large flocks of sheep and goats. He had three wives, two of whom were old and haggard, while one was blooming, being but 18 years of age, she had been but recently exchanged with a neighbouring chief for one of his elder daughters, and the double wedding of the elderly men had been just celebrated.

"Our host had very commercial ideas of matrimony; according to him, a poor man had no right to marry, and his sole standard of excellence was wealth. He soon found out that I was wealthy, and my cousin comparatively poor, on which he became remarkably cordial to me, and very cold to my cousin. He got my cousin to dismiss his two servants, on the ground that they had been rude to the females of the family, and supplied their place by one of his own, who was in reality a spy.

"I rose one morning very early, to fish in a little stream, and was busy hauling in my prey, when I was startled by the screams of a female, and hastily leaving my hooks I ran in the direction from whence they proceeded. I came to a tree, below which was a Cashmere shawl, and looking to the right and left, I saw two wolves, a mother and her half-grown cub, watching the partly-visible form of a human being. Seeing me approach, a female voice shouted, 'Save me from the wolves!' But I had scarcely time to look out when the great she wolf sprang towards me, and I had to muster all my energies. The sole weapon I had was a small billhook, with which I gave the wolf three slashes on the neck as she sprang three successive times at my throat. She threw me down once, and bit my left hand severely; but at length I beat her off, and she decamped with her cub at a running pace. I now thought of the female in the tree, and, giving her to understand she could come down in safety, I asked her how she had got up there, and who she was. But she spoke not. I bawled my questions to her, but still there was no reply.

"She was almost hid in a very thick evergreen oak, and had not my attention been expressly directed to the spot, I might easily have overlooked her. Curiosity as much as humanity, induced me to ascend the tree, and at about four times my height from the ground, I found her lying in a swoon between two forked branches, which interlaced one another in such a manner, as to give her even in her helpless state, full support. Her clothes were much torn, and her flesh bleeding and lacerated; so that I did not at once recognise our host's daughter—the lovely shepherdess, on whom the high price had been

put. Her head was hanging down and her neck was almost breaking in the hollow fork of the tree; so I knelt down and raised her, and sitting in the fork myself, supported her drooping head, for a full quarter of an hour before she revived and was able to speak. She had been driving her sheep home the evening before, when she was attacked by wolves; two of which were slain by her dog, which was, however, at length overpowered and disabled. The pack rushed towards her, and she swam the stream and reached this tree full three minutes before the wolves, who hesitated some little time before taking to the water. With great difficulty she got up the tree, she scarcely knew how, and had been screaming for help all night; with a pack of hungry wolves below her. Exhausted with fatigue and agitation, she at length fell back unconscious. She still expressed great dread of the wolves and unwillingness to leave her position in the tree, and urged me to go for assistance. 'But,' said I, 'if I leave you and you faint again, you may fall to the ground, and at this height you are very likely to be killed.' On this, my fair companion's courage rallied. 'I will come to the ground and with your help, if need be, face the wolves,' said she. On this Loto—for that was her name, attempted to rise, but could not, having sprained herself severely in getting up the tree. I therefore offered to carry her down on my back, which she was reluctant to at first, but there seemed no other course. I tied her on my back with my turban and scrambled through the branches to the ground, a matter of no ordinary difficulty. One of my arms was crushed against the tree, the hand that the wolf bit was made worse, and Loto's foot was bruised. But once on the ground I released her, she could not stand.

"'I see nothing for it, but to carry you home,' said I, and so the fair Loto was with some difficulty hauled again on my back, and a hard morning's work it was, for she was a tall and stout girl and the road home was rough and longer than from Brighton to Shoreham. However I took three rests, and two long draughts at the brook, which conveniently enough, was seldom lost sight of during our route. The whole population of the village was out in search of the missing beauty, and I found no one in any of the houses to take charge of her. But I left her on her divan. In the course of a couple of hours, her father returned and was overjoyed to find her alive. For more than a dozen of her sheep having been found killed or wounded by the wolves, he thought she too had been their victim.

"Loto was profuse in her expressions of gratitude to me. She embraced her father, and casting her eyes firmly yet fondly on me, she said,

"'To this man I owe my life.'

"My kind host on perceiving that I was bleeding, went and got linen to dress my hand; but it was a full month before I had the use of it.

"You may easily fancy, sir, after this little episode, that Loto and I found frequent opportunities for coming together. The manners of that part of the country were more simple than among us Osmanli. Young men and maidens would often meet and take walks, and love matches were common, I soon arranged terms for Loto. In recompence for having saved her life, my kind host abated her price by one half, and being an impatient youth I urged on the wedding, which took place about three months after I entered his house. I felt wealthy in the affection of my Loto. No man ever had such a wife; she was so beautifully formed; her hair auburn; her feet small, and oh, what blue eyes!

They were like the finest Persian turquoises thrown into the sea. Yes, and by Allah they were. And the poor Turk wiped his eyes.

"When we had been married six weeks I went to Tiflis to get some money to fit out my wife and self for our journey to Constantinople. I did my business, and had got about four miles out of Tiflis, when I was attacked by robbers, who knocked me down senseless. When I recovered I found myself gagged, bound, and blindfold, galloping at a furious rate I knew not where. For at least one whole day I rode without stopping. When we did stop I was assisted to dismount, and the bandage being taken from my eyes, I found it was night. My hands and legs were released, but only to be chained with brass fetters. I suffered very greatly during two months wandering in the mountains. I was at last sold as a slave to a chief, who used me very cruelly. He used to flog me until the skin on my back was torn to shreds, and then rub gunpowder over it. But, Allah be praised, I was not to be his slave all my life. My master had a young but very ugly wife, who had fallen in love with one of the other slaves, and fearing that her passion would be discovered, she resolved to slay her husband. The slave told me of the plot, and he agreed to make for our master a draught of thorn apple and poppy juice, which would probably stupify him for several days, during which time we could do what we liked. At noon on the appointed day the draught was given to the old man by his wife, and he was soon quite unable to attend to business. While the other slave was busy in the apartments of the wife, I was fitting myself out in my master's best apparel, and providing myself with the arms and money necessary for a long journey. I will not weary you with a narrative of my escape. I embraced my wife after an absence of nearly four years. She placed in my arms a son of three years old. They had given me up for lost, and my father-in-law was nearly giving my wife to another, in consideration of a large sum, contrary to her protestations. My father-in-law was not at all pleased at seeing me, for the money for his daughter's second marriage had been paid. The old man's manner was so threatening that I thought it prudent to pack up my things and put my wife and myself on asses.

"The first night we encamped out of doors, and looked not at all unlike some of your Christian pictures of 'The flight into Egypt.'

"My father received me at Stamboul with great joy, and got me an important government post at Adrianople, whither my wife and I went. We passed six years in great happiness.

"My situation being lucrative, I kept up a magnificent establishment, and was eagerly on the look out for a handsome youth to be my personal attendant. I purchased a splendid young man, lately arrived from the Caucasus. He quickly gained my confidence; I trusted him; I loved him; I made up my mind to give him his freedom; to make him the steward of my house and give him one of my daughters in marriage. But in the midst of these thoughts I was called away on the Sultan's business to Cairo, and was absent six months. I returned sooner than was expected, and entering the apartment of my wife suddenly, I beheld my trusted Circassian servant sitting beside her on the divan. I tore my turban and beard in rage, and seizing my sword I cut the throat of the traitor, and knew that before the new moon my faithless wife, in accordance with Mahommedan law, must die. But she was speechless and unconscious. This confirmed me in my belief in her guilt. For a fortnight she raved, frequently mentioning the name of the traitor. My grief was desperate; it was even

greater than my rage. Loto had a powerful sleeping draught, and was taken a drive in her Araba to the banks of the river Maritza. She was put in a sack weighted with large bags of shot, and carried to the river's brink. The night was particularly dark, and all the sounds that were heard as her bearer struggled with his burden to the brink, was the howl of a wild dog and the roar of the waters. He was half inclined to spring in himself, but the water felt so cold." (The Turk here stopped and hung his head down).

The Turk noticed my emotion and said—"You shudder at this, but you cannot do so as much as I do. I have wandered about seeking rest and finding none. I have laid my burden at the foot of the Cross, and have renounced the crescent. I hope soon to be baptized. I was deceived, the victim of a delusion; one of 'Sheitan's' own. For horror of horrors, my faithful slave was the twin brother of my darling Loto. This, one of the degenerate reptiles of my harem afterwards confessed."

I felt deeply interested in the Turk's narrative, and said I hoped to see him again; on which he took leave of me with the most reverent oriental courtesy.

Noticing a crowd on the beach one day I hurried to the spot, and observed a number of that oddest of "odd fish," the lump-sucker (*Cyclopterus lumpus, Linn*), lying on the pebbles, which had been caught. This fish is thick and clumsy in body, and were it not for its power of adhering to objects would be knocked to pieces by the billows, for its fins have little power over the water. The colouring is brilliant, consisting of blue, purple, and orange. From its heavy appearance it has been called the lump-fish.

A stout, middle-aged matron proposed to purchase one of the largest of the lump-suckers. She was very much over-dressed. She had a goggle-eye, scarcely any nose, and an enormous, almost lipless, mouth. She had a frill under her chin.

I looked first at her and then at the fish; there was a great resemblance between them. Like this fish, she was nearly as broad as she was long, and gloried in gorgeous clothing, which contrasted painfully with her awkward shape.

This fish might suitably have adhered to the ship *Goed Vrouw*, in which Henrick Hudson sailed, as described in *Knickerbocker's History of New York*. "The ship itself was modelled after a fair woman, the greatest belle in Amsterdam; and accordingly the ship was 100ft. in beam, 100ft. in keel, and 100ft. from the stern post to the tafferel. Like the beauteous model, she was full in the bows, with a pair of enormous catheads, a copper bottom, and, withal, a most prodigious poop."

Tempted by the fineness of the afternoon, I entered one of the numerous sailing boats. Being alone, I preferred a public one, and found a comfortable seat in the stern. My neighbour was a man about fifty, dressed in a somewhat greasy coat and hat, and having a sanctimonious expression of countenance. He asked me in a whining tone of voice whether I would have a tract, for which I thanked him, and, giving a hasty glance at the first page, I said that on the whole I sympathised with the tract distributing movement, as a means of moral and religious instruction, which, notwithstanding the advance of science and art, appeared as much required as ever.

"Have you seen much benefit yourself from the distribution of tracts?"

"I am an old tract distributor," he said, "although no tractarian, and have given away half a-million of tracts myself."

"You must make it your busi-

ness, then. Do you make your living by it?"

"I hardly like to say that; but I am attached to the 'Home Mission,' and this is part of my duties."

And he proceeded to talk rather intelligently about the work and the great success it had had, especially through his own instrumentality. He said his salary was but £80 a-year, but his wife had £60 a-year, and on that, having no family, they lived very comfortably, as he made no pretence of being a gentleman.

On the return of the boat we landed, and, finding that he knew a missionary I had formerly met, I asked him some questions as to his present condition and residence.

"Oh, Mr. Sounds, M.A., has gone all to the bad, sir; he wasn't fit for God's work at all. So, after trying his hand at it unsuccessfully for some years, he emigrated to South Africa, where he failed as a farmer; came back to England and married a woman twenty years younger than himself, who keeps a small Berlin wool shop; and he hasn't done anything since. She has a hard struggle to keep herself and two children, for Mr. Sounds thinks himself too much of the gentleman to appear in the shop.

Sounds had been once or twice in our house, for we took some interest in missionaries, and he had the reputation of being a scholar and a gentleman. The City missionary said that he was collector for one or two societies. Taking out a copy of a report, he showed a long list of subscriptions which had been collected by himself.

"Lord B—— gave me £5, Lady S—— £3 10s., and I have had hosts of postage stamps. I collected £240 last year. I should be proud to put your name down for any sum you like."

Mr. Tractor, for that, he said, was his name, gave me a copious *viva voce* balance-sheet of his own, and one or two other societies; and on a broken tile he chalked off what the different secretaries and other head men received, and concluded by pressing me rather earnestly to help in the good work.

My pocket being at that time rather light, I felt in a dilemma, for I was always reluctant to refuse, and especially so civil and plausible a man as Mr. Tractor. I was greatly relieved by seeing the tall figure of my friend the Turk approach, this time without his smoking-cap and shaggy coat, having replaced them by a fashionable surtout and "wide-awake." He came towards me, evidently to renew our acquaintance, but turned a little on one side on seeing the company I was in. On this I went towards him, and he saluted me cordially, and said he had often roamed about looking for me, as I was the only person who had spoken a kind word to him since he was in Brighton. This was a good deal to acknowledge, so I took it as a great compliment, and invited him to sit on the seat. I fain hoped that the missionary would leave us, but instead, he commenced a short sermon for the benefit of the Turk, on whom he evidently made a deep impression.

"I believe you are right," said my Turkish friend. "The Christian religion is the only true faith, after all."

"Have you been baptized?" said I.

"Not yet. I can't make up my mind whether I should be dipped or sprinkled."

On which Mr. Tractor flared up.

"Now, sir, there's nothing about sprinkling in the Bible, and if you want to go by that you must go into the water."

"I believe you are right." said the Turk, again. "But who am I to get to dip me?"

"I shall be very happy to baptize you," said the missionary. "I have lately done that office to a Jew. A little past the houses at the west end

of Brighton we both went into the water for our morning bath, and after a good long swim I baptized him, and afterwards we adjourned to the Red House, and had some bread and cheese and beer. He gave me five shillings, being but a poor pedlar. I let him off fifteen shillings, for my proper fee is £1."

The Turk was much interested.

"I shall get you to baptize me," said he, "and I do not mind paying £1, only we must have a bathing machine, for I could not dress in public before the infidels. I beg your pardon, I mean Christians."

"In that case," said the missionary, "I should have to charge you £1 1s. One shilling being for the machine."

The missionary seeing his vantage ground, pulled out his subscription list, and read over every name that had a "handle to it" with great emphasis.

"Well," said the Turk, in a somewhat disparaging tone, "I thought you Christians did not need missionaries, being already of the true faith. All this appears to me a waste of your time and energies. I have great sympathy with the heathen, but none with the so-called home missions."

"Perhaps the heathen missions are the most urgent," said Mr. Tractor, "I have got a list of the principal ones in my pocket."

So he handed the Turk a very imposing elegantly printed foolscap, containing accounts and abstracts of Turkish, Madras, Chinese, and Sandwich island missions.

"What does the Chinese mission cost yearly?" said the Turk.

"£8,000," replied the missionary.

"How many conversions a year have you?"

"I really cannot say."

"How many had you last year?"

The missionary looked in his report.

"Five."

"How many the year before?"

"Seven."

"How many the year before that?"

"None."

"Then there are only twelve in three years, at a cost of £8,000 a year, or £24,000, for the whole time. So the conversion of each Chinese costs £2,000."

"Yes, sir," said Mr. Tractor.

"And in this way of calculation what is the cost of each Hindoo soul converted?"

Mr. Tractor thought a moment and replied, £770."

"Each Caffre soul?"

"£300."

"Each North American Indian?"

"£200."

"Each Sandwich Islander?"

"£25."

"And which are the best Christians?" said the Turk, in a particularly solemn tone.

"I suppose they are all equally good. What will you give in aid of this glorious work?"

The Turk thought a little, pulled out his purse, his note-book and pencil. "I should have liked," said he, "to have paid for a whole soul, but I cannot afford it—but I will pay part. Which," said he, turning to me, "is the most urgent? Suppose I give a pound to the Chinese mission, that will be the two-thousandth part of a Chinese soul. £1 to the Madras will be the seven-hundreth part of a Hindoo soul. £1 to the Caffres will be the three-hundreth part of a Caffre's soul. £1 to North American Indians will be the two-hundreth part of the North American Indian's soul, and £1 to the Sandwich Islanders will be the twenty-fifth part of a soul of a native of that group."

All this time I could hardly keep my countenance. I looked at the missionary; he looked very sly indeed, and turned away his head.

"How very expensive conversion is," said the Turk, "money goes scarcely any way."

"Certainly not in vulgar fractions," said I, "for my part I never heard of the division of a soul before."

I said the word soul rather loudly and attracted the attention of a fisherman who came towards us crying—

"Live soles, sir. The finest that were ever seen in Brighton. Sixpence a pound, all one price."

The missionary and I on this burst out laughing, much to the astonishment of the Turk, whose sedate mind could not understand our mirth.

"Let me see your soles," said I.

"Here they are, I'll take them to any part of the town you like and skin them, or not, just as you please."

"Will you sell a bit of one?"

"No," said the fisherman, "we never divide a sole, the most we do is to sell less than a pair."

"I can't afford a pair or even one," said I, glancing significantly at the Turk, "but I might the two-thousandth part of one."

The fisherman soon left us, saying, "I see you gentlemen don't want to buy live soles."

As soon as he was gone the missionary and I roared with laughter, and as soon as we were quiet, the Turk said,

"I really do not see what there is to laugh at; we were in the midst of some very religious and profitable conversation, and this missionary gentleman had almost persuaded me to be a Christian, but this rude laughter makes me almost shake in my resolution."

The missionary said, "I own myself much in the wrong, but the flesh is weak. However, I think this little incident may convey a moral lesson to us all. This fisherman, whose name singularly enough is Peters, refused to divide a sole. Now, my friend, this is a lesson to you. Subscribe £25, the cost of an Otaheitan soul, and you will be none the poorer. But take my word for it, 'Your barns will be filled with fatness, and your presses will burst out with new wine.'"

"I think it wrong to drink wine, having been brought up a Mahommedan; but if I give £25 to this mission, I cannot give anything to the others." So he counted out five £5 notes, and handed them to the missionary, who gave him his benediction and his card, and asked him to call at his lodgings, where he would be happy to furnish him with copies of his reports, and taking off his hat, with great respect he said, "Good morning, your Excellency."

Some time after this, on calling on a friend, I saw Mr. Tractor, who told me he had baptized the Turk, who had made him a present of £5.

After he was gone my friend advised me not to entrust Tractor with any subscriptions, for he thought, with Napoleon I., "*L'état c'est moi.*"

The Turk after this returned to his own country, where he was raised to the dignity of a pasha, and was sufficiently interested in missionary work to employ secretly forty Christian missionaries entirely at his own expense. Disgusted with missionaries of the Tractor type, he employed natives at rates that they could not be reproached with having made a gain of godliness, although they might acknowledge that in their own case godliness was great gain.

[This is the first of a series of studies of character from real life in England and France, which will be continued in the Magazine.]

ON EVOLUTION: BY PROFESSOR OWEN.

Adjourned Discussion on Mr. C. O. Groom Napier's Paper, before the Psychological Society. (*Continued from page* 96.)

MR. NAPIER said:—"Professor Owen has kindly given me the benefit of the proof sheets of his 'Memoir on the Wingless Birds of New Zealand,' shortly to be published. The Professor concludes thus with reference to these birds:—

But what can be said as to their origin? The first ground which suggests itself as a basis of speculation is literally, as well as figuratively, New Zealand itself. Since no evidence of such birds as those ranging in size from Notornis to the maximized form of *Dinornis* have been found in any other part of the globe, the conclusion seems legitimate that the species of those genera, as of *Aptornis* and *Cnemiornis* did not exist elsewhere, at least on any known existing tract of dry land. The naturalist, on the discovery and exploration of New Zealand, recognized the rare circumstance that save the Maori and his dog, no predatory land animal existed in the islands, which could have alarmed or endangered the existence of such birds as form the subject of the present work; nor has any evidence of such enemy been discovered in any stratum or locality of either the North or South Island. It is indeed accepted as a notable fact in the geographical relations of living things, that with the exception of some bats and shore haunting seals, the mammalian class was unrepresented in New Zealand prior to the comparatively recent advent of the Polynesian people. The earliest maritime discoverer may have left the rat. Cook introduced the pig. Colonists have since spread abroad their domesticated mammals. There is no native terrestrial reptile in New Zealand, nor any evidence of an extinct one which could have alarmed and stimulated an *Aptornis* or a *Dinornis* to the strenuous act of flight, if the ancestors of these birds had even possessed wings in full functional development. It is true that a raptorial bird of unusual size did co-exist with the Moas (pp. 141—150); but the menacing approach of such an enemy would excite a rush into the bush, the cleft, or the cave, not a rise into the medium of which an eagle is master. A swift course on land or sudden dash or dive in water, would better avail in escape than such inferior flight as a coot, or goose, or a moa, could have accomplished if they possessed such wings as one associates with an idea of a "normal" bird. The fact of a range of variety in size has been determined in the individuals of many species. Such variety affecting a cereopsis to the degree shown by *Cnemiornis* would in a corresponding degree render the act of flight more difficult and laborious. Consequently if that act were not needed for the acquisition of food, it might seldom or never be exercised in the absence of any enemy from which it would offer a way of escape. By long disuse of the wings, continued through successive generations, those organs would become enfeebled, and ultimately atrophied to a degree affecting their capability to raise the body of the bird in the air. The legs then monopolising all the functions of locomotion, would attain through the concomitant frequency of exercise, proportional increase of power and size. Under these conditions may be comprehended the origin of the great flightless Anserine bird, which is entered as a "species" in ornithological catalogues, under the name of *Cnemiornis calcitrans*. The same course of cogitation leads to the same conclusion as to the origin of *Notornis*, of *Aptornis*, and of *Dinornis*. The tendency to variation in size and proportions after the reduction of wings to rudiments, leads to the minor modifications called species, of such flightless genera. The alternative is to surrender thought upon the mode of origin of such genera and species, and to repose in the conclusion that by some inconceivable miraculous manifestation of organising force, a male and female of *cnemiornis calcitrans*, of *Notornis mantelli* and of each species of Aptornis and Dinornis, were at some remote and unknown point in time created with the fruitful power of propagating their kind, and that it was the pleasure of such creator to construct their wings, bone for bone, muscle for muscle, nerve for nerve, after the pattern of the organs of flight in the normal birds most nearly allied to them, but at the sametime, to make the wings too small for the purpose of flight in these exceptions to the volant and feathered class. Moreover, in such hypothetical instances of special creation, the miraculous power has been exercised in the limited area of our planet's surface now represented by New Zealand, and under

conditions which rendered the useless appendages of no detriment to the well-being of the created species, until a period when these would, through want of wings, be blotted out of creation.

In illustration of the alternative view of the coming-in of species by the operation of a secondary law, I append to the pages devoted to the wingless or flightless birds of New Zealand brief accounts of similarly crippled birds from other localities.

There was a time when a northern sea-bird, larger than those now breeding in the "Summer Isle" of the North of Scotland, and elsewhere in northern latitudes, flourished through its powers of obtaining food by diving and swimming, but which had lost its power of flight. It nevertheless possessed wings differing in no respect save in proportional size from those of the type manifested by the smaller existing awks (*Alca torda*) which still exercise them in flight, and retain them of the due proportions for that act. The increase of size of *Alca impennis* may be supposed to have been the condition of the discontinuance of the laborious attempts to carry its weight through the air. But the wings continuing to be applied, as in the smaller kinds of awk, to assist in swimming, were retained of the size and with the proportions and the stunted closely imbricate plumage, best adapted to the natatory function.

Ultimately came the great destroyer on the scene of life; and all recorded evidence goes to gain the verdict that the extirpation of the species (*Alca impennis*) was the work of man.

Assuming a secondary law of the origin of species, the conditions of the characters of *Alca impennis* are explicable on the Lamarckian hypothesis of the *modus operandi* of such law. Rejecting a secondary cause in favour of a primary one, the original pair of *Alca impennis* were miraculously made in close conformity with the type of *Alca torda*, but with wings too small for the body and too feeble for effecting flight, such disproportion being the condition, on a coming event the destruction of the species. In the same view is added to the "Appendix" of the present work a brief notice of two species of terrestrial birds which, like Dinornis, have become extinct within the historical period, viz., the Dodo of the Island of Mauritius and the Solitaire of the Island of Rodriguez. It will be helpful in the present speculation to determine how far the conditions of existence and of extinction of these wingless birds resemble those of the analogous species in New Zealand. Both *Didus* and *Pezophaps* surpassed in size the existing species of birds to which they bore the nearest affinity. Each genus was restricted like Dinornis, to a limited tract of land. No evidences have been discovered in either Mauritius or Rodriguez of contemporary predatory animals, from the assaults of which a large bird would be impelled to escape by a rapid flight. Each of these richly wooded tropical islands afford abundant subsistence to vegetarian and omnivorous birds, and each prior to the advent of geographical discoveries, was destitute of creatures able or desirous to destroy such birds. If the food was wholly or chiefly on the surface, the power of traversing such surface would be of as much advantage, to the bird as to the herbivorous quadruped. As flight calls for more effort than course, so cursorial progression would be more commonly practised in such happy islands for obtaining the daily food. The advent or proximity of a known element of danger might excite the quicker mode of motion; the bird would then betake itself by a hurried flight to a safer locality. If, however, these insular birds had never known a foe, the stimulus to the use of the wings would be wanting in species needing only to traverse the ground in quest of food. In the case of New Zealand, for example, the roots of wide spread ferns, rich in farinaceous and amylaceous principles, tempting the birds to pluck, would stimulate such development of bone and muscle of the neck as is noted in pp. 407—420; or, if greater force was needed for the uprooting, the habit of scratching the food out of the ground would lead to excessive development of the muscles of the leg and foot. So such daily habitual exercise of legs and feet by unscared Rasorials would lead in successive generations to such developments of hind limbs as the Dodo and Solitaire present. We recognise in the stunted limbs of the Dodo as in the skull and the rest of the skeleton, evidences of its affinity to the Dove family (*Columbacei* or *Gemitores*). The framework of the anterior limbs, conforms, save in size and in the prominence of the processes for muscular attachments, to the scapula, coracoid, furculum, brachial, and antibrachial bones, carpus, metacarpus, limited number of digits, and their extremely modified phalanges, of the perfect instrument of flight in truly winged birds. The minor modifications of the volant mechanism, characteristic of the Columbacei, are as plainly demonstrable in *Didus* and *Pezophaps* as are those of the coots in the minor modifications of the useless wings of *Notornis*, and those of the Geese, in the like modifications of the useless wings of the *Cnemiornis*—"useless," in such instance, referring to the act of flight. These comparisons and considerations lead me to regard the Dodo as a degene-

rate dove. It exemplifies the origin of a species agreeably with the partially applied hypothesis of Buffon, and through the way of operation of the secondary law of the origin of species suggested and advocated by Lamarck. The same course of argument which has been suggested by the impennate awk of northern shores, and the flightless doves of the Mascarene Islands, applies, as we have seen, to the moas of New Zealand. But in these the degree of atrophy, which seems to have been carried to total loss of the hind appendages of the scapulo-coracoid arch, implies the operation of the influence of disuse through a period of pre-Maori æons greatly exceeding the time during which the Lamarckian law has operated on the Cassowary, the Rhea, and the Ostrich. In reference to the subject of the foregoing speculation, another hypothesis has, however, been propounded, viz., that birds are transmuted and advanced Dinosaurs, and that the feathered hot-blooded, quick breathing class made its first step in life-promotion from the naked, cold-blooded, slow-breathing reptiles, under the low form of *Struthiones* or *Cursores*, as yet incapable of flight. According to this view the Dodo is a prede essor of the crown pigeon, the *Notornis* of the Coot, the *Cnemiornis* of the goose, and the *Dinornis* of some, as yet unknown, winged form, unless the course of evolution through the Moas has come to an untimely end.

Alleged facts of embryology have been adduced in support of this idea, and the assertion has been hazarded that, "if the whole hind quarters, from the ilium to the toes of a half-hatched chicken, could be suddenly enlarged, ossified, and fossilized as they are, they would furnish us with the last step of the transition between birds and reptiles, for there would be nothing in their characters to prevent *us* from referring them to the Dinosaurs." I am barred, however, from joining the biologists indicated by the plural pronoun by the following facts:—The greater number of the sacro-vertebral attachments of the chick's ilium, in whatever degree enlarged and fossilized, would lead me to refer it to the avian, not the reptilian type, I should also note the presence in the ischium of an obturator process wanting in the Dinosaur, and the absence of a pectineal process in the chick's pubis, present in the bone of the Dinosaur, and further, the parallelism and backward extension of both pelvic bones in the chick, contrasted with their downward extension and divergence in the Dinosaur.

In further testing the embryological ground evoked, I find the differences between the half-hatched chick and the full grown Dinosaur grow and multiply as the comparison extends. The distal epiphysis of the chick's tibia is not only larger and more complex than that of the Dinosaur, but it articulates, not with one of four tarsal bones, but with the proximal epiphysis of a compound metatarsus. The fibulæ of the chick ends in a point at some distance above the ankle-joint, whilst in the Dinosaur its distal end expands, is parallel with that of the tibia, and has an epiphysis which articulates with a calcaneum. I should further note the backward direction of the innermost or first toe in the chick, and contrast it with the parallel position of that toe with the forwardly-directed second toe in the Dinosauria, before committing myself to a reference of an embryo bird to that order. If an entire skeleton of an immature bird of any order, whether volant or not, were enlarged to the dimension of that of a Dinosaur, the characters of the few dorsal and caudal vertebræ, of the many cervical vertebræ, and of the skull, the absence of an anterior pair of limbs with forepaws, organised to be applied to the soil, and to take their share in the support and progression of a long and bulky trunk, with the massive head of a Dinosaur, would be decisive against the reference of such imaginary gigantic chick to any known representative of a terrestrial order of reptiles. In no birds are the sacral vertebræ so few as in Dinosauria, and in those birds which, from the embryonal proportions of the wings, their great size and terrestrial habits, are adduced to exemplify Dinosaurian origin and affinity, the number of the sacral vertebræ ranges from seventeen (*Dinornis*) to twenty (*Struthio*). I may refer to my "Monogram" above cited for an analysis of the grounds of ascription of a bipedal mode of locomotion to the Dinosauria in further support of the idea of their ancestral relationship to winged birds through the terrestrial gigantic forms of the feathered class. In now submitting the grounds on which the view of the origin of the flightless or wingless birds by way of degeneration from antecedent winged forms is preferred, I fully appreciate the limited application of the Lamarckian hypothesis, in the exposition of the secondary law of the origin of organic species. But I would add that, without knowing or pretending to know the ways of operation of such secondary cause, the vast increase of knowledge—stores of biological phenomena makes it as hard to comprehend them intelligibly in any degree, on the assumption of primary or direct creation of species, as it was difficult for Copernicus to understand and explain the vast accession of

astronomical facts in his day on the belief of the subservient relation of sun to earth, of the posteriority of the creation of the luminary to that of the light-receiver, and of their respective relations of motion as then held. To the objection how, on his assumption of the diurnal rotation of the earth, loose things remained on its surface, Copernicus could offer no explanation. Neither has the biologist been able as yet to explain how the *Ramphorhynchus* became transmuted into the *Archeopteryx*. It is open of course to deny such change, or that the feathered class has been in any way a development of an unfeathered one. But if speculation on the origin of Aves by secondary law be allowable, the extinct volant forms of the Reptilia offer a much more likely point of departure than the extinct heavy quadrupedal and terrestrial forms of the the cold-blooded class. And if we restrict our survey to a narrower field, where conditions of life and of structure are surer and more abundant, and so speculate on the genesis of *Didus* or *Dinornis*, guiding or reining the roaming fancy by facts, the geographical limitation of such ornithicnitoid species and their primitive association exclusively with creatures of which they could have no dread, suggest the more obvious and intelligible hypothesis of derivation from antecedent kinds of flight, whose wings they still show more or less aborted, according to Buffon's principle of transmutation by degeneration, with a progressive predominance of the legs over the wings, ultimately resulting, agreeably with the Lamarckian view, in a maximation of the terrestrial and abortion of the ærial instruments of locomotion.

RICHD. OWEN.

Professor George S. Boulger, F.G.S., F.L.S., in opening the discussion, said he spoke under disadvantages, as a visitor, and as one who had been obliged by Mr. Napier with a copy of his paper, and as having, in common with a large number of scientific men, been styled a ghost. If he was a ghost he was ready to go to the wall for a stronger opponent, but before doing so he must be convinced that the other side was not as ghostly as his own.

He thought Mr. Napier confused two questions, the origin of Bacteria and the origin of species, which he held to be entirely different. Darwin had nothing to do with the origin of life, but merely with that of divergence of character or specific distinction. He thought Mr. Napier put a weapon into his hand when he said "the system of classification of organic life bears an analogy to that in human society. Classes represent races; orders, nations; genera, families; species, households." This he thought an admission that households, and families, and nations were descended from the same ancestors, but he did not wish to strain the point as he preferred homology to analogy. He thought Mr. Napier right in insisting on a complete knowledge of forms before calling them species. He thought that the general public were not judges of specific characters. He thought Paracelsus mentioned in the paper a semi-mythical personage. He thought Darwin's theory scientifically justifiable, whilst Lamarck's, lacking evidence, was not so. Professor Owen, from what he said at the Geological Society lately, seemed to admit Lamarck's modification of organs by use, and thought Mr. Napier admitted this also, in what he said about large grained wheat and trees being stunted when grown in exposed situations. But the Darwinians thought that a stunted race would be formed by the principle of descent, in time irreversible. He claimed unlimited time, comparable with astronomical space, and said there was no evidence for its limitation. He instanced as a case of modification of type, that of some Spanish rabbits turned out in the 15th century on the rocky Island of Porto Santo, which, he said, dwindled to the size of rats, and were incapable of breeding with the supposed progenitors. He asked if Mr. Napier were sitting on an oak tree and saw two of its leaves side by side, would he expect to find them united by their tips or on a common twig by their stalks? The horse and the ass are two twigs of the genealogical tree of the *Equidæ*, which we do not expect to find

united by transitional forms, but by —what we do find—generalized forms, presenting a fusion of many now distinct forms. These, as Professor Huxley has said, present a demonstration of evolution. Professor Marsh has described forms having two lateral toes, partially aborted and standing on three, and forms in which two toes have disappeared and two more are useless, the animal standing on one, whilst in the horse the two lateral toes are reduced to the small lateral "splint" bones. Professor Leith Adams tells us that he can trace an equally perfect series of elephants from the Mastodons of the Miocene. Professor Boulger said that at Walton- on-Naze the shells were beautifully preserved in the Red Crag and that every transition between the *Trophon Antiquus* and *Purpura lapillus* were found, and yet there was an acknowledged distinction between the species as now found recent, a genus had in fact originated since the Crag. He admitted that the various races of domestic pigeons had originated by human selection, but said some of them will not intercross. The same he said with regard to dogs. As regards markings on natural objects resembling letters he attached no importance to them, as Mr. Napier had not shown that the natural objects occurred in the country where the language originated, and that they (the inhabitants) were not shown to have spoken either in Hebrew or Greek, he thought the marks were accidental, he heartily agreed with Mr. Napier that the dogma that species had their origin in single pairs had no foundation in science, though he had heard of Noah's Ark and one or seven pairs. In conclusion he asked Mr. Napier with which of the generalizations to which the theory of Evolution is reducible he joined issue. The theory was based on the Malthusian generalization, that organisms increased rapidly while the size of the earth remains the same, hence the struggle for existence. The few trees grown from thousands of acorns, the two or three carrion crows produced by five eggs are instances. The law of hereditary descent, that offspring resemble their parents and that this resemblance is not exact, that variations that occur cannot either be disputed. In the struggle for existence the variations most fitted for their surrounding conditions will survive. Evolutionists, he said, do not speak of indefinite variability. The swiftness of the racehorse was greater than that of any quadruped; the fantail pigeon had more tail feathers than any other bird.

A few remarks were made by Mr. Sergeant Cox, Mr. Spencer, Dr. Peebles, Dr. Nicolas, and contributions to the discussion by letter were sent by Dr. C. R. Bree, the Rev. F. O. Morris, the Rev. Mr. Dallinger; and letters of apology for not attending the discussion were received from Professor Tyndall, Dr. Darwin, the Duke of Argyll, Prince L. Buonaparte, &c.

Mr. Luke Burke the late editor of *The Future*, said: In the first place I affirm that, in so far as my acquaintance with the subject goes, there has not yet been brought forward a single genuine fact, or single biological or physiological law which logically *necessitates* the truth of the Darwinian theory, while I affirm with equal confidence that there are hosts of facts, and some of the profoundest laws of nature which directly and absolutely negative the theory. Let me first say a word on the question of law. There are two great laws which underlie all phenomena, all being and all action, the law of *Causation* and the law of *Correlation*, the latter being a direct corollary from the former. The law of Causation affirms that only like causes can produce like effects, and therefore that

in proportion as effects differ their causes must differ, and, conversely, that in proportion as effects resemble each other their causes must resemble each other. This law admits of a demonstration as full, and clear, and authoritative as any proposition in Euclid; and though superficial objections have occasionally been brought against it by speculative writers, yet every human being *practically* obeys it in almost every act of his life.

The application of this law is simple. Mind is an attribute possessed in different degrees by certain beings, and not possessed by others. What it is its special property to do can therefore be done by nothing but itself, only like causes can produce like effects, and no cause but a mental cause, can be like, or perform the effects of a mental cause. For the absence of mind in any given case is the nonentity of mind in that case, and to say that which does not even exist can exercise special and great powers is plainly absurd. Nay more, it is to say that things wholly devoid of mind are infinitely more wise and powerful than the very highest of the mental agencies actually known to man, for though man can produce artistic combinations and mechanisms of curious structure, these wonderful nonmentals can make man himself, and the world which he inhabits, and the great universe of worlds which stretch out beyond him into the depths of space. And yet with all this wonderful power assigned to these mighty physicalities, to this nebulous ether, to these gases, and liquids and crystals, and to the primary elements which compose them, not a living soul believes that any of them or all of them conjoined can make a pair of shoes, or mend a broken window, or do any other orderly thing within the sphere of human knowledge! Is not this absurdity, and yet is it not what we always imply consciously, or unconsciously, when we attempt to explain the universe by mechanical laws and non-vital agencies only. Nature indeed in her higher workings, does not follow the method which man pursues in his best labours. He takes passive materials, makes them into shape and places them according to requirement. Nature on the contrary takes materials which work together actively, and by their means produces structures which are self-formative. The very nature of these structures proves them to be products of mind, and it is only in the mode of working, that they differ in principle from the productions of human ingenuity. Nature works chemically by means of materials brought into conditions fitted for chemical combination. She produces in some way, as yet unfathomed, a primary organic simplicity or *germ*, which, however much it may be a unity to the eye, must from its labours be a wonderful little machine. She places this machine in a fluid medium, containing materials calculated to excite it into action, and places that medium in another medium, and so on, and the results of the labour of our little machine, are that it finally converts itself into a wonderfully complex machine, full of all sorts of correlations, and harmonies, and previsions, and purposes fulfilled, and confers on it the power of producing by its own agency, and without the further interference of the original formative agency, the faculty of producing a long train of mechanisms similar to itself.

Mr. C. O. G. Napier, in reply to the various speakers, said: He especially thanked Professor Boulger for his careful comment on his paper, which he thought almost as good an answer to it as a Darwinian could give. But at the same time he thought the answer failed to break through the lines of his attack on Evolution and the Darwinian hypothesis, namely, that no proof had

been given for the origin of organic life from inorganic matter, and that the lowest organisms came from spores and the highest from eggs. The distinction between "natural selection" and the origin of life, he thought to be not a sound distinction, since every form of life appeared to be but links in a chain, each distinct, yet each more or less closely connected with another link. Yet the very apparent occurrence of a chain proved a distinction of links. The theory of Evolution appeared to have no base to his mind, unless the organic life originated from the inorganic. The Rev. Sydney Smith, in reply to a sceptic he once met at dinner, asked him if, "after a hearty meal, he was prepared to deny the existence of the cook." So it appeared to him equally unreasonable to assign the origin of life to secondary causes. Dr. Darwin, a most candid, amiable, and truly great observer, being somewhat deficient in logical acumen, either from the fact of natural deficiency or from excessive devotion to objective natural history, instead of beginning at the head or tail of nature, began as artists generally do in their sketches, in the middle. Hence there is but little sequence in his instances, and no conclusiveness in his proofs, as regards his great idea of the origin of species. With regard to Paracelsus, he was instanced merely as an old author, whose name was associated with a doctrine on which Mr. Napier much relied, that of man the "microcosm." In the *Book of Nature and Man* he said :—

The variation of so-called species would be explained if we supposed a creation of thousands or hundreds of thousands of each species, with variations suited to the climate in which they were created, to be still further accommodated to circumstances as time rolled on. This is absolutely opposite to the Darwinian hypothesis, which supposes the existence originally of a very small number of species, the varieties of which are the now so-called species. This first hypothesis is more satisfactory to my mind than that of Darwin.

The Ionic philosopher, Anaximander, quoted (Plat de Plac. Phil. v. 19), says that "All primitive living things were engendered in the moist, being surrounded with a prickly skin, and, time going on, that they came out upon the dry ground, and for a little while lived another kind of life." Also that "at the beginning man was developed out of different formed ancestors, the proof being that the early things could quickly shift for themselves; but man alone had need of a long nursing-time, so that originally he being such, would have had no chance of surviving. Man must have had his origin among the fishes, and have been nourished in his intermediate state like the creatures of the mud, emerging afterwards and becoming tenants of the earth, when sufficiently evolved to help himself there." This curious passage from the Greek shows that the greatest speculation of modern days must be yielded by Lamarck, Wallace, and the mighty Darwin to an older philosopher, even if Assyria claims the original idea. Ovid also spoke much of change in form in his celebrated *Metamorphoses*, hence it was an old idea. Dr. Darwin, he believed, had his modification of it from his ancestors of the same name. Mr. Napier was quite ready to admit to a limited extent modifications of the organs of animals by use :—

Man can breed horses and other animals suited to his purpose, and produce modifications in them in accordance with his will. He can perpetuate and increase peculiar qualities, and subdue others, until they gradually approach his ideal. The same laws which regulate the breeding of animals influence the offspring of man. Judicious selection, which should be by no means Natural, should bear on this important matter. The lessons taught by history, physiology, and mental philosophy, render clear to us how *transmutable* men's qualities are, and how he has himself in his own hands. Surely man should not regard himself *less* than

he brute, If he can improve the race of his domestic animals, if he can increase their good qualities and remove their defects, if he can increase their defects and lessen their good qualities, surely he is bound to apply the same principles with *discrimination* for the benefit of his own race. *

Before attaching any importance to the rabbits of Porto Santo as an argument for modification by climate, he would require a correct description of the Spanish rabbits from which they were supposed to have sprung, and the pedigree of the little rabbits which are now found there. Otherwise no conclusive proof could be found for the fact of their not being of a different origin from the rabbits now found in Spain. If this were clearly established it would merely prove that the rabbit, like other domestic animals, was liable to be modified to a certain extent; but no weight, in his opinion, is to be attached to modification amongst animals and their wild types, unless it can be shown that one family passes into another. Difference of size, as in dogs, might prevent intermixture; but this difference is liable to be modified by the intermixture of those more approximating in size, until the great divergence of size disappears. This was an answer to Mr. Boulger's argument, derived from the oak-tree. The leaves he does not expect to see united by their tips, but only united to twigs, which are in turn united to the branches and to the trunk. This tree is a living instance of union between widely separated parts; but amongst genera and what we consider species, no such union is visible, and we cannot therefore assume that it exists. Professor Marsh's argument, derivable from the fossil animals of the horse family, has no weight, since we know nothing of the life history of these animals. We see nothing of the disappearance of bones amongst the living wild animals of the present day; therefore we have no right to assume that they disappeared in past ages. Palæontology is worthless unless it is based on the close comparison of extinct with living forms, and its conclusions based upon precise analogy. It is this basis alone that made George Cuvier and Professor Richard Owen great men, and will enable many following in their footsteps to achieve great reputations—and why? palæontology thus pursued is resurrection. "Can these dry bones live? . . . . And the breath came unto them, and they lived and stood upon their feet, an exceeding great army" (Ezek. xxxvii.). With regard to what Professor Leith Adam says of the transitions between the elephants and the Mastodons of the Miocene, we should require demonstration before we admitted even an *apparent* transition; but a *real* transition by descent and pedigree would be alone satisfactory to his mind. English law scoffs at such evidence for the proof of a pedigree—a mere likeness, even if it can be established, can give no claim to an inheritance, the evidence of birth is required, unless it is established the case fails. The majority of men of common sense, whose minds are not warped by the influence of a dominant pursuit, will agree with him that the evidence for a pedigree fails if the evidence for birth fails. He would ask the chairman, Mr. Sergeant Cox, a gentleman learned in the law, whether he was not right, and whether or not the law, as regards this point, is not identical in all civilized countries. Therefore, if he were right he must dismiss the evidence of pedigree in Palæontology as not founded on fact.

The age of great reptiles is passed or is passing; the age of great quadrupeds and

* "Book of Nature and Man," p. 315.

the age of great birds; but the age of man in the plenitude of power is coming. From the few relics of the moa and the dodo that we have, Professor Owen has built up perfect skeletons, which give a vivid idea of them; so that the naturalist when wearied with anatomical details may dream of extinct birds.*

Professor Owen desires to limit creation. Why limit it? The creation of a great thing is as much a miracle as the creation of a small thing—the man or the protozoon. Every class of vertebrates has some special strength of construction, each species some anatomical peculiarity. I hold a defiant position when I say every anatomical peculiarity *was created for a use.* This age has been called utilitarian: but a denial of the correspondence between function and construction is a libel on the Maker. Why is the apteryx without wings? Because it is a burrower working its way like the rabbit or the mole beneath the soil. I defy proof that the apteryx ever had any more development of limbs than it has at present. It is perfectly constructed for its mode of life. If it was intended by the Maker for flight, it would, like the majority of birds, have had wings for flight. The reasoning of the Evolutionist philosophy is unpractical. It is founded on the study of the dead rather than of the living. Were as much time devoted to practical history as is now devoted to the romance of natural history, Evolution would be less popular, and it will be so. Ten years will see the theory dying, twenty years, dead. And why? because it has no foundation in living nature. The great awk, the penguins, the loggerheaded duck, in all instances used their wings as paddles. It is pure imagination to assume they were ever made for any other purpose than they have been in the memory of man used for. He felt but little confidence in the deductions from embryology as assigning an origin to species, as they are a metamorphosis which every individual of this species undergoes. Why, then, this perpetual metamorphosis, if one species is derived from another? This may be affirmed of the living; facts are silent with regard to the extinct. Professor Owen has given a logical though hypothetical base by arguing on the Lamarckian theory of progressive development, but one from which the premises have been destroyed, by the recent proof that the alleged spontaneous origin of Bacteria is founded on mistaken observation. There is no branch of natural history more interesting than ornithology, and no part of it more so than the scanty knowledge we possess of the extinct birds of New Zealand. The only large animals unimported by the British, which have in recent times inhabited this group—they possess unique features which give a character to the fauna; this is a fact, but what do we know of their origin?—nothing but what we find in imagination. They are instanced as examples of the extirpation of species by man, and no better instances can be found. Like the great birds of Mauritius and Rodriquez they are extinct. Let us endeavour to recall for a moment the days when the dodo reigned the principal animal of the island of Mauritius. The lovely isle was richly wooded, well watered, and very fertile. The scene of the tale of "Paul and Virginia," has thrown an air of romance around its shores. In the days of the dodos' reign, it was uninhabited by man; and his first settlers conquered its kingdom. It is now occupied by a lively and industrious population, who have rendered it one of the most productive spots on earth, for the valleys produce abundance of sugar-canes,

* 'Book of Nature and Book of Man," p. 239.

yams, manioc, and maize. Various islands of the ocean ruled by wingless birds, have undergone similar changes. Where are now the moa of New Zealand, the epyornis of Madagascar, the great awk of Iceland? Dead, behind the march of man for ever! In like manner his savage races perish before the advance of the civilized.

THE HISTORY OF A PHILOSOPHER

(Continued):

HIS SHIPBOARD LIFE.

Darwinism and Learned Societies.

My wife and myself had brought a number of fowls on board for our private consumption. The cocks used to fight, which the parson called "fowl play," and, disliking it, he offered to purchase the combatants for the cook. After some bargaining about the chickens he abruptly broke off negotiations and accused me openly of chicanery.

We were cousins, so I said, "It's not chicanery, its cozenage it it's anything at all."

There was another parson on board, a Mr. Raven, who would sometimes read poetry to us. He pronounced some words very curiously. Poems with him were "pomes," and poetry was either "potry" or "pottery." All these words were said in a croaking voice, or, as the parson Asinus learnedly said, "in the music of the Corvine family."

We had once a general conversation on diet. A great butcher said there was "nothing wholesome but beef, mutton, and bitter ale." A leading fishmonger, that the strongest men "were nourished on mussels." The parson said this was "a very sel-fish argument." The conversation then turned on musical performers. Some tradesmen, it was said, couldn't play at all, having too coarse hands, others from being too spidery in the fingers. For my part, I admired great execution, even if it should come from a hangman, or other eminent executioner.

"What a talented young man you are," said the old lady I have mentioned. "Your parts are wonderfully numerous."

"Well, hang it," said I, "that may be; but they would be much more so after I was hanged, drawn, and quartered."

There were several sheep on board for the first-class passengers. They were poor, half-starved things; but yet the steward called them all "full-mouthed-ewes."

"You are a good grammarian," said the parson one day to me; "tell me the gender of this word."

"Which?" said I.

"This."

"In these cases," said I, "I always allow myself three guesses, for then I am sure to be right with the gender."

I do not know how it is, but whenever I talk of grammar I always get a headache, for it calls painful recollections to my mind; my poor forehead is so swollen and tense that I feel quite in a bad mood, and I know that I shall not be able to dine on substantives.

There was a mulatto on board. I could see all our Yankee girls loathed to sit at the same table with him; they quite turned pale, and then looked quite black at him. It seems strange that this should be the case, when he was so highly coloured. He, however, assumed airs of great superiority, for he had "blackened" them quite as much as they did him. As was my habit when anything curious occurred, I fell into a state of profound meditation, and argued with myself on the matter of the distinction between light and shadow, black and white, as well as of the various shades between them. It is an undisputed fact that most men and women feel a great gulf between themselves and coloured persons. They are not appreciated either by their father's or mother's relations, who feel that they have to do with crosses. Mules most of all resemble mulattoes, who are called after them. Mulattoes eagerly imitate their white parents, with whom they would gladly be on an equal footing; looking down with profound contempt upon the darker parent, with whom they would not be classed for a moment. In their attempt to be like their white parent they only excite our mirth; they should form a class in themselves, but should not despise their black ancestors, for they more nearly approach the negro than the European type in almost every case. This feeling on their part reminds us of the fable in which the mule contemned the ass from whence it sprung.

As a boy I had a great taste for Natural History, which was, however, chiefly exercised in killing bluebottle flies, and in rat catching, operations which my father considered of great economic value. With these tastes you may imagine my delight when I encountered on board, a relative of the distinguished Audubon, a noted beaver trapper. He described the animal as having a more than human intelligence, and the eyes of the listening company opened wide at the tales of the vast constructions of this animal. How it turned the course of mighty rivers, and reduced fine agricultural land into swamp. "Then," said I, "a beaver's *dam* is a country's curse."

"You are quite right," said Parson Asinus, "but you have made an execrable pun."

"How should I do otherwise when the beaver is such a bad animal. Am I not right, Ma*dam*," said I, turning to my old lady friend.

She laughed and said, "You musn't swear by me like that; I am not your dam or your grandam either."

We came at last in sight of the white cliffs of Dover. I felt an almost English enthusiasm at seeing them. My little heart leapt as a shrimp, and my face turned as red as a lobster with emotion; but my old lady friend was as cross as a crab. We landed. No tongue can tell my emotion. I wrote an account of my voyage to my father, but was in such a hurry to stop that I entirely forgot punctuation. I think our first impressions of a country and its people are the most valuable. I at once came to the conclusion that John Bull had the largest and finest calves in Europe. They are far before us in these respects. The bulk of Yankees are thin and slender; they are crank craft, built for fast sailing rather than rough weather, or a long voyage of life. They are of clipper build at best; they beat John Bull hollow in speed, but cannot carry near his cargo of oil, or flesh and blood. We laugh at John Bull for being Dutch built, but after all no sea will sink this tub of a fellow.

I wandered about London to execute commissions for friends at home. One clergyman, wonderful

to relate, wanted half a dozen *lay* figures. I didn't like my wife being with me when I bought them.

"Hide your blushes under your your fan, my love," I whispered. I did not intend to be sarcastic; but in truth my "lovely young Lavinia" never blushed.

When we had been three days in London, we made a short excursion by "Rail." By the side of "the line" were a number of *sleepers*. I looked out of the window as we moved along.

"What are those," said I, to a stout elderly gentleman opposite.

"Sleepers, sir; the train can't run without them."

My gentle hearted wife started.

"What a frightful thing railway travelling must be. I don't think I can travel again by rail for fear of running over the poor "sleepers."

"You *must* go over them," said the old gentleman, who turned out to be a railway director. "You can't 'urt them, they're hinhanimate hobjects."

My wife upheld the old system of road travelling. The old gentleman shook his head.

"It wont do nowadays. *Hits* behind the march of the *Hage:* and besides, at *hits* best, it has *hits* disadvantages. Waggoners are not a long lived race, they are too often on the Wain."

This worthy director's wife was travelling with him; she was apparently about half his age. After they left the carriage, one of my youngish fellow passengers said, "What a fine woman that is! What a magnificent height and figure!"

My wife turned towards him.

"Do you call her *fine*? I call her *coarse*."

"You're both right," said I. "She's both fine and coarse, in fact she's a FINE-COARSE-WOMAN."

This young man was a sort of travelling missionary and tract distributor apparently; for he handed us all fly leaves. One was headed "Gold Dust," another "Good News for Gardeners;" the one that I got, a sequel to the last, was the "Cab of Dove's Dung." On questioning my fellow traveller about his occupation, he admitted being a commercial traveller, but said he did a little missionary work by-the-bye.

"Do you think," said I, "a missionary should be a merchant?"

My commercial friend stared.

"This is a question," said he, "I'd rather not answer."

"Well," said my wife, "I think a merchant may rightly be a missionary; but I don't think a missionary should be a merchant!"

"Wife," said I; "you can't be serious—you really can't; I hold the reverse of your views. A missionary must live, and I don't see why he shouldn't live as a merchant as well as by anything else."

We got out of the train, and got into a cab, and were driven home to our hotel on our return journey.

While my wife had gone upstairs to get money to pay him his fare, I talked to cabby, and pulling out my tract I handed it to him.

He put on his spectacles and read with much solemnity, "The cab of dove's dung," "the cab of dove's dung."

"No power on earth would get me to carry dove's or any other dung in my cab; unless this ass's head (on this he touched his hat) was sold for five or six bob,—or pieces of silver."

As the cabman had returned me the tract, I gave it to the landlady, who next day brought it back to me and said—

"Hit's very hinteresting and profitable, to see how the hancients lived. Like us cockneys they couldn't do without cabs."

We had a little talk about cab-fares. My uncle had advised me as a boy, never to marry a lady that went in omnibuses or cabs, as they were objectionable as "bus" or "cab fairs." I thought him right,

so I looked out for a riding lady—a "horse fair;" this I got at last, as was quite fair.

When we travelled by rail we always went by Parliamentary train, which was the most fashionable way we could go, as all the Members of Parliament travel by it. We were not surprised to find that it was the cheapest—the best things always are so. It was, however, slow.

The scientific and literary papers —which of course I always read— were full of the reviews of Darwin's work "On the Origin of Species by Natural Selection." My wife thought he would have been nearer the truth if he had said un-natural selection; but we resolved to apply the doctrine ourselves, by selecting what pleased our natural tastes best in the shops of London. In going through one of the narrow streets at the "West End," I saw the name "Charles Darwin" over a shop door. A little boy obstructed our passage into the shop and looked up in our faces in an inquisitive and innocent manner.

"What is your name?" said my wife to him.

"They call I Charley Darwin."

"How old are you, my little man —orchis?"

"I'se in my eight." And he ran away to fetch his mother, screeching "Shop—shop," into the back premises. We entered and a clean looking woman soon stood behind the counter.

"Please," said I, "will you give me a quarter of a pound of the best natural selection?"

The good woman took down a jar labelled "Virginian Pure."

"I am sorry," said she, "we are quite out of it, but my husband has sent to the City for some more."

My wife laughed.

"Then give me," said I, "an ounce of 'progressive development.'"

"If you mean Scotch snuff, we sold the last of that this morning; but if you mean Jamaica treacle, we've plenty of that."

"You know, Ma'am," said I to the woman, "that your husband is a very great man."

"I think you've mistaken him, Sir; he's a very little man; he's a head shorter than me, and you see I'm an old woman."

I said I'd call again, and had hardly left the the shop before I roared with laughter.

You have all heard the story of the Mahommedan and the Christian missionary, who each succeeded in converting one another. And so I —anti-Darwinian missionary as I constituted myself—was destined to change my opinions. I had a large number of introductions to learned men in London. There were Messrs. Kettle and Steam, the well-known engineers, and F. R. Essays. There was Doctor Drugs, the eminent chemist, and Professor Specs, the the microscopist. He was a frog-faced, high-shouldered man, wearing gold and pebbles on the bridge of his nose, and with a most significant tangent-screw adjustment in the left corner of his mouth. His long arms moved with the regularity and precision of rack-work. But he nearly polarised my poor wife, she shrunk from him so. Well one gusty night in February Mr. Specks dragged me off to the Finnion Society, where fins, feathers, furs, and scales were, the principal subjects of conversation. It was an evening devoted to Geeupology, and the subject treated of was the important zone of *Ammonites Dustholeensis.* The learned lecturer, Professor Hammerem, dwelt much on the beauty and interest of the fossils he had obtained in these beds, where he found a Merchissona and an Arca, lying in the same bed together—fortunately there were no ladies present. Lower down in the series—for Professor Hammerem dug deep into the subject—was the zone of *Ammonites Cuttlescoalensis* where a much larger collection of

fossils were found. There was *Malleus hammerimi*, which the learned Professor had called after himself, from its being shaped like his own cranium. There was *Craniopterus*, a new generus of bivalves, which had a mark on the top of the shell, much resembling a human skull. In a lively discussion which followed the lecture, Sir John Noodledum, another of the F. R. essays, got up, and standing on tiptoe, for he was a very little man anxious to make the most of himself said,

"Mr President and gentlemen, we have listened to a most learned discourse, and I for one have profited greatly by it. It is interesting to observe the strong confirmation "Natural Selection" receives in the formation of *craniopsis*. These little shells, from trying to think through countless ages, have at last got into a form resembling a man's skull. Were they not unfortunately extinct, we might find in them an even closer link between man and animals. I can weep over their remains; had they had time to think a little more, there is no saying whether or not their latest descendants might not be F.R. essays, or at least Fellows of the Finnion Society." On this Sir John sat down,amid great applause.

Mr. Skimmer said he thought the pedigree of *craniopsis* but indistinctly traced. On which there were cries from the audience of "Oh," and "indeed," and "really," in ironical tones; after which there was a few words from the learned Professor in reply, and the meeting separated.

The next evening meeting I was there before it commenced, being anxious to be in time, for the subject was one of special interest. It was the important one of parasites. There were two papers by Mr. Scratcher and Dr. Head, and they were illustrated by diagrams, in in which the smallest infestors of the human body were made to look yards long. There was a long list of new species, which were called after the most distinguished "Fellows of the Society." "Each man," Dr. Head said "had his attendant insect, and might well be its godfather." But this honour in these cases, he reserved for the learned few. There was *Pulex grayii*, which which frequented the grey-legged goose. On which an old gentleman in grey trousers and very grey-headed, took out his note-book and wrote down something, and shook his head very gravely. He was doubtless the grey-legged goose alluded to—the *Anser cinereus* of scientific men. Another parasite was described as infesting toothless animals, and was called in compliment to old Mr. Dent, *Dentea vulgaris*. This gentleman was toothless. Professor Specks had a large species of "B. flat," called after him; it was the *Spectea Spectabilis*; it was a full inch long, and as thick as the end of one's thumb; it had two marks like spectacles above the eyes, hence its appropriate nomenclature. Several eminent botanists had *Aphides*, or plant-lice called after them. Several eminent medical men were asked to be godfathers for internal worms, while students of Mammalia, had each a tick assigned to them, some of which had euphonius names of seven syllables. One of the "Fellows" who had hitherto sat behind, on this came forward and asked the President's leave to exhibit a large bug which he had lately caught in a lodging house, it was he thought a new species, and he had therefore handed it over to a learned friend —Professor Adam Specks—to describe, on which he sat down, and the learned friend alluded to got up and read a Report of half an hour's length, in Latin, on the specimen.

"I think it is a great privilege to have the naming of this most choice of Nature's works. I feel myself a second Adam—excuse an allusion to

my Christian name; but in all gravity it is most magnificent of its kind. I propose making it into a new genus, to be called after its most distinguished discoverer."

And the speaker paid many compliments to his learned friend, who appeared much affected. He next rose and said,

"Mr. President and gentlemen,—I beg to thank you most heartily for the patience with which you have listened to my paper on the bug, and would thank my learned friend here most heartily for the graphic and elegant way he has described it and its habits, and probable manner of taking its food, and for the most delicate way in which he has associated my humble name for ever with it." And he sat down, his voice husky with emotion, murmuring faintly that it "was the proudest day of his life."

I was much much interested in watching his face after he sat down. I never saw a countenance more redolent of content and self-satisfaction. He had evidently obtained a darling wish of his life.

At the next meeting of the Finnion Society, a paper was read giving a detailed account of natural selection. It made a deep impression on me. That night I dreamed I inverted the order of nature by standing on my head. From my feet there sprang a gorilla, and from his feet a Barbary ape, from his feet a lemur, from his feet a squirrel, from his feet a squirrel-opposum, from his feet a kangaroo, from him a duckbill platypus, from him a duck which went quack, quack, quack; from it a penguin, from the penguin a flying-fish, and so on through the fishes, till I at last found myself at a low ebb indeed, for I was nothing more than a brain-stone, trying desperately hard to develop into a brain of some sort "The force of reason could no further go," so it stopped, wondering it had lasted so long, and so there was an end of poor me. But I was not dead, so I turned round and looked at some of my companions in the Finnion Society. Professor Hammerem, having been first a hammer-shark, ended by becominga hammer-oyster, and he shut his shell, and buried himself in the mud, where he is unto this day, waiting for some power either to develop him back into the professor, or dig him up as a fossil, to illustrate a lecture on geology.

One of Professor Hammerem's brothers in the hammer-oyster stage took another direction, and eventually—strange to say—became an eminent carpenter of great proportions—a useful tool in the hands of the great genus Smith. Professor Specks ended as a microscopic inhabitant of seawater, one of the myriads that throw light on the sea; while the learned man who was godfather to the parasite of the goose, began by being *Anser cinereius* himself, and ended by becoming a goose-barnacle — that marvellous thing in nature, that well nigh irresistible link in the origin of species, which has so often been instanced in a congress of the plucked cock-sparrows of the *genus homo.*

Just then I nearly awoke from the sound resembling the cackling of geese; but being in my second childhood, I began singing, "Goosey, goosey, gander," and fell a-musing in my sleep. What a comforting theory this is! One may live as he likes now, without regard to priest or parson, and think all they have told us is lies. There is no Creator required now. Things grow just as they feel inclined; they shoot this way or that way, and as no accounts are kept of what is done, there will be no reckoning. And as for me, whether I die as a man or beast, it is all one, for the same principle of life is in all; all have the same origin. I looked straight above and I saw an immense galvanic battery

in full working order. I looked into a cup of dirty water connected with it, and there was a vegetable-cell. —oh, what "a cell" it was indeed! —which grew into some diatoms, out of which grew some duckweed. One plant of this, after many efforts and much struggle for existence, developed into a duck, then into a goose, then into an ass, and lastly into a Fellow of the Finnion Society. Another piece of duckweed, after ringing the changes in botany for a thousand million of years, eventually became a mandrake, went to college, took a degree, and afterwards, strange to say, became a bishop of a very agricultural diocese. How beautiful and wonderful these transformations are! thought I. What an improvement they are on the old laws of cause and effect! and how they entirely dispense—and most philosophically too—with the utterly obsolete code of reason and theology as has been taught for between 5,000 and 6,000 years! How honouring to man in his last days to find out so much of his distinguished pedigree! But was it not discovered before? Yes; the barnacle-goose story is an old fable. These modern imitations of it are but slight improvements. Just then I heard the cackling of geese very loud, and I awoke.

The next morning I reflected on my dream. It was not a little satisfactory, and a strong confirmation of the truth of natural selection, and a proof of the common origin of animal-life, to find that those which at an early stage of their existence clung with hooked feet to higher animals, were now devoted adherents, "true parasites" on the wealthy or influential members of the Finnion Society, I was also struck by the wonderful harmony and appropriateness of a nomenclature, by which these beautiful little creatures received the names of those distinguished men they resembled in characters and habits; so that we could not think of one without thinking of the other; and it was also delightful to see science honoured in this way, in the persons of its most distinguished professors, that great names might be handed down to posterity, which would otherwise be lost, unless thus happily associated with the *little*.

The minute atoms might well congratulate themselves on the progress they were making in self-elevation, for such is very satisfactory to the parties concerned. This vegetable cell was indeed fortunate, and in this respect, formed a pleasing contrast with man, who, instead of going forward was rapidly going back.

Several of the members of the Finnion Society had formed ingenious calculations of the period which man would take to return to the vegetable cell; there were some distinguished botanists, and more than one Anthropologist among them. The evidence they personally adduced was very convincing. One of them soon after died of Anchyolosis, or a cellular disease of the bones. Another entered a cell as a monk, as the first step in self-degradation.

I was so much interested in the meetings of the Finnion Society, that I could not help expressing myself warmly to Mr. Specks, who had been lately appointed Vice President.

"I am delighted to hear you say so, and we are very glad to have you among us, for we love to honour American talent. Cannot you give us a paper on some scientific subject, I am sure it would be most warmly welcomed by our scientific society and receive an honoured place among our transactions."

I doubted my capacity for writing a paper, but was very much flattered by some further remarks from Professor Specks.

I thought over my dream, and determined to put down all the facts

observed in it on paper, and illustrate them with diagrams, drawn partly from memory, but chiefly from imagination. I was two months employed in writing my paper, and another month in drawing the diagrams.

I had many a sick-headache over it, and was glad indeed to find it done. I sent it by book-post to the Secretary of the Finnion Society, and waited a month in breathless suspense, to know whether I should be allowed to read it. At last I saw my name announced in the papers, and two days after I drove in a hansom cab about seven o'clock to the meeting-house, where I put up my diagrams. They covered one side of the room. All my scientific friends previously mentioned were present, and a good many more unknown to fame. But I must not forget to mention the excellent Professor Snooks, the famous chemist, and Messrs. Rocks and Fossils, well known geologists. After the formal business, my name was announced, and as a distinguished foreigner, I was allowed to read my paper myself—a privilege not accorded to many. I felt proud of it, though with this pride there was mingled not a small share of diffidence. I had here an opportunity of distinguishing myself, of earning immortal renown; the eyes of all the scientific world were fixed on me, and I read the title of my paper; it was

"Recent evidence in favour of the theory of Natural Selection."

"Mr. President, and gentlemen of the Finnion Society. I do not know whether I should not have been a listener to-night, but I felt bound to respond to the many appeals that have been made to me to contribute a paper to your noble society, in support of a doctrine which I have embraced, that of the great principle of 'Natural Selection.' If I show some few of the extravagances of a new and ardent convert, gentlemen, you must excuse me. Gentlemen, let me enunciate the principle, before we go any further.

"'The weakest must go to the wall;' so Balaam was weaker than his ass. We will take the place of the donkey then, or, as I suppose I must call it scientifically, *Asinus onager*—the wild-ass gentlemen, who won't be overridden if he can help it. Ever since I heard of the great principle of 'Natural Selection,' I have been considering what evidence it rested on; and I can assure you, gentlemen, I did not accept it without a severe struggle. The greatest difficulty connected with the subject, is the want of links in the chain of evidence. They have hitherto been totally wanting, gentlemen, but I am proud to say I have discovered them. You believe, gentlemen, that man originally sprung from spawn, something like that of frogs." I paused, and voices answered, "we do certainly; most truly; that's a fact."

"Well, gentlemen, look at this diagram, here's the passage—not a link wanting, between the frog and Apollo. Is not the connection between these two proved? Certainly it is!

And if some of us say, Apollo is a mythical personage, still, do not the handsomest and most attractive men claim to be the Phœbus Apollo of their admirers;—what can be more practical than that?"

On this I was interrupted by vehement applause. "Now, gentlemen, the passage between the man and the sheep," said I, pointing to diagram No. 2, "is most irresistibly shown here. This sort of diagrammatic evidence is to me the most satisfactory of all. We can, gentlemen, make it anything we like, and that at very short notice too." There were tremendous thunders of applause. I next showed the connecting link between men and almost every class of animals, and then went into the subject of plants.

The mandrake was my strongest argument; but I had great confidence in the man-orchis, and, with the twayblade for his companion, had the geographer's great necessity, a map of the world, ready made.

In going into the subject of insects, I mentioned being at a wedding where Aunt-hill took a very prominent place, and I exhibited a very interesting and highly ornamental lady's dress, which had on the skirt a diagram, drawn to scale of the section of an ant-hill. I sat down amid thunders of applause. A learned discussion followed, in which my name was spoken of with the greatest honour, and I returned home highly elated. I shortly after received a letter, relating that I was elected an honorary member of the society, and the "proofs" of my paper, which were printed in quarto in the transactions of the Finnion Society. This was the proudest day of my life.

But I was destined to meet with a great humiliation. Two or three months after I sent in a paper, giving an account of a large number of hum-bugs I had collected in my travels, with a description of several new species, thinking that I had a great treat in store for the entomologists of the society. But what was my horror to be informed by letter, that my paper "was not of sufficient importance to be received," I went in high dudgeon to Professor Specks, and after having delicately introduced the subject, I said, "Is it true, sir, that learned societies are very shy of ventilating new views, and bitterly oppose what is original, unless brought forward by a highly popular favourite?"

Professor Specks nodded.

"And is it not true, sir, that learned societies wish to keep all their resources strictly for the benefit of cliques?"

Professor Specks nodded. Just then the door opened, and in came Professor Snooks. After the first greeting Mr. Specks turned to Professor Snooks in an apologetic tone.

"This poor fellow is in high dudgeon that his paper is not to be read before our society. But, while we pity him, I do not see that he has very much cause to complain, for he is only a corresponding member, and even regular members, out of the Finnion Club, are not supposed to have much published in our Trans. Are they, Snooks?"

"It is certainly unfair, but it is always the way with societies," Snooks said. "It is too true; the same trick was paid me when I first joined the society; and but for you, Specks, and or two more companions of the club, I should be in the same position as our friend. But cheer up, you have got on quite as well as you can expect. If you remain among us and join the club, you will soon be on the council of the society; but you must be a regular "fellow" first. I, for one, should be glad to see you one of our vice-presidents. But, old fellow, come off to the club, and we'll have a good dinner and a bottle of wine each, that will put you in spirits, if you can't get them up and talk without alcohol, and then you'll be fit to take a part in our discussion, after my paper on the contents of a flea's stomach."

I went to the club, where, like the country mouse, "I stuffed and swilled and stuffed again," and filled myself so full that I could scarcely walk; so I was glad to take the proffered arms of Snooks and Specks. But I was too heavy to take an active part in the discussion on the contents of the stomach of the flea. I wish mine had been as light. The next morning I thought of the boa-constrictor and the vulture; which of them was my ancestor? It was a much more commonplace domestic animal; it was the pig.

But even this partial success with the learned immensely raised my opinion of myself; but I was not

sure that it would raise the opinion of people in general of me. I sadly wanted some handle to my name; I must get some high or low degree. Being a married man, I thought it unsuitable to study for a bachelor's degree, so I sent a £10 note to Germany, and by return of post I got the diploma of doctor, and felt sure now of passing in America for a man of the highest attainments in science and literature.

(*To be continued.*)

THE LIFE OF A JEW VEGETARIAN.

In the year 1858, when residing at Brighton, I was invited to breakfast by a respectable and wealthy Jewish gentleman to meet some of the most distinguished adherents of the Mosaic religion. After the breakfast and about two hours interesting conversation, the host rose and said:

"Ladies and gentlemen,—I take the opportunity, since there is a considerable assembly of very wealthy brethren, to lay before you the case of one whom you all know; he has failed for the fourth time; this time for but £1,500. Everything has been sold; he is now a beggar at your mercy. There is something good in him, and for his father's sake I will stand a hundred pounds if my friends here will make up four hundred." And the old gentleman sat down.

On this a venerable Jew, well known for his philanthropy, waved his hand, and every one listened with marked respect.

"My brethren,—He is incorrigible; you know how in 1852 we subscribed £1,000 to start him in business after he had failed through neglect, going too many excursions, too much champagne, and too many horses and other costly vices, which I won't mention. And although he had started well, having his father's good business and £3,000 to carry it on, by the end of 1854 he had failed for £3,900, and did not pay 2s. 6d. in the pound. How in 1855 we started him with £950, as he said he had a novel mode of curing tobacco, which would make British made cigars equal to Havannahs, and how he broke down in nine months, and had all of his stock cleared off under a bill of sale. You will remember that I was quite disgusted with him, but that our host started a subscription a third time to put him in business, and that he failed hopelessly three months ago. Try a man or try a horse three times, if he won't go the third time let him go. I don't blame you, for you are so philanthropic and so self-denying to help the unfortunate. If you had not teazed me, I never would have subscribed to the third list, as I felt it was throwing money away. I can give our friend, therefore, no more cash or influence; if he is ever to do well he must work his way up from nothing, as many better young men have done. Stand up, young gentleman, I want to give you a scolding." On which the unfortunate got up, and the venerable Hebrew, after ten minutes praise of the father of the incorrigible, said: "If you have any respect or love for your father's memory, walk in his footsteps. No one ever took him in hand, and yet, if not as wealthy, he was as respectable as any of us, and all by his own industry. And now I won't hurt your feelings or my own by dwelling any longer on this painful matter,

but must wish you good morning, as well as the rest of the company, as I have to catch an express train to be in London at the Stock Exchange ere it closes, as I have heavy business in hand." He shook hands with the incorrigible, the host, and one or two more, and taking up his white hat, which he had left under his chair, he left the room.

The incorrigible made a short and rather lame speech in defence of himself, and after it he came and sat near me, at which I was a little surprised, but thought, as he afterwards told me, that as I was a Christian I might have more sympathy with him than his co-religionists. After a few general remarks our host said it was clear that nothing could be done for him, and that accordingly he must take a situation.

After this the company dispersed, the unfortunate leaving at the same moment as I did. We walked a few steps together, and I, out of compassion invited him that evening to tea, which being finished we adjourned to a little back room and I addressed him. "Your case is a very sad one, but I have often been the means of helping those in distress, not so much by the money that I could give them, but by the knowledge I have of human character, as taught by the system of phrenology, being useful in suggesting lines of life and mode of dealing with individuals. I have suggested pursuits and professions to many who would not otherwise have engaged in them, and although I have not had more than two years experience, yet those I have advised seem in a fair way of making a good beginning."

He listened with evident attention.

"I can tell you," said I, "about your character and disposition more than any body knows except yourself, for your character is difficult to know. You have an inordinate love of money, a strong will, a great taste for accounts; good judgment; and but for your love of the other sex and tobacco, you might have been a rich and prosperous man, But you are only thirty-two, and if you practise self-denial, which you can do, you may yet be wealthy and famous. Although I am younger than yourself, yet if you will allow me, I will give you advice in writing by which one with your talents and energy can surely make a fortune."

"If you will give me a pen and paper, I will take down all you say," said he.

Accordingly, I said "you have been spending about ten times as much on your food as is necessary, you can do without tobacco, your dress has cost you five times as much as it ought to do. Are you willing to work hard at the bottom of the ladder?"

"Yes," said he, "if I see a hope of gaining the top."

"Then by all means try. Begin by being a vegetarian. You can live comfortably on sixpence a-day, and supply all the necessaries in food on threepence a day."

After giving him some of the details of the vegetarian diet and cooking, which he put down, I paused, and he said, "How am I to start?"

"Are you willing to be a pedlar?" said I.

"Certainly, I would rather be a pedlar than a clerk. The attempt to do business in an office, and clerk's work was my ruin. My passions and energies had no development, so I sought them in pleasure. But now I have no means of getting pleasure; I have nothing on but a flannel shirt, a pair of trowsers, and a coat, and fivepence-halfpenny in my pocket. All that I could pawn I have pawned. I know not how I shall pay for a night's lodging or a breakfast. I would rather seek a refuge in the sea, and let the parish pay for my funeral, unless the crabs and lobsters saved them that expense, than

ask any more favours from the Jews. If between this and midnight I cannot resolve on any plan for life, I shall take care not to live till the morning."

"In one of the back streets off the King's Road, Brighton—I forget the name, but it is near, and I think leads out of Prince Albert Street—there is a little shop with most of the panes of glass papered up with brown paper. There is no name over the door, but I think you will be able to find it. In the window there was yesterday a lot of cheap sham cameo brooches. The setting is brass, but they are marked 2s. 6d. a-dozen. You might sell each brooch to a servant girl for a shilling; there would be a margin of profit to pay for a good deal of trouble, and you may do larger speculations if this is successful. I advise you to buy a dozen brooches, and with the wonderful power which you have of dealing with the other sex, I think you will sell them for a shilling each in a single day."

"Well" said he, "It's a good idea, but where am I to get half-a-crown for this little speculation?"

"I will give it you or lend it you, whichever you like, provided that you promise me to become a vegetarian, and renounce tobacco for the next five years."

"I give you my solemn promise that I will," said he.

"If you keep your promise I have no fear of you; you are a born financier of the first class, and you only require to find it out yourself to become one. You might become a Rothschild."

"Well," said he, pressing my hand warmly, "I will do my best. I will take no indulgence either in meat or drink until I am a rich man. If I do not succeed by self-denial, I will consider myself what my friends now do—incorrigible."

"Here," said I, "is a sovereign; repay me as soon as you can."

The incorrigible man was in tears. Seizing my hand in both his, he said, "There is a blessing in your money which there has never been in all the large sums which have been given me. It has roused me to what is in myself, and which has hitherto been obscured by tobacco. I have been an inveterate smoker since I was fourteen."

"Here," said I, "are some haricot beans. Let them last you three days, and you will find them ample sustenance."

"You shall see me in a week," said he, "at the same hour."

Punctual to the appointed hour, my friend the Jew made his appearance with a smiling face, and the first word he uttered, after a polite salutation, was, "Here is your sovereign, with many thanks for the loan of it. No money has ever done me so much good; there is a charm, there is a talisman in that sovereign, and if I could get it back I would wear it round my neck as long as I live. That evening after I parted from you I bought a dozen of those cameo brooches in that shop, which I had no difficulty in finding. That very evening also I walked round Regency Square. The first woman I addressed was a nurse carrying a child. 'What a charming baby that is!' said I, 'very like its mother.' 'It is very like its mother,' said the nurse, 'but it is not mine.' 'Well, there is a great likeness,' said I, 'between you and it, and you are as ladylike as anyone.' 'I am thought so,' said she. On this I produced my brooches, and choosing a bright-coloured one, I said I was sure it would suit her very much, and I with a smile pinned it on her shawl. 'Do let me have the pleasure of selling it to you.' At first she said she could not afford it, but soon she gave me half-a-crown for it. She was afterwards joined by another nurse, to whom I sold a brooch of the value of a shilling. Encouraged by this success, I knocked at every door in Regency Square, and sold

all my brooches. For the last two I got 3s. 6d. each from a governess, whom I tried to pursuade was a bewitching creature. I was determined that as women had cost me much money, they should pay me back all they had cost. The next morning I was at the shop door before it was open, and purchased three dozen of the brooches, getting a discount of 6d. on taking three dozen. In the course of the day I disposed of this three dozen, and before six o'clock had six dozen more; this time purchasing a small mahogany box with a tray in which to carry them. In two days I had disposed of the six dozen. This time I purchased a gross, obtaining a dozen into the bargain. Feeling the box rather heavy, considering that I had a great deal of talking to do, I hired a boy for sixpence a day, and laid in a stock of scissors, knives, cottons, and other trifles; on these I could barely get a hundred per cent. profit, but I could sell them when I could not sell the cameos. On the cameos I averaged a thousand per cent. At the end of my fifth day I was in possession of £16, £7 of which I spent in getting my watch, chain and a suit of clothes out of pawn, and the remainder I spent in a small hand cart which was drawn by the boy, and which combined the attractions of a musical box and that of a cabinet of cameos and other articles for sale. This contrivance I purchased for £3 by auction only yesterday, and I have made its cost this day, by exhibiting it on the King's road, Brighton, but I must hurry off sir. You will see me this day week on the King's road, at three o'clock, when I shall be able to tell you something." All this was said in about a quarter of an hour, and I was so bewildered, that I hardly knew what to say. I had given the Jew a table by which I had shewn him how I thought he ought to sell twelve cameos the first day he was out, at one shilling each and and that on his second day he might possibly sell twelve more on the same terms, but I never thought he would clear £16 in one week.

That day week I saw him with a crowd of customers round him. Not being a buyer I could not get a word with him for an hour, until a heavy shower drove his customers away. I had seen that his business was brisk, for he had changed a sovereign several times. "I have now got £50," said he. "I have two men besides the boy helping me, both Jews, I give them a quarter for themselves of what they get. One man earns £1 a day, the other twelve shillings."

I did not see the Jew again for three months, when I did it was on the Shoreham road, driving very fast in a sort of drag, drawn by one horse He roared "good morning" after me, but did not stop.

After the lapse of many years while I was waiting in the Royal Exchange Court yard, in expectation of meeting a man on business, I observed the Jew. We mutually recognised each other, and seizing my hand he held it for five minutes in his. He did not speak, being apparently too much overcome by emotion. At last he said, "my dear friend, I have prospered wonderfully since I last saw you, I must now go and keep an appointment, but if you come punctually at five into St. Swithins Lane, I will meet you and drive you to my home to dinner in my carriage. I will then tell you much that will astonish you." Accordingly at five o'clock the Jew met me; he took me into a courtyard, where an elegant brougham was standing. We got into it, and after driving some miles, we reached a very pleasant suburb, and entered a carriage drive, which led us, after about 100 yards, to an elegant mansion. I will not describe the exterior too minutely for obvious

reasons, but it was magnificent, and fit for a gentleman with a fortune of £100,000 per annum. The interior was, I should think, equal to that of any private house in London. There was a marble staircase, double like that in a fine club. The walls were ornamented with fine marble Mosaics; the roof was of beautiful white marble, ornamented with gold lines. My host took my arm, and led me into his dressing-room. He invited me to take a bath in a little marble bath room adjoining. I did, bathing in tepid perfumed water. I was assisted in my toilet by a French valet, who said his master requested me to put on a complete suit of black broadcloth. The waistcoat had large real coral buttons. A shirt front was given me ornamented by three very large diamond studs. Everything appeared perfectly new, and fitted me almost as if it had been made for me. I was surprised, but took everything as a matter of course. The valet showed me down to the drawing-room, where my host was. It was an elegant room, about fifty-five feet long. The walls were of marble, ornamented with prismatic and other mirrors. From the roof was suspended chandeliers formed of white and coloured cut glass. Several cabinets displayed very brilliant objects of cut stone, as fluor, jasper, malachite, and a great number of silver "statuettes," one of which was about half the size of life; it represented "Rebecca at the well." There were portraits —of course ideal—representing the twelve patriarchs, or sons of Jacob. One of the greatest treasures of the drawing-room was an ivory bound book, an illuminated history of Israel, in the missal style, which occupied seven ladies three years to execute. This was one of the finest specimens I had ever seen of this modernised art. Amongst the valuable ornaments of the drawing-room were nine small oxydised silver tables. The chairs were either wholly of ivory or of ebony inlaid with ivory. The furniture, ornaments, and decorations of the drawing-room, he informed me, had cost £30,000. Taking my arm, he led led me to the dining-room, where for two hours and a half we regaled ourselves with the most magnificent dinner I could esteem it possible to be provided for two persons. He had two superior purveyors, whose sole business it was to find and purchase for his table the most choice articles of food. £10 was not thought too much for a pine-apple, or £3 for a pear, provided it was unique in size. His bill of fare was written out very neatly every day on a card in a silver frame, and his ordinary dinner alone was not less than twenty dishes. In order to prevent injurious consequences from too liberal a use of food, he took large quantities of lemon juice, pepsine, and other digestives, and advised me to do the same, in order that I might enjoy life the better by emulating him in his liberal consumption.

The dinner was spread upon a magnificent table of solid silver, which contained three hundred weight of that metal, the table-cloth being bordered with very rich Brussels lace. I eat off plates of agate bordered with gold, and drank out of golden cups. But there was a profusion of cut-class on the table. I have seen many fine tables set, but none before or since in which there was such a redundancy of precious plate. A malachite and gold cruet stand was perhaps the most beautiful article of the kind I have ever seen. There were a dozen wine glasses on the table cut out of rock crystal, and a liqueur stand of the same precious material. The dining-room walls were of fine white carved wood, apparently of satin wood, relieved by inlaying of many coloured woods, likewise carved in relief. The chairs were either of ivory or silver oxidised.

After dinner we went into his library, which opened into his office. In an elegant carved oak frame were the instructions which he had taken down from my lips for rising in the world. They were:

1st. Be a vegetarian, as this diet is the best on the score of economy, and for sustaining the body and mind for labour, for keeping the head clear, and as a restraint imposed on oneself it stimulates other self denials, which wonderfully promote success in life.

2nd. Be an anti-tobacco, tea, coffee, and alcohol man, as all these exotics tend to weaken the nerves, dissipate time, prevent the body from getting healthy sleep, promote neuralgia, tooth ache, and discourage manliness.

3rd. Be a cold water man, bathe every morning in cold water, this will brace your muscles and enable you too resist cold and endure more fatigue than any drink or narcotic.

4th. Live as cheaply as you can. Let 10s. a week, if possible, cover all your expenses for the first year. Never exceed this amount even if you make £5 a week. If at the end of the first week your half-crown, or your pound has gained £5, and if at the end of the second week your £5 has gained £10 you may consider yourself successful. It is easy to make a profit of several hundred per cent. in an investment of a few shillings, but it is quite otherwise when investments have to be made of pounds. Therefore the poor man has advantages which the rich man cannot expect to retain. You might make cent. per cent. daily in investments of a few shillings. When your capital reached £100, I should be surprised if you doubled it in two months. When your capital reached £500 I should be surprised if you doubled it in four months; when your capital reached £1000 I should be surprised if you doubled it in six months; and when it was £2000 I should be surprised if you doubled it in a year. For large sums can only be managed to produce the extreme of profit by very keen individuals working for themselves. These keen individuals soon find they can work better for themselves than for a master, hence they soon work independently. When you employ labour, select it from phrenological principles, and above all let every one you employ in any responsible post, participate in proportion to the profits, or in some other way have some strong incentive to keen business habits."

I read this over twice in the Jew's office, and when I had done he said, "I have carried out all the precepts therein written; they are the basis of my present fortune of two millions sterling. I will now tell you some more details of my past history. But when did I last see you?"

"You were driving very fast along the Shoreham Road in a sort of small shabby looking drag, and had not time to stop, merely saying 'Good morning.'"

"I was going," said he, "to Shoreham to purchase a large quantity of horns for making combs, an article that I dealt in largely at that time. Getting the refusal of a cargo of a weather-bound ship at a certain price, I went to Birmingham, and sold them at a profit which insured me over £700. This was the first large lump sum I got, and I invested it in the purchase of six caravans and horses. I sent these round the country with one woman and two men to each. By improved arrangements with Birmingham, and buying much bankrupt stock, I was able to sell my goods cheaper than any of the other hawkers, so that the £1,200 I had when I started with the caravans, within three months had enabled me to double their number. During five years I pursued the business of a hawker, when I thought I could do better at something else which was more under my control than 70 caravans and 230 people could be. The business was beginning to be over-

done, so I sold off my stock, caravans and horses, and found with the money that I had invested, that I brought it up to a total of £30,000. I came to London and opened a money changer's, bill discounter's, and loan office. I considered it slow work, I could barely get sixty per cent. per annum for my money. But still I saw the danger of attempting to go on too fast, so I ground away at it for four years. When I had been at it about two and half years, a very yellow skinned gentleman in a Panama hat called on me one day. He only spoke Spanish, so I had to do everything with him through an interpreter. He was the agent for negotiating a South American loan, I thought that there was money to be made of it, but as I had not much knowledge of these things, I thought that I would invite to dinner an old Hebrew, one of those we met at the breakfast, in fact, the old man who scolded me. I gave him the finest dinner I possibly could, and after the cloth was removed I made a speech in which I complimented him, and recounted my father's friendship for him, that I had had a loan offered me, but I felt I could not go into it unless I had powerful support. Would he and his friends join me in it? I would stake £50,000 in it myself. The old Hebrew made a hundred difficulties. He, however, invited me to dinner the next day, the first time I had been in his house since I was a boy. We had four hours talk the next day about the loan. The old gentleman was interested; our conversation was interrupted, however, by a third party. As the weather was very hot in London I proposed that I should take a furnished house at Brighton, and that he should spend a week with me, and that we should study the matter thoroughly. In that week we settled the business; the loan came out; my friend made £150,000 by it; I made £250,000; it was profitable to many others in a less degree. My friend next proposed that I should have three rooms in his City office, and that we should work together at loans and the promotion of joint stock companies. By these speculations, great or small, I have made the fortune of two millions which you now see, which would have been impossible but for the self-denial which I practised through your advice. Until I was a rich man I never tasted meat or put alcohol or tobacco near my mouth. From the time you saw me until I had over a hundred thousand pounds the average cost of my dinner did not exceed 6*d.*, or the annual cost of my dress £5. My lodgings, at first 5*s.* a-week, rose in cost with my means. Cleanliness and good air being necessary to health, I always adhered to them. I am one of the few Jews who can swim well. When I found myself in possession of a million sterling I thought I would have a house a little out of town, and so I got into this house, which I gradually remodelled to the present state of elegance in which you see it. I have, as I told you, never been married. On my possessing a million I proposed to a wealthy Jewish heiress; but being rejected by her, I am resolved to remain as I am. I have had great bargains of my household things. A ship from Italy, laden with marble, was sunk in the Thames. I purchased her for a few pounds, and raised her, so that the marble in my house, instead of costing £30,000, only cost about £500. All the silver tables were manufactured in London for an Indian prince. The jeweller was glad to take 6*s.* 6*d.* an ounce for them, so difficult was it to meet with a customer for such costly goods. And now, in what way can I show my gratitude—the gratitude of my life—to you. The Jew was as good as I had reason to expect. He treated me like a prince, how, I must not relate.

TOBAGO, THE ISLAND OF ROBINSON CRUSOE, IN WHICH THE WORK OF DE FOE IS PROVED A REALITY.

DANIEL DE FOE'S great work, "Robinson Crusoe," has excited more interest than any work of a similar class, and for the simple reason that while it professes to be a work of fiction, it has about it such an air of truth and reality, as to give the reader the impression that it is itself a true narrative. This power is usually attributed to the genius of De Foe, whose glowing imagination enabled him to see reality in fancy. But the object of this little paper is to show that Daniel De Foe was, as regards the main and most striking incidents in his story, guided by a narrative of facts.

In "Robinson Crusoe" we read (Bohn's edition, page 31), "About the 12th day, the weather abating a little, the master made an observation as well as he could, and found he was in about 11 degrees north latitude, but that he was 22 degrees west longitude from Cape St. Augustine, so that he found he was got upon the coast of Guiana, beyond the river Amazon towards the river Orinoco. We steered north west by west in order to reach some of our English Islands, where I hoped for relief, but our voyage was otherwise determined, for being in latitude 10 degrees 18 minutes, a second storm came on which drove us out of the way of all human commerce, that had all our lives been saved as to the sea, we were rather in danger of being devoured by savages than ever returning to our own country. In this distress, the wind blowing very hard, one of our men, early in the morning, cried out, "Land!" and we had no sooner gone out of the cabin to look out, than the ship struck upon a sand."

The only island to which this situation is applicable is Tobago, whose shores are washed by a current from the great river Orinoco, and is in latitude nearly corresponding.

When Robinson Crusoe was greatly depressed in spirits for fear of savages he was relieved by the discovery of "a natural cave on the earth, which went in a vast way and where, I daresay, no savage, had he been at the mouth of it, would be so hardy as to venture in; nor, indeed, would any man else but one who, like me, wanted nothing so much as a safe retreat. The mouth of this hollow was at the bottom of a great rock, where by mere accident (I would say, if I did not see abundant reason to ascribe all such things now to Providence) while I was cutting down some thick branches of trees to make charcoal I perceived that behind a very thick branch of low brushwood or underwood, there was a kind of hollow place. I was curious to look in it, and getting with difficulty into the mouth of it I found it was pretty large, that is to say, sufficient for me to stand upright in it, and perhaps another with me, but I must confess to you that I made more haste out than I did in, when looking farther into the place, and which was perfectly dark . . . I found the cave was but very small, that is to say, it might be 12 feet over, but in no manner of shape, neither round nor square, no hands having ever been employed in making it but those of mere nature. I observed also that there was a place at the farther side of it, that went in further, but was so low that it required me to creep upon my hands and knees to go into it, and whither it went I knew not, so having no candle I gave it over for that time, but resolved to come again the next day, provided with candles and a tinder-box, which

I had made of the lock of one of the muskets, with some wildfire in the pan. Accordingly the next day I came provided with six large candles of my own making (for I made very good candles now of goat's tallow, but was hard set for candle-wick, using sometimes rags or rope-yarn, and sometimes the dried rind of a weed like nettles), and going into this low place I was obliged to creep upon all fours, as I have said, almost ten yards, which, by the way, I thought was a venture bold enough, considering that I knew not how far it might go, nor what was beyond it. When I had got through the strait I found the roof rose higher up, I believe near 20 feet, but never was such a glorious sight seen in the island, I dare say, as it was to look round the sides and roof of this vault or cave. The wall reflected a hundred thousand lights to me from my two candles. What it was in the rock, whether diamonds or any other precious stones, or gold—which I rather supposed it to be—I knew not. The place I was in was a most delightful cavity, or grotto, though perfectly dark. The floor was dry and level and had a sort of a small loose gravel upon it, so that there was no manner of nauseous or venomous creature to be seen, neither was there any damp or wet on the side or roof; the only difficulty in it was the entrance, which, however, as it was a place of security, and such a retreat as I wanted."

Lieutenant Colonel Cappadose, in his "Sixteen Years in the West Indies," says, "On the 12th of October, I went with a party to visit Robinson's Crusoe's cave, which lies on the south-western coast under Crown point, opposite Trinidad. The roads to it, conduct, one near the other, along the beach (take the former good reader, should you visit Tobago), to Sandy Point, then leaving the Estates of Cove, Friendship, and Kilgwyn to the left, and Bon Accord on the right, you ride about a mile and a half further to an extensive pasture land, forming a large estate called Cronstan. Across this pasture and below the cliffs over the sea is the cave; and to get to it you now require the use of your hands as well as feet to crawl down the craggy ridge; after winding a little distance over uneven ground adjoining the beach, a slight ascent must be made; holding on by hands, and grasping projecting rocks to attain the mouth of the cave, into which the descent, though not deep, must be made with caution, the entrance being narrow, the ground within very craggy and broken with rough masses of loose and fixed rock or stone, whilst the roof is studded with long pointed spars or nobs of a sharp kind of rock or stony substone, to avoid knocking the head against which, the explorer must stoop low in groping his way into the cave. These points, some of which are thinner than the rest, resemble long icicles, and are supposed to have been formed by the rain, or the waves of the sea, during boisterous weather, breaking over the cave, oozing through the pores of the roof, becoming congealed, and thus forming petrifactions; some are very brittle and yield to the force of the hand, others require a hatchet to disunite them, externally they are dull, but when cut or broken sparkle brilliantly. This cave is about twenty feet long and ten broad, but the extreme end of the aperture, is only large enough to admit a very small animal. The aperture, in the opinion of many, leads to a considerable extent, but this is only conjecture. The height is sufficient for the tallest man to stand upright, though it is difficult to find footing, the ground being so rugged and uneven as to oblige visitors to cling by the large fragments of stone or rock. In one spot there is a natural

banquette, just admitting a single person to be seated. It would be no very difficult matter to clear the floor, make an easy entrance, and cutting steps down the cliff enable visitors to resort to it. Between the mouth of the cave and the sea is a large cliff, which renders the cave very dark, though it in some degree protects it from the waves. For the purpose of exploring, it is requisite to be furnished with lights and several fragments of rock are so formed, as to serve as scones for the tapers; when thus illuminated the effect is very grand."

There are but slight differences between De Foe's account, and Colonel Cappadose's description, such as might be expected to occur in the lapse of years, and the growth of the stalagmite with which it was evident the floor of the cave was covered.

Colonel Cappadose speaks of a narrow passage, which led he did not know where. This Robinson Crusoe explored and found it led to a second cave. The Colonel suggested that a little excavation would probably clear this passage which has been probably filled up, if we are to take De Foe's description perfectly literally. A young lady told the author that she had visited this cave still more recently, and was struck with the accuracy of De Foe's description of it.

We shall now call attention to some other points, in which, Robinson Crusoe's story agrees with the topography of Tobago.

On comparing the best maps of Tobago with Robinson Crusoe's account, we think that his ship was wrecked on the Minister Rock, which is nine fathoms at low water, and which lies off Baccolet Point, a little to the east, that he landed some where in Minister Bay, and passed his first night in one of the trees, now mostly cut down near the beach. When he came down from his apartment in the tree, he saw the ship's boat about two miles on his right hand. This was probably in Rockly Bay, near where the town of Scarborough is now situated. When Robinson was guiding his raft, he found himself in the mouth of a little river with land on both sides, and a strong current or tide running up. "I looked on both sides for a proper place to get to shore, for I was not willing to be driven too high up the river; hoping in time to see some ship at sea, and therefore resolved to place myself as near the coast as I could. At length I spied a little cove on the right shore of the creek, to which, with great pain and difficulty I guided myself, and at last got so near, that reaching ground with my oar I could thrust her directly in. But here I had like to have dipped all my cargo into the sea again; for that shore lying pretty steep—that is to say sloping—there was no place to land, but where one end of my float, if it ran on the shore, would lie so high, and the other sink lower as before, that it would endanger my cargo again. All that I could do, was to wait till the tide was at the highest, keeping the raft with my oar like an anchor, to hold the side of it fast to the shore, near a flat piece of ground, which I expected the water would flow over, and so it did. As soon as I found water enough, for my raft drew about a foot of water, I thrust her upon that flat piece of of ground, and there fastened or moored her, by sticking my two broken oars into the ground, one on one side, near one end, and one on the other side, near the other end; and thus I lay till the water ebbed away and left my raft and all my cargo safe on shore."

Hillsborough bay, and Hillsborough east river, were most probably intended, and the place he first excavated for his dwelling place was on the side of Mount St George, as it is now called.

Crusoe notices goats on the island. Two hundred years ago, these abounded in Tobago, but they are now extirpated in a wild state. Crusoe killed wild cats; these are the oppossums of Tobago, which were known to the early settlers by this name. He says, "Coming back by the sea shore I saw many sorts of sea fowls which I did not understand." The shores of Tobago greatly abound in sea-fowl in the present day. Crusoe mentions the hard woods, for which Tobago is famous, as also the pigeons and parrots, with which the island abounds. Robinson Crusoe threw away some grains of barley, which to his surprise, sprung up as he thought the climate was not proper for corn. Whether it is a reality or a delusion, the present settlers have a notion that wheat and barley are not suitable crops for Tobago. Robinson Crusoe caught a turtle. Turtle are now one of the staples of Tobago. He went up the river or brook where he landed his rafts, "and found on the banks of this brook pleasant savannahs or meadows covered with grass; and on the rising parts of them, next to the higher grounds, where the water, as might be supposed, never overflowed, I found a great deal of tobacco, green and growing to a great and very strong stalk; there were divers other plants which I had no notion of or understanding about, that might perhaps have virtues of their own which I could not find out. . . . I saw large plants of aloes . . . several sugar-canes, but wild for want of cultivation."

This description of the botany is quite characteristic of Tobago two centuries ago, and the savannahs are now found in the same place.

The next day he went up the same way again, "and after going something farther than I had gone the day before, I found the brook and savannahs cease, and the country became more woody than before. In this part I found different fruits, and particularly I found melons upon the ground in great abundance, and grapes upon the trees; the vines had spread indeed over the trees, and the clusters of grapes were just now in their prime, very ripe and rich. This was a surprising discovery, and I was exceedingly glad of them; but I was warned by my experience to eat sparingly of them, remembering that when I was ashore in Barbary, the eating of grapes killed several of our Englishmen, who were slaves there, by throwing them into fluxes and fevers. But I found an excellent use for these grapes; and that was, to cure or dry them in the sun, and keep them as dried grapes or raisons are kept, which I thought would be, as indeed they were, wholesome and agreeable to eat, when no grapes could be had."

Grapes are notoriously one of the most abundant fruits of Tobago, the species (*Cocoloba Uvifera*) being, however, different from that of Europe, the trees being most abundant by the sea-side. The common vine of Europe (*Vitis Vinifera*) is also known in Tobago. Robinson also speaks of cocoa, orange, lemon, lime, and citron trees, all of which are abundant in the island. The orange, lime, lemon, and citron were transported there from Europe, shortly after the island was discovered by Columbus, by the few settlers who were afterwards extirpated by the Charaibs.

The place where he found the grapes was probably in the parish of St. Mary. The place where he first settled was not the best locality for turtles, which is true enough of the south side of Tobago, but he speaks of their great abundance on the opposite side of the island, which is also quite true as regards Tobago in the present day.

Crusoe speaks of the rainy season

being in September, also true as regards Tobago. Crusoe mentions making earthernware pots of clay; brick earth fit for this purpose is abundant in Tobago. He felled a cedar tree 5ft. 10in. in diameter in thc lower part next the stump, with which he formed the long boat which he had not strength to launch. There is no island in the world where cedar trees of this kind are more common than Tobago.

Another very striking point of correspondence is in the current which is equally characteristic of Robinson Crusoe's account and the hydrography of Tobago. He says, "I perceived a strong and furious current which ran to the east and even came close to the point; and, I took the more notice of it, because I saw there might be some danger that when I came into it I might be carried out to sea by the strength of it, and not be able to make the island again; and indeed had I not got first upon this hill I believe it would have been so, for there was the same current on the other side of the island, only that it set off at a further distance, and I saw there was a strong eddy under the shore; so I had nothing to do but to get out of the first current, and I should presently be in an eddy. On the third I came to the point where I was not even my boat's length from the shore, but I found myself in a great depth of water and a current like the sluice of a mill. It carried my boat along with it with such violence that all I could do could not keep her so much as on the edge of it; but I found it hurried me farther and farther out from the eddy, which was on my left hand. There was no wind stirring to help me, and all I could do with my paddles signified nothing; and now I began to give myself over for lost, for as the current was on both sides of the island, I knew that in a few leagues' distance they must join again, and then I was irretrievably gone. Nor did I see any possibility of avoiding it, so that I had no prospect before me but of perishing—not by the sea, for that was calm enough, but of starving from hunger."

On referring to the Admiralty charts of the island of Tobago, a strong current in the directions here indicated is plainly laid down.

From this it is clear that the author was describing one of the Carribee Islands, which the latitude and longitude prove to be Tobago.

Some literary scribblers anxious to graft their little reputations on a great one, have endeavoured to prove that De Foe was guided in the main features of his story by the narrative of Alexander Selkirk, who was placed by an unkind captain on the shore of Juan Fernandez, an island situated far out of the latitude and longitude of De Foe, and far from the reach of the Charaibs, whose incursions on the island of Robinson Crusoe form a striking incident in De Foe's book. This very island of Tobago was frequently visited by Charaibs as will be shown hereafter.

Another discrepancy between the history and the story, is in the fact of Selkirk being put ashore on Juan Fernandez, and Robinson being shipwrecked on his island. We have clearly to do with two distinct stories.

In the year 1600 a Dutchman was shipwrecked on the island of Tobago and remained there eighteen years, living in comparative comfort on the natural productions of the island. There are several versions of his story. We will give the one which has been traditional in the family of the author, and which is generally believed in the island of Tobago. It may be as well to state that the author's grandfather, about 1768, went out from Scotland to Tobago, and that his descendants have been closely connected with the colony ever since.

The Dutchman aforesaid was ship-

wrecked on the Minister rock, a sunken rock on the south side of the island. He made his way to shore on a raft constructed of part of the material of the ship, and wandering about in search of shell fish on the beach, he discovered a cave, which is situate on the Crown Point, and is now known, and has been known for the last century, as Robinson Crusoe's Cave. Not that a person of this name ever resided there, but that the narrative of the Dutchman is believed to be the foundation of De Foe's work.

Captain Poyntz, in his "Present Prospects of Tobago," published in London, 1663, thus speaks of the miraculous preservation of Otto Eden, a Dutchman, who fled from persecution from the Colony of Surinam in a small vessel :—"Being a stranger, he had no bread to eat, and his half-famished children, crying to him for food, he was deeply depressed, when an Indian who had fled with him cut down a tree, and made a sort of pudding by boiling the pith, which, when pounded into flour, was capable of being made into cakes resembling Dutch wheaten biscuits."

This tree was called the macaw, and is the *Agrocomia fuciformis* of botanists.

This pith was very analogous to that of the Sago palm of the east, and the Dutchman was probably the—

"Old man of Tobago,
Who lived on rice, sugar, and sago,
Till the doctor one day
Unto him did say,
To a roast leg of mutton you may go."

There was a later hermit in Tobago, in the person of a Frenchman, who was found living there in 1777 by the ship "Sterling Castle." He said he had been there twenty-one years.

THE ROYAL ACADEMY EXHIBITION, 1878.

THE Royal Academy opens, like spring, with May flowers which have been prepared during many months or years, ere they are ready to bloom on the walls. Every year has its especial characteristic. Some years are characterised by finer and brighter flowers, yet there is a perennial beauty about all. There is much false taste in modern as amongst ancient painters, who often meanly attempt by little tricks worthy of clever yet small minds, to court the favour of patrons by the sacrifice of the truths of Nature. One of the objects of this essay will be to endeavour to recall such painters to the more solid paths which lead to permanent reputation. Artists are an impressionable race, for their very pursuit is more imitative than science, or perhaps those useful arts which supply us with the necessaries of life. Still, while imitation is in itself a necessary faculty, yet it should be exercised rather as a means of bringing man in sympathy with what is beautiful and good, than as making him the servile mimic of the noblest. It has been said that there is "no failure so great as the imitation of a success," and it is certainly true that although a mimic may attain a portion of the notoriety which has more legitimately been carried by his model, yet his reputation being based on that of his model must fall with it, having no individuality, he cannot claim to have an individual existence. It is to be feared that most artists and most literary and

even scientific men, are so attracted by the seductive charms of art, or the writings of their more enterprising literary or scientific brethren, as to follow in the grooves they have made. Hence the formation of schools of art or thought which, by the cultivation of art apart from Nature, lead to the perpetuation of error. The great models which lesser artists desire to emulate, owe their greatness to the study of one model—Nature; to follow in their footsteps they must follow their model, Nature. The little-minded artists, hoping to achieve a great reputation without the great labour necessary for such attainment, mimic the productions of others. Schools of Art, while they teach the different methods of producing an effect in the shortest possible time, and show how the different living and dead objects should be drawn, yet should aim to reproduce Nature rather than to reproduce other works of art, however great and glorious they may be. Although mimicry is the prevailing characteristic of second class paintings, and is often a means of preserving works from utter neglect, as giving a kind of lunar halo derivable remotely from a greater sun, yet on close examination of these pictures, glaring defects are the more visible, which are seen when the halo has ceased to fascinate. Remove these rays, and the painter's shallow individuality is left. But why should such a stage be reached? It is merely because the artist has strayed from the path which Nature intended him to follow, which may be either from pernicious reflections or from pernicious teaching. At whatever cost let such artists come back to Nature at once, and let the younger artists profit by their failure. Many an artist might have succeeded as a still life painter who fails as an historical painter. Many an artist by courting the favour of shallow patrons sacrifices his genius.

Some artists are incapable of excelling as painters, who would be admirable as engravers or draughtsmen in black and white, yet patronage seduces them early in life from their true path. Other artists are injured through a facility in rapid production, inducing them to attempt quantity rather than quality; forgetting that nature presents objects in a high state of finish, and when that is not perceived it is through the defect of the vision of the observer. In estimating truly the merits of such an exhibition as the present, which aims to represent life in all ages, under every alternation of season and time, the critic must be profoundly versed indeed who would be competent to say in all cases, this is right or this is wrong. Yet the eye that for more than a quarter of a century has closely studied nature, may give the artist many hints, more especially if he is a naturalist as well as an art critic, and free from the slightest suspicion of jealous apprehension of the success of the votaries of any school.

"The daughters of Edward Holden, Esq,," by Mr, S. Sidley, No. 4, represents two young girls playing with a pair of turtle doves in a conservatory. The girls are of fair complexion, and the scene is one which harmonises well in colour, there is a lilac tone about it that is pleasing. "A showery day," No. 20, by Mr. Vicat Cole, is a picture more distinguished for good general effect than high finish.

"The Princes in the Tower," by Mr. J. E. Millais, R.A., represents them in the conventional black velvet dresses, the elder wearing the garter. This is a pleasing and graceful picture, natural, but with nothing powerful, the common place fair boys are such as would neither particularly adorn nor disgrace any gentleman's house. No consciousness of impending fate is expressed, no thought that youth must confine its springs to its prison. The clever

Dutchman, Carl Rodeck, has sent a grand forest scene, "Evening," No. 9. Nature and art are married here, the sun dances as only the sun can dance on the bark of the trees, gild-them with a brightness far more exquisite than that of metallic gold. Mr. J. Sant, R.A.'s portrait, No. 27, of Mrs. Surtees, of Redworth, has but languid interest except for those who can judge of its merits as a likeness, although pleasing enough as a portrait of a fashionable lady. Mr. Holyoake's, No. 39, "Richard Savage," represents one of those shiftless individuals whose career was full of vicissitude. He was the illegitimate son of the Countess of Macclesfield, by Earl Rivers, and was brought up without a knowledge of his parentage. His mother represented that he was dead, in order that his father might leave him nothing. In a drunken quarrel he killed a man and was condemned to death. His mother tried to get him executed, but he obtained a reprieve. He was a distinguished poet, but his pen did not gain him a livelihood, so that at last he had to beg his bread. He is most powerfully represented by Mr. Holyoake in a ragged court dress lying down to sleep under the piazza of Covent Garden.

No. 40, "Careful as a mother," by Mr. Jas. Hallyar, is a fine piece of tender expression. In a cottage a grandfather in a white blouse is preparing to feed an infant child dressed in a red frock. A soft, green-yellow light from the foliage of spring comes in at the window, which is partly shaded by a brisk goldfinch in a cage. "Zenobia captive," No. 43, by Mr. E. J. Poynter, R.A., is a fine figure magnificently attired in shawls, with a crown of gold, and yet wears the chain of captivity. She was a military heroine who conquered Egypt, but was subdued by the Emperor Aurelian. The Romans at one time gave her the title of Augusta, but she died a prisoner at Rome. For powerful drawing of the arm and the exquisite colouring of the dress this painting might adorn any gallery. Zenobia was equally distinguished for literature as for her bravery, and she may rightly be esteemed as the greatest heroine of antiquity, but deficient force in the countenance, both moral and intellectual, make us wish this picture, notwithstanding its great merits, had another name. "Home, sweet home," No. 64, by D. Leslie, R.A., represents five girls in a school-room listening to an elder one playing on a piano, which from its make and the costumes of the girls is a vivid reproduction of sixty years since. No. 70, "A country cricket match," by Mr. John R. Reid, might have been a slight sketch by Frith. Rustic life is vividly pourtrayed, but with less finish and care than the subject demands.

"A Trumpeter," No. 102, by the Court painter, Mr. H. Weigall, represents in bright colours one of the most striking appanages of a Court procession. A handsome Englishman sits well on a white horse. "An Eastern Question," No. 97, by Mr. J. E. Hodgson, shews an interesting converse between two English sailors of our fleet and three Turks, one of whom from his green turban may be taken to be a descendant of Mahommed. "The Cornish Lions," No. 105, by Mr. John Brett, is a picture which shews a photographic-like reproduction of the minute details of the highly coloured group of rocks, which have long been considered to resemble in form the king of beasts. These resemblances in nature are not a little curious. Queen Elizabeth's rock, Cornwall, shows a striking portrait of the great Bess. "The summer sea in the Scilly Isles," No. 110, by Mr. John G. Naish, is a most truthful transcript of rocks, clothed with seaweed in augmentation of their own natural brightness

of hue. There the Cormorant sits, solemn, yet ready to dive into the sea. No. 111, "After an entomological sale," by Mr. E. Armitage, R.A., expresses the exultation of a group of gentlemen in the happy possession of a rich store of fine insects. The sale room reminds us of that of Mr. Stevens, but it is not an exact reproduction of that place. "Autumn in Switzerland," No. 122, by Mr. B. W. Leader, is a truly grand landscape most highly finished. In the back ground are seen snow-clad mountains in every gradation of iron grey. A valley lined with fir trees, at the bottom of which runs a stream. In the foreground is a large stone covered with green moss and lichens. Nature here wears her fullest summer dress, and looks her very best, yet all is still. Not a fox rustles by. Not a bird with quivering wings stirs the air.

Painters of cows have rarely been more happy than Mr. Edwin Douglas, in No. 99, "Milkmaids and Marguerites." The beautiful little Breton cows which produce the Brittany butter move joyously along a daisy pied meadow. "The Gods and their Makers," by Mr. E. Long, No. 129, is a useful resurrection of ancient Egypt; the figures are of the natural size. There is but little life and action in them, perhaps because the subject is so essentially ideal. Mr. Alma Tadema is more successful with this class of subjects in imparting to them animation, but is accused of being theatrical. Mrs. L. Jopling is successful in her portrait of Mrs. James Tomkinson, a graceful and pleasing young lady in a dark green dress, who is about to take a cup of tea out of genuine blue Nankin porcelain.

No. 154, "Major Brown and the Northumberland Hounds," by Mr. Y. E. Luyens, is a presentation picture from sporting friends, more artistically treated than is usual. A hunting party is crossing a ford against a back ground of pretty trees. Mr. S. Taylor Whitehead's portrait, 204, by Mr. J. Petty, R.A., is life-like, although the costume, that of Venice of the Tudor age, is scarcely suitable to any other place but the stage. Mr. B. Riviere, No. 202, depicts an Assyrian scene.

> "They say the lion and the lizard keep
> The courts where Jamshyd gloried and drank deep."

This picture may almost be said to be painted in *grisaille*, so cold is the gray twilight it represents. In one respect it is false, however, as the lizards do not go abroad at night. "The Cities of the Plain," No. 210, by Mr. E. Armitage, R.A., represents the patriarch Abraham standing on a mountain, from which he looked down on the destruction of Sodom and Gomorrha (Gen. xix. 28). There is nothing grand about the treatment, and the colouring is crude. "Estes Park, Colorado," No. 230, by Mr. Albert Bierstadt, is as fine as possible, and is a scene comparable to the grandest in the European Alps. On the right hand side are rocky mountains, on the left the big horn or mountain sheep roams.

A dream of ancient Egypt, No. 242, "The Morning of the Exodus," by Mr. Andrews Macallum, is a fine piece of ideal landscape painting, reminding us of Martin. For bold effect of light and artistic management of large groups of figures this landscape is highly successful.

Mr. George A. Holmes exhibits a study of two young brown owls, just emerged from the downy plumage, hence this is rather improperly termed "Courtship," but as they nestle close together on the same perch it might have been termed fraternal love. "Only a School Girl," No. 17, by Mr. Patrick W. Adam, is a most easy, natural, and powerful representation of a plainly dressed young girl of the period, infinitely more valuable than much of the fashionable portraiture on the same walls.

Mr. C. N. Kennedy's "The new

toy," No. 8, shows a number of young girls gazing at a Chinese lantern, which illumines the room where they are, after the shutters have been shut. The rays of the lantern radiate well, the grouping is natural, but the young girls have rather a stupid expression.

"Before the busy hum of day," No. 12, by Mr. J. Watney Wilson, is a sweet rendering of that misty morning which so frequently precedes a fine, warm day.

"Lady Ackland," by Mr. Cyrus Johnson, No. 7, represents the face of a country lady advanced in years but full of religious, quiet goodness and thoughtfulness about the wants of others. "The meeting of Scottish Jacobites" is by Mr. Claude Calthrop, No. 10. "It was in 1740 that seven daring Scottish Jacobites associated themselves together to risk life and fortune for the restoration of the exiled Stuarts." Sturdy fellows these are as they sit in conclave at the table, one standing guard at the door. It is a powerful and interesting picture. "Fallen," No. 16, by Mr. A. Parsons, represents a tree felled over a river in which water lilies float, painted with true rural feeling, a picture calculated to adorn a London house, by bringing the beauties of the country with an undying freshness to town.

"Mrs. Bayley Worthington," by Mr. P. H. Calderon, is conspicuous for little else but mediocrity. A painter of genius is no way so much injured as by being obliged to bend to the caprices of wealth and insipid models, who, making the most of themselves, expect the painter to do the same for them.

"Waste land," No. 28, by Mr. J. Aumonier, is a most clever rendering of a luxuriant growth of many-coloured weeds on a cliff overhanging the sea. Beautiful sea gulls hover over the horizon and give animation to the scene. Here are the beauties of the Pre-Raphaelite school, captured by one whose delicate hand does not destroy the fine gradation of tone which the usually mottled sky of England throws even on the brightest tints. "Upon the Cuchullon hills, Isle of Skye," No. 112, by Mr. T. S. Cooper, R.A., is with No. 335, "Modern occupants of an ancient tenement," a vivid representation of sheep life, and sustains the already established reputation of this painter as a most truthful and highly-finished delineator of these beautiful animals in which he greatly surpasses Landseer, and rivals in the mere animal forms Verbeckhoven. "And when did you last see your father?" by Mr. W. F. Yeames, is a question addressed by an inexorable Roundhead to a little boy dressed in light blue. The scene is laid in the house of a Cavalier in occupation of the troops of the Long Parliament. The female members of the family are overcome with grief. It is a picture from its expressiveness and historical appropriateness that will be remembered. Of pure sea pieces none in this exhibition have near the importance and value of "The Cleopatra in the Bay of Biscay," No. 330, by Mr. E. W. Cooke. In the memorable storm of the 14th of October she is signalling the Olga to cast off the tow-rope. The waves have a look of reality which portends mischief as they rise to an unwonted height. Waves have not been better painted by Turner or Clarkson Stanfield than by Mr. Cooke. What a contrast is this scene of a rough sea to that of the quiet "Convent garden," No. 335, of Mr. F. S. Walker. On the right hand side is a group of nuns, demure and grave, on the left is a shaded grass plot, rich with shadows which express luxuriant coolness and deep repose.

"A gloomy sadness shadows all the scene,
Shades every flower and darkens every green."

"John Alden and Priscilla," No. 350, by Mr. A. Elmore, R.A., illustrates Longfellow's "Courtship of

Miles Standish," an uninteresting flat poem. The expenditure of the genius of painters can scarcely galvanize into life such works of literature, which appeal only to the weakly sentimental instincts of mankind. "Rush gathering," No. 381, by Mr. W, S. Lloyd, is one of those simple transcripts of rural life which are pleasing in a great gallery, but which are comparatively unimportant.

"From out the corridors of time," No. 399, by Mr. R. Blewitt, two studies combined in one picture, represents glass cases in the British Museum. On the left hand, cases of mummies are painted, on the right some vultures. The objects are well copied, and may suggest to the passer by, two ways in which the dead of Egypt may be disposed of.

One of the most life-like portraits is that of Mrs. Williams, No. 404, by Mr. T. A. Wirgman. No attempt is here made to give a conventional beauty to the face at the sacrifice of the chief beauty in a portrait, character. Here is a widow in a widow's cap who has seen sorrow, and whose countenance is her history.

Artists if they would live must study to reproduce the questions of the day, hence it is not surprising that many illustrations of Oriental life should adorn the walls of the Academy, at a time when Eastern politics occupy men's minds. "Shopping at Constantinople," No. 408, by Walter C. Horsley, a capital rendering of an Eastern bazaar, is an attempt to meet this want. The light is most skilfully managed. "An Eastern puzzle. Chinese Lama, priests at home," No. 416, by Mr. N. Chevalier. If these are mountaineers their complexions are not too pale; they are very different from the lemon-skinned natives of Southern China. No. 423, "Newgate—committed for trial," by Mr. Frank Holl, represents certain poor individuals in "the cage," in which they are shewn to visitors. There is not much here that is self explanatory; no sermon is preached on the title. "Beauty and the Beast," No. 434, by Mr. C. Burton Barber, represents a peacock, and a sow, and litter of pigs in the stable, the contrast is sufficiently great.

Mr. Henry Irving in the character of Richard Duke of Gloucester, in his sabled robes, is at once a powerful and a faithful likeness, and one which might be with advantage added to the National Portrait Gallery, or the South Kensington Museum. In analysing works of art, we may enquire whether or not they would make popular engravings. If there is not sufficient story-telling capacity about them to attract the popular eye, their merits must be great in colouring, or else they can please but few. "The Dedication of the Infant Samuel by his Mother Hannah," by Mr. Soloman A. Hart, R.A., is one of the greatest failures in the gallery. The colouring is glaringly brilliant, and the life-size of the figures and the time spent on it, render it a sad instance of wasted human labour. Still there are those who from respect for the subject, would be willing to buy such a picture. The three bullocks brought as an offering with the child, and the servant in charge of them are fearful failures.

This Exhibition will be chiefly remembered in connection with Mr. W. P. Frith's Hogarth's like series of "The Road to Ruin." The hero of the five pictures Nos. 291 to 295, is an example to be avoided, not followed. Beginning life as a gentleman student at college, he is the principal figure at a gambling wine party, pursued through the hours of the night, until the lights grow dim in the light of day. He is equally conspicuous at the grand stand at Ascot, wearing a fashionable, nearly white, coat. The next picture sees him married, surrounded by every luxury, the father of a family, but arrested for debt. The next sees him struggling in a lodg-

ing at Boulogne. He has sent in a play which has been rejected. His wife has not been able to sell the paintings on which she depended for support. A garrulous landlady clamours for the payment of her bill, while the children, unaware of the gravity of the situation, amuse themselves with the toys on the floor. The last scene is the most painful if less powerfully painted than the preceding. A garret is his only room, an empty cradle is a sign of despair. The man bolts the door, a pistol lying on a table significantly points to his end. The following lines, by William Hogarth, the painter, are most forcibly illustrated :—

"Happy the man whose constant thought
(Tho' in the school of hardship taught)
Can send remembrance back to fetch
Treasures from life's earliest stretch;
Who self approving can review
Scenes of past virtue that shine through
The gloom of age, and cast a ray
To gild the evening of his day.
Not so the guilty wretch confin'd;
No pleasures meet his roving mind;
No blessings fetch'd from early youth,
But broken faith and wretched truth,
Talents idle and unus'd,
And every gift of heaven abus'd,
In seas of sad reflection lost,
From horrors still to horrors tost.
Reason the vessel leaves to steer,
And gives the helm to mad Despair."

From grand delineations of human character in the path of sorrow and of shame, the mind naturally turns for relief, not perhaps to a scene of violent hilarity, for such a contrast would not please, but to a twilight well rendered, as is No. 209.

"'Tween the gloamin and the mirk
When the kye come hame."

A most creditable work of Mr. Farquharson's. It is a subject well worthy of the consideration of art critics, whether it is legitimate to draw Nature as seen by the clearest or the indistinct vision. Some eyes penetrate the gloom and see forms distinctly, which to others are almost invisible.

"Unto me all the unseen is visible and clear."—*Longfellow.*

One of the most affecting pictures of this year's exhibition is No. 241, "Lieutenant Cameron's welcome home from his explorations in Africa," by Mr. G. W. Cope, R.A. The memorable expedition of this intrepid explorer occupied the years 1873, 1874 and 1875. He was supposed to be lost in the dark continent. His mother alone was sustained by hope. Although of Scottish descent his father was vicar of Shoreham, Kent. On his arrival being known, the inhabitants of his native village dragged the carriage from the railway station to the church, where a crowd had already gathered to join a thanksgiving service for his safe return. His mother, sisters, and the African boy, Jacko, are with him in the carriage, a brother bears the travel worn colours carried through Africa to be placed in the Church. His faithful dog, "Pickles," is being held back by a labourer. His father, the vicar, stands in front of the porch, near which are the members of the reception committee, in front of whom is a crippled shipmate of the traveller when a middy on board the ship "Victor Emmanuel." The moral tendency of this picture is so good that had the execution been equal it would have been the principal ornament of the year, but for careless drawing and crude work it can scarcely be otherwise described than as a sketch. Mr. J. E. Millais is very happy in his portrait of "The Earl of Shaftesbury," No. 242. "A Jersey lily," No. 307, is a portrait of a lady of considerable beauty, but not more interesting than that of many ladies that excite no comment. "Four Miles from any Town," No. 436, by Mr. T. W. Shaw, is a capital representation of a sandy heath, far from the hum of men. As a record of smaller details of Nature, it is worthy of a place in the National Gallery. The same may be said of "Trespassers," No. 453, by Mr. J. C. Adams, which represents child-

ren gathering flowers in a corn field. "Her Last Sacrament," No. 543, by Mr. A. Stocks, discloses an affecting scene, the death of a grandmother. A family assemble as the clergyman of the parish reads the communion service. A death-like pallor has settled on her cheek as she lies in her bed. Her expression is that of resignation of the cares of earth and of anticipation of immortality. The picture may be said to belong to the Faed school, but is less powerful and highly finished than the best works of Thomas Faed. One of the more conspicuously meritorious of the pictures in the Gallery is "A School Treat," by Mr. Eyre Crow. Children are enjoying, as only children can enjoy, a fine day in the country. The horses that have dragged them to the scene of their sports do not look fatigued, and are painted with great power. "Childhood in Eastern Life," No. 589, by J. B. Burgess, represents an Algerine household. Two men and a boy are sitting on a divan against a wall of rich blue oriental tiles. Three girls are on the floor. This is a pleasing picture without any transcendant merit. No. 590, by Mr. P. R. Morris, shows a group of deer clustering before a Gothic tomb, on which a lovely peacock is sitting. The sentimental might easily conceive that the artist personified by animal and bird-life the corporeal and spiritual life of man. The portrait of a lady, à la Reubens, No. 593, by Mr. J. E. Storey, is a reproduction of a rather pretty lady in the dress of one of Rubens's wives, and a pretty picture she makes, even although the flesh painting, for which Rubens was so celebrated is wanting. "Miss Clara Merrick," No. 595, by the Chevalier L. Desanges, apparently does justice to a most graceful and beautiful young lady, the best specimen of a blonde in this year's show. She sits on a wall attired in a white grenadine dress and blue sash. She wears a black hat and white feather; the colouring is particularly pleasing against a back ground of trees. It is entirely an open air picture, but one in which nature has not been sacrificed to art. "All among the barley," No. 613, is a most natural representation of a corn field, well studded with the bright scarlet poppy. No. 607, "Gone away, a find with the Pytchley hounds," by Mr. John Charlton, shows a group of ladies and gentlemen on horseback who have lost the fox. The hounds are hurrying in a confused group on the left. They are especially well done. No. 635, "Lost," is by Mr. J. E. Hodgson, "One touch of nature makes the whole world kin." The scene is apparently laid in a stable where an old brigand from his dress and features, presumably a Kabyle, is closely examining a miniature of a child. The sentiment endeavoured to be conveyed, is that of grief for a lost child which the miniature resembles. A large assortment of spoil lies on the ground.

POTTERY AND PORCELAIN, ANCIENT AND MODERN.

PART I.

PRE-HISTORIC POTTERY AND THAT OF MODERN SAVAGES COMPARED. EGYPTIAN AND ASSYRIAN POTTERS.

POTTERY is a primeval art, the first advance on the utensils—the gourds, the shells, the birds' eggs, the skulls, which formed the vessels of the first men. The earliest attempts of potting were in *terra-cotta*, or sun-dried clay, of which every Continent affords examples, whose origin it being impossible to trace at present to historic records, it is the fashion to term pre-historic.

The potter's wheel appears to have been invented at a very early age in the history of the art, but it is impossible to trace its invention. It was known to the Athenians, the Corinthians, and potters of Sicyon, but, according to Brongniart, it is of Chinese origin. The early Greek vases were moulded on the wheel, as is apparent from their symmetrical form, as well as from traces of the concentric lines, which are difficult to efface. Egyptian monuments show representations of the potters working with the wheel; but modelling by the hand was used as at present, for the ornamentation of the clay vessels after they were removed from the wheel; the modeller being assisted by moulds, either of *terra-cotta* or metal, and the moulded material was applied in a pasty state to the vase or pot. There is but little proof that the so called pre-historic urns of sun-burnt ware, which from their irregularity of form cannot have been made on the potter's wheel, were older than Assyrian, Greek, and Egyptian pottery which had been made on the wheel; the difference is rather anthropological than chronological.

The earliest Celtic pottery resembles that of the Scandinavians and Teutons, who are supposed to have had small knowledge of the better kinds of ware. The paste of which these vessels are made, which are found in the barrows and mounds of the Celtic tribes, is considered to correspond with the clay of the localities in or near which they are found. It is often very coarse and mixed with small gravel, which may have been purposely combined with it to strengthen the material. The vases found in various European localities are usually urn shaped. They are pointed at the bottom and wide at the top, but the openings are so narrow that they could not have been in general use, and they seem to have been made for purposes of a funeral kind. They are coarse and simple, perhaps a few lines of irregular banding in waves or vandykes encircling them, or the pattern has been pricked out with some sharp-pointed tool. A zig-zag or "herring-bone" pattern is common. There is a variety in some specimens which are covered with more elaborate patterns, but all of a rude form. The size of the sepulchral urns is from 18 to 32 inches high. Some are full-shaped, and measure about 20 inches in diameter, while others are so narrow as to be only about four inches across. They have no mark of having been worked on the wheel, but have evidently been made by hand alone.

The black Gallo-Roman ware owes its colour to carbon, and is considered by Brongniart to be the work of the ancient Gauls; he thinks the early Celtic to be Gallo-Roman. Some of the latter resembles the old German pottery,

and pottery of this kind has been found at Gisors in the old Gaulish barrows. This has the marks of the potters' hands, and seems to have been made on the wheel. But differences between some specimens of Gallo-Roman and Celtic, are too obscure to be easily determined.

The pottery of the so called "Stone age" in the lake dwellings of Switzerland, is found chiefly in shreds, and seldom entire; it is of the most rude kind. Those specimens found of the "Bronze age," have terra cotta rings.

The vases found in England and Wales are still more rude in ornament. Sometimes they are found with one placed inside another, and contain the ashes of children or domestic animals. The urns differ in shape according to locality. Those of the Welsh coast are like those found in Ireland; they seldom have handles, but have sometimes a knob with a hole in it to hold a string, by which they might be suspended. This is found in Etruscan and Peruvian pottery also. In Wiltshire many remains of these have been found, and many near Dorchester, Stonehenge, Devizes, and other places in England. The early Scotch pottery is very like that found in England; there are those which have been made on the wheel, and such as have been done entirely by hand.

The museum of the Society of Antiquarians in Scotland has a good collection of inscribed pottery. They are mostly urns found in graves, of a modified conical form, ornamented with lines, some straight sometimes zigzag. It is the rarest thing to find any positive representation on urns of this description. They range in height from three to fifteen inches.

It is worth while to compare these specimens of early British pottery with those made by savage races in ancient or modern times. In Brazil, in the province of Para, the natives make bowls of a mixture of equal parts of the powdered bark of the Carapi, or pottery tree *Moquilea utilis*, and clay. These are capable of withstanding great heat, the bark being so strongly alkaline that it acts as a sort of flux for binding together the clay, which thus forms smoother ware than is usual amongst the pottery of savages. It is even comparable to the inferior specimens of the Archaic Greek age. The pottery of Mexico is very variable in its character of texture as well as of form. A specimen of a cooking pot standing on four feet, grotesquely modelled after those of the human body is before us; it is ornamented with runes similar to those found on stones, ascribed to the Picts; it stands about five inches high, and is of terra-cotta clay with a semi-glaze of red.

The burial grounds of Peru afford abundant examples of pottery, mostly of very grotesque form. The red is the most abundant and the human body is caricatured in the form of vases and bottles, some of which are painted with red, black, and white colour. Some of these take the form of characters in European languages, the letters S, W, and O being most frequent. Other vases are ornamented with representations of ears of maze. One especially before us is of a black colour, resembling in texture the so-called Etruscan, which is more probably Greek pottery. In the museum of the Bristol Institution and Library, as well as in the British Museum, specimens of this black ware are to be found, resembling in shape grotesque combinations of animal forms, such as are not found in nature. Fish of extraordinary forms, and dragons of monstrous design seem to embody some mysterious theological belief. The analogy between the Peruvian and the Greek pottery is so great, as to suggest a common origin. The

Greeks and Peruvians seem to have been taught by the same masters, but each used the art to embody their own ideas. This analogy might be traced between the pottery of modern savages in widely scattered spots, and that of the master races of antiquity as well as of the so called pre-historic men. We acquired a few pieces of pottery which were brought by Sir Garnet Wolseley's expedition from Ashantee, and these were of a black glazed ware, which reminded us at once of the black Etruscan and black Peruvian pottery. They are engraved in a manner so similar to the pre-historic urns of ancient British make, as to suggest common instructors in their ancestors. The resemblance between the pottery of widely scattered tribes is a strong argument for the unity of man, who in the simple utensils which seem necessary to his being, forms them of the materials out of which he himself is said to have been made—out of mother earth.

The early histories of Oriental pottery in the eastern languages contain much that is obviously fabulous; but by comparing those specimens which have been found on the sites of ancient cities, with such descriptions as are contained in these early records, an approximate estimate of the reality of what is thus described can be attained. Herodotus states that Ecbatana was surrounded by seven walls of different colours, the outermost being white and enclosing a space about equal to the size of Athens. The other walls were of black, purple, blue, and orange, and the two innermost walls of other colours, and their battlements plated, the one with gold, the other with silver. These walls may have been covered with enamel of the above named colours, a practice adopted in India and China. Sir Henry Rawlinson mentions a building in Chaldea called Birs Nimrúd, believed to have been restored by Nebuchadnezzar. The supposed proof of this is, that cylinders with inscriptions which have been deciphered were found with the date about B.C. 605. These cylinders were found in the corners of the stories of this building of which there were seven. The stories gradually decreased in size so as to form a terrace round each. These stories were dedicated to Saturn, Jupiter, Mars, the Sun, Venus, and Mercury, in different colours. On the top was a vitrified heap. The colours were enamelled on the different stages or stories of the building.

Similar remains of bricks covered with glazed material in which metal oxides of many hues were employed, have been discovered on the site of ancient Babylon. The use of oxide of tin as an enamel, though frequently ascribed to the invention of Luca della Robbia in the fifteenth century, is proved to have been known at this remote period. Various devices such as figures of plants, animals, and flowers, are depicted on what seems to have been the innermost walls of buildings of different kinds.

Mr. Kennett Loftus, describes in his "Travels in Chaldea," an ancient ruined city named Warka. Here he found remains of lamps, cups, and figures. But the most remarkable discovery he made, was of an immense number of coffins covered with glaze, and the apparent burial place of many generations. He considered that the city must have been abandoned for probably 2000 years. But it appeared to have been chiefly, if not entirely, used as a burial place. Some of these coffins are now in the British Museum, and are of peculiar shape, like a covered slipper bath with an opening for the escape of the condensed gas, which would without some vent have caused the bursting of the coffin. The coffins shew an embossed figure, the physiognomy of which resembles the heads on ancient coins found of the Parthian and Sassanian dates.

The early Egyptian potters were famous. Earthen vessels were made for domestic use, and for receptacles for mummies of animals. The idols and various articles were frequently made of silicious earth and covered with glaze generally blue or green. They were sometimes made of steatite, which could be immersed in the melted enamel without injury. The lotus or sacred lily of the Nile, was a common and favourite ornament. The composition of which these figures or flowers is made, is sometimes called Egyptian porcelain, and some specimens are considered very ancient. From Scripture as well as other sources, it seems evident that Egyptian art was flourishing at least 2000 years before the Christian Period. In the time of the Ptolemies, Greek artists greatly influenced Egyptian manufactures. The hard silicious grit is superseded by a softer and coarse grained material, not always coated with enamel, but frequently merely painted. In the British Museum are found specimens of light coloured clay, with figures in black; and a red terra cotta vessel shaped like a woman with a guitar, is thought to be of the XIX dynasty, it was brought from Thebes.

Ceramic Art of Great Britain.

By Mr. Llewellynn Jewitt.

The only general history of the Potter's Art in Britain is that by Mr. Llewellynn Jewitt, F.S.A., entitled "The Ceramic Art of Great Britain, from pre-historic times down to the present day; being a history of the ancient and modern pottery and porcelain works of the kingdom, and their productions of every class." This is illustrated with nearly 2000 wood engravings, in two volumes royal octavo, and published by Messrs. Virtue and Co., at £2 12s. 6d. The full value is given for the money, the woodcuts being a very complete series, well engraved and printed, so as to render the book, from the careful research with which it is compiled and the numerous monograms which are given, indispensable to the British collector, both of pottery and porcelain. There is a deep study about it which is not found in any other writer that we know, except Brogniart. Commencing with the pre-historic or Celtic urns, it figures about 77 of the most remarkable forms, giving an analysis of the manner in which they were probably made. The various kinds of Roman pottery are well figured and the potters' kilns which recent research has discovered at Castor. The Salopian ware of Roman age, and the various factories of that period in England are noticed. The Saxon period is treated at some length and well illustrated, as is the Norman. The later mediæval ware is much less definitely known. At that time began an extensive trade with the Low Countries, and the Grés de Flandres ware was much imported. It is not so clear when it was first manufactured in this country. In the Elizabethan age there was an English manufacture of stone ware, which has never become extinct but has gradually grown into the very superior art now manufactured by Messrs. Doulton, of Lambeth. The Fulham ware which began to be made in the reign of Charles II. may be considered the parent of the art now practised at Lambeth. But Lambeth itself has been for the last two centuries the scene of various factories of Delft and stoneware. A red ware was coated with a white glaze, of this an example exists in the South Kensington Museum, and we possess another which is said to have belonged to the Protector Cromwell. The various porcelain factories of Chelsea, Worcester, Bristol, the pipe makers of Brosely, and all the modern manufactures are treated with care-

ful detail, so that the work might be called by many, an exhaustive one on the subject. From the extensive quotation of original manufacturer's records of their expenses and business details, the work will have great value to the student. It requires enlargement in some of its details, and no doubt this will be done when the omissions are perceived, and the author gets the aid of more local experts in revising his truly national and most popular readable work.

(*To be continued.*)

ON THE CAUSE AND CURE OF THE EVILS ARISING FROM THE LOW PRICE OF SILVER.

THE discovery of gold in California and Australia while it was a great means of developing the resources of these countries, yet by increasing the abundance of gold was adverse to the interest of those with fixed incomes, although favourable to those who had articles to sell, as owing to the increased abundance of the standard of currency in Great Britain, the great focus of wealth in precious metals in the world, sellers were enabled to get higher prices than heretofore. As the supply of silver did not keep pace for some time with that of gold, an alteration took place in their relative value, so that the price of silver rose to a great point—higher than had been known for many years. This was increased by the balance of trade with India and China being paid in silver rather than in gold, it being the most popular metal in these countries. This course prevailed for about ten years, when by the discovery of extensive deposits of silver in Nevada that metal began to fall in price, and this fall was still further accelerated by the adoption of a gold standard by the Imperial German Government, which necessitated the withdrawal of a large portion of silver money which had previously been the chief currency. In consequence of the influx of silver in the market, the value was greatly depreciated. Holders of silver, plate, and coin, found they could not get the valuewhich had ruled for many years previously. The largest holder of silver coin in the British Empire is undoubtedly the Indian Government, and consequently the one which most deeply suffers from any depreciation in the fall of the value of silver. As the Indian revenue is received in silver, and as the Indian Government is obliged to send much money to England for various purposes, it must itself bear the loss consequent on a depreciated market, that is, the difference between the nominal value of the rupees, and that between the market price of silver in London. Last year this constituted a loss to the Indian Government of about two millions sterling, and as silver is still falling in price, this may be greatly increased this year. This loss affects every holder of rupees: officers of the army and their men, civilians and merchants, all suffer when they change their rupees into sterling. The evil, however, is easily remediable, but now is the time to attack it. It demands an imperial mind to apply the remedy; local remedies are likely to be ineffectual. The British shilling and florin should take the place of the rupee. Let the Indian Government as it re-

ceives the rupees in payment of revenue, recoin them on the spot as English florins and shillings, and let this new money be sent to England, and be receivable as the legal tender at the Bank of England, or in other Government receiving establishments as for payment of British taxes. The loss, then, would be more equally distributed in the Empire; it would not so heavily affect one branch of it. Gradually the English shilling, being more valuable, weight for weight, than the rupee, would replace it in India, to the infinite benefit of all who have to make payments in both countries. Were a larger portion of silver in circulation in England than at present, no mischief could possibly accrue, and the Indian or British Government might even make a large profit by purchasing rupees in this country at the market price and recoining them as shillings. They would steadily rise in price under this process, so that in time the silver difficulty, so far as it has at present gone, might melt away. But should Nevada and other silver producing countries make the market even lower than it at present is, then we have another resource in the removal, or lowering to a nominal scale, the duty of 1s. 6d. per ounce on silver plate, which might be expected to give a great impetus to the manufacture of silver plate, by causing it to be more purchased by the middle and lower classes than at present. The use of silver plate, and the desire to possess it, must in these days of the redundancy of silver, be reckoned a virtue; and of all articles of a valuable nature, silver spoons it must be admitted, are those which suffer least on sale. Thus, if the good housewife has 50 ounces of forks and spoons which she can buy new at 7s. 6d., or secondhand at 6s. 6d. an ounce, she can obtain for them even at the present low price of silver, 5s. per ounce on sale. Thus silver plate is the safest and best investment which does not produce interest that can be found, and as silver will certainly rise in proportion as it is bought for domestic use, so the house wives of England need not fear, if they make extensive investments, any great depreciation. Should any reluctance be shown by the British Parliament to sacrifice the revenue derivable from the 1s. 6d. per ounce duty on silver plate, the Indian Government might, in its own interest, make up this deficiency in return for the privilege of circulating shillings coined in Bengal. It is a question worthy the attention of the British and Indian Governments, whether they should not issue, Government stamped, such articles of plate as are in general use in both countries, at the price of the cost of manufacture and the value of the metal, receiving them always back at the current market price of the metal. Were such a plan pursued, even were the price of silver to fall one third, no inconvenience either to the majority of the public or to the governments could ensue.

VIVISECTION IN BAYSWATER.

Letters from Mr. George Busk, F.R.S., Mr. R. A. Cross, the Home Secretary, and Lord Shaftesbury.

At a meeting of the International Association for the total Suppression of Vivisection, held at the Langham Hall, on May 21. The Rev. Canon Baynes in the chair. Mr. C. O. Groom Napier, for the Burlington Debating Association, gave an account of the vivisection of a dog at Bayswater.

In consequence of the publication of the first number of "Burlington House," the following correspondence has taken place :—

"Secretary of State for the Home Department,
"32, Harley Street,
"March 25, 1878.

"Sir,—The attention of the Secretary of State having been called to a case of supposed vivisection related under your signature, in what appears to be a forthcoming number of a periodical termed the Burlington House Magazine (p. 35), I, as Inspector under the Act, have been directed to make some enquiry concerning the occurrence, which you describe as having been witnessed by yourself last spring in Bayswater. Not knowing where else to apply, in the first instance, for information, I venture to request you to be good enough to furnish me with such further particulars of the case as it may be in your power to supply.

"1. I should be obliged if you would let me know the date of the occurrence, and the name of the street in which the crowd you mention was collected round a dead dog, so that, if deemed necessary, enquiry may be made of the police of the district, under whose notice such an extraordinary public occurrence must, I imagine, have come.

"2. I should be glad to be favoured with any reasons you may have had for accepting the statement made to you merely by a casual bystander in the crowd, or by more than one, as in any degree rational or probable, and not as a mere idle invention or rumour.

"The statement itself, as you must allow, is at first sight so extravagantly absurd, that before publishing it, you have without doubt taken sufficient means to satisfy yourself, that there really is, or was reason for believing, that in the midst of a crowded neighbourhood a gang of vivisectors was known to exist, who practised their experiments in known premises. And, moreover, that on the occasion in question, these persons had chosen for their purpose the strange hour of between 10 and 11 at night, when they must have used artifical light in a glass house, open, as it would seem, or close to a street, or at any rate exposed to the gaze of the immediate neighbourhood. I may be allowed also to ask whether you can explain how it was, that your informants were so astonishingly well acquainted with the object and other particulars of the experiment, which, as I should think, could only have been known to the actual perpetrators, or to persons present on the occasion. Is it not very strange also, that when the proceedings of these persons were so notorious as to be familiarly known in a promiscuous crowd, no one should have taken the slight trouble of communicating with the police or with Mr. Colam ?

"And I may be allowed to observe that had this simple course been taken by yourself at the time, there can be no doubt the malefactors

would at once have been brought to condign punishment, either under the Vivisection Act, if they were proved to be acting in the outraged name of science, or under the Cruelty to Animals Act, if they were actuated by what are considered the more venial promptings of ordinary vulgar cruelty or sport. I may ask you also, perhaps, to be kind enough to say whether from anything that came under your own actual observation, the dog may not, after all, have been merely the victim of a street accident, &c.

"Believe me, your obed. servant,
"Signed, GEO. BUSK.
"To C. O. Groom Napier, Esq."

To this I replied as follows:—

"To George Busk, Esq.,
April 1, 1878.

"SIR,—As your letter addressed to me contains insinuations of a most uncalled-for character, I can only reply by referring you to the May number of "BURLINGTON HOUSE."

"Your obt. servant,
"(Signed) C. O. GROOM NAPIER."

A Superintendent of the Detective Police, by Mr. Secretary Cross's desire, called on me, and I gave him such further information as I could to facilitate the inquiry.

"Secretary of State for the Home Department,
"32, Harley Street,
"April 2, 1878.

"SIR,—I am sorry you have not thought proper to afford the information I requested, and without which I apprehend it will be more difficult than it might otherwise have been to trace the offenders. And I still more regret that you should have so misunderstood my expressions in my letter, as to suppose that they were intended to convey any unworthy insinuation as regards yourself. Most certainly such was not my intention. I must, however, at the same time, confess that as at present informed I do not place any credence in the story which was told to you, but which may, of course, admit of explanation which I was in hopes you might be able to afford.

"I am your obt. servant,
"(Signed) GEO. BUSK.
"To C. O. Groom Napier, Esq."

It is not to be expected that an old surgeon should be a very efficient Inspector of Vivisectionists, since if he at all represents the majority of the medical profession, he could not be expected to be an independent agent in the matter. In other departments of law, and in other cases where Government inspection is required, care is taken to select inspectors whose interests are neutral. If that is not done inspection is useless, and can only lead, as in the present case, to false conclusions, without any reflection being made on the honour of those employed.

In the Romance of Natural History frequent instances are related of the discovery of mares' nests, and one has surely been found by the clumsy machinery of the Home Office. The following letter is a proof of this discovery:—

"Secretary of State, Home Department.

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"Whitehall, April 15, 1878.

"MY LORD,—With reference to the alleged case of vivisection of a dog mentioned in the number of "BURLINGTON HOUSE" Magazine, which was sent to this Department by your Lordship on the 22nd ultimo, I have the honour to inform your Lordship that inquiry has been made by the police, who report that the dog in question 'was a large one, homeless, but a great favourite with the coal porters and others in the neighbourhood of the Great Western Railway Goods Depôt, who

used to feed it. *It is said* to have been accidentally run over in Gloucester Crescent, Bayswater; died immediately after, and was skinned when dead. The skin was stuffed, and *became the property* of a man named WALKER, who formerly lived in Westmoreland Mews—his present address, however, is not *known*.

"I have the honour to be, my Lord, your Lordship's obedient servant,

(Signed) "RICH. ASSHETON CROSS.

"The Earl of Shaftesbury, K.G."

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The first letter of Mr. Busk, in which he refers to the death of a dog by a street accident, appears to have been founded on this story. But the dog described in "BURLINGTON HOUSE" was found dying from the effects of a blow humanely given to put it out of its torture, in Burlington Road, Bayswater, half a mile from Gloucester Crescent. It was not skinned, except on a portion of the back, which had been operated on by one skilled in the use of surgical tools. This was remarked by at least four of the bystanders who examined it, some of whom saw the dog run from the vicinity of Pembridge Square, up Ledbury Road, until Burlington Road was reached, when the dog, almost mad with agony, was rendered senseless, and almost immediately killed by blows on the head with a poker.

Had the policeman, who took charge of the dog, done his duty, and the bystanders, who lived near where the dog was vivisected, given evidence, the case would not have ended in this unsatisfactory way. Hearsay evidence is not admitted in our courts of law, and, therefore, if those in possession of the facts—the principal of which was the body of the dog — declined to report the matter, the truth could not be made apparent.

Our detective system is often abortive in dealing with offenders who are amply supplied with money, which may be used in the concealment of their offences.

Lord Shaftesbury and Miss Frances Power Cobbe urged the matter being made public. His Lordship wrote as follows :—

"March 22, 1878.

"DEAR MISS COBBE,—It would be well to get up a petition from Bayswater reciting the fact. I will present it, with observations, to the House of Lords. The writer of the article should sign it. WE ARE LIVING IN THE MIDST OF DEVILS.

"Yours truly,

(Signed) "SHAFTESBURY."

"P.S.—The petition should pray the House to take steps to suppress such detestable practices."

REVIEWS OF BOOKS.

White of Selborne, the Naturalist.

We have known ten men, now famous, who have derived material stimulus and many practical hints in their pursuit of field natural history, by the study of White's famous book; therefore it is not at all surprising that frequent editions with additions should be issued. The most attractive is undoubtedly that published by Messrs. Macmillan and Co., with notes by Mr. Frank Buckland, aided by Colonel Hardy, Mr. Menzies, Mr. A. D. Bartlett of the Zoological Gardens, and Mr. Groom Napier—as regards the practical natural history—with a chapter on antiquities by Lord Selborne. It is illustrated by Mr. P. H. de la Motte with very beautiful wood engravings, and at the reduced price of a guinea, at which it is now sold, it, in its handsomely gilt cloth binding, will be a sound investment for lovers of Nature both in country and in town. In the country it will be a useful index to the *animal* life of the South of England, excepting principally the insect and other invertebrata, which White did not so much notice, and which Mr. Buckland has not in his voluminous notes supplied. A new edition with the entomology and botany of Selborne would increase the value and local unity of of the work. But there is quite enough in Buckland's to occupy the attention of the ordinary reader, for a large number of subjects mentioned by White, are more fully explained by cuttings inserted from "Land and Water," a publication which has contributed much to the advance of practical natural history. Materials for a memoir of Gilbert White are very scanty, and no portrait of him exists; therefore, if we would imagine the sort of man he was, we must collect the materials for constructing our ideal from his book. Specimens of his handwriting exist, and from these a very good photographic *fac simile* is given in the Buckland edition. Having given especial attention to the study of handwriting during more than twenty years, and having especially compared this handwriting with that of other naturalists, some of whom, strange to say write very like White, although perhaps brought up without even having seen a specimen of his handwriting. The resemblance is so close that the expert can easily, from the association of the characteristics of mind, habits, and appearance of living naturalists, with a special type of handwriting and a comparison of the *fac simile* given in the book, bring before his mind the living Gilbert White. This is a strictly scientific and inductive application of paleography, analogous to the resurrections of paleontology. The handwriting of White therefore, indicates an extremely reverent, conscientious, painstaking mind, ever awake to the phenomena of nature, and ready to record it with the utmost accuracy, with a well-balanced judgment that leaves scarcely anything to be desired, with a clearness which prevents mistake, and with a notice of all the attendant circumstances. Most naturalists are such specialists as to ignore the facts which are out of their own line of labours; the extremely orderly arrangement of the letter, and the measured distance between each word, in a man so advanced in life as White was at the time he wrote it, is a sure indication of time and place well measured, and a life devoted to systematic science. White was a man of genius, he was no imitator. Settled in a remote country village, nature was his teacher. He had the education

of a scholar at the University, but received no instruction there in natural history, therefore, his mind being powerful, and receiving the best instruction, that from nature, grew into one of the most remarkable of the last century, although from the subject of its observations, it was calculated only to interest kindred spirits. Gilbert White apparently suffered from the want of a good library of scientific books, although there were few, comparatively speaking, in his days. Mr. Frank Buckland gives a list of books which he supposes Gilbert White must have had in his library. We possess the following books on a good pedigree which belonged to him: Speed's, Baker's, and Martin's Chronicles; Camden's Britannia, Spelman's Glossary, Sammes's Britannia, Tillotson's Sermons, and Meriaen's Insects of Surinam, and his Natural History Cabinet.

Professor Thomas Bell has lived more than thirty years in White of Selborne's house, and has collected a large mass of literary matter in the two volumes of his edition published by Mr. Van Voorst. He has collected many memorials of the White family unknown to previous writers, and his memoir of Gilbert White is the only one hitherto published at all worthy of the name. There is a transcript of Latin documents relating to Selborne Priory, and a more clear setting forth of White's actual notes, printed from his manuscript, with Marwick's notes, than has been previously given—also the summary of the weather. This matter is often incorporated in the letters, but still the lovers of White will value it in its original form. The letters to his brother, the Rev. John White, are very interesting, and give notes on specimens collected in Gibraltar by John. These would alone give a unique value to Professor Bell's edition. These letters contain many interesting family references. For instance, to Mrs. Chapone, his old sweetheart, and to Mr. Benjamin White, his brother, the bookseller of Fleet Street. The correspondence of the Rev. John White with Linnæus and Linnæus's replies are important contributions to scientific history. There is a large collection of letters between Gilbert White and other members of his family, and Colonel Montague, &c. These occupy over 200 pages, and would alone give to the edition a great value. There is a short article on the sense of hearing in fishes, and a capital sermon, unfolding his great talent and Biblical knowledge; a copy of his account book, the original notes for his garden calendar, and contributions collected by Professor Bell to a fauna and flora of Selborne. This embraces mammalia, birds, reptiles, fishes, mollusca, lepidoptera, flowering plants and ferns (the list of all but the vertebrata is scanty and incomplete), with a chapter on the geology of Selborne by Mr. William Curtis, and a chapter upon the antiquities of Selborne by Lord Selborne in conclusion. As an illustration of White, Bell's edition is more valuable than Bucklands, but the latter is the most readable and popular book, calculated to promote the manufacture, if such be possible, of new naturalists. Professor Bell's book contains a few steel plate views of White's house and the scenery of the country.

Health and Life.

By Dr. Benjamin Richardson, F.R.S.*

This is a series of suggestive essays, republished from "Good Words," by the great medical apostle of total abstinence from alcohol. In his chapter on health and thrift, he adduces facts which tend to show that from the year 1700 the death-

* Dalby, Isbister, and Co. Price 3s. 6d.

rate of London has been decreasing, a statement which is generally admitted, notwithstanding that the experience of countless individuals tends to show that this superior longevity is the accompaniment of considerable physical decline. The fathers and grandfathers of most of us are more powerful than we are, which leads to the inquiry whether the present sanitary conditions, are not such as tend to the production of a numerous crop of weaklings, who in rougher times did not survive to perpetuate their kind. This leads us to the question of classes in our society pre-eminent for their healthiness and longevity, such as the Jews, the subject of the third chapter in the book, whose ceremonial laws, by causing the rejection of much unwholesome meat and the more complete bleeding of the animals used for food, gives less cause for the cultivation of inflammatory tendencies. The substitution of vegetable oil for animal fat in cooking, is a considerable improvement also over Gentile habits, for the large quantity of stearine contained in dripping and butter, renders food containing them much more difficult of assimilation than that made with olive oil. The Jews have conquered the Christians among whom they have dwelt by their superior vitality.

A short chapter on national health calls attention to this true secret of England's greatness, and leads on to what the author conceives to be a definition of the art of healing, which is treated too scantily to satisfy curiosity. In reference to the art of prevention, the author's most prominent instance is the vaccine prevention of smallpox. He does not support his case by facts. There is a chapter on the matter of air as food. The writer explains its combustion or decomposition by the living animal; and it may be legitimately laid down, that the organism satisfies its appetite by respiration as much as by mastication and common digestion. He has two chapters on ozone, a substance often talked of by the most superficial scientists. Dr. Richardson refers to the notion that pulmonary complaints and colds are much more prevalent in the ozone period, which, if true, is probably caused by the condition of oxygen, which constitutes ozone being less fit for supporting respiration than the unsophisticated oxygen. Numerous other branches of the tree of life are analyzed by the Doctor with his characteristic suggestiveness. But it is as a stepping-stone to his higher and more philosophical essays that the work is chiefly valuable.

ANCIENT KNOWLEDGE OF PRECIOUS STONES.

(Continued from page 72.)

PROFESSOR TENNANT, no mean authority on these matters, believes gold indicates the presence of diamonds, and *vice versâ*. In the British Museum a specimen of native gold is shown, enclosing a crystal of diamond. The diamonds of Brazil have been undervalued by interested persons, but most of the finest and largest diamonds obtained of recent years have been found there. A few diamonds have been found in Australia, Sumatra, Java, the Ural mountains, and still more recently in some abundance, at the Cape of Good Hope.

Professor Tennant, in a paper read November 24, 1870, before the Society of Arts, thus describes the discovery of diamonds at the Cape :

"In March, 1867, Dr. Atherstone, of Graham's Town, received by post in an unsealed, unregistered letter, a rough diamond which had been picked up on a farm in the Hope Town district, and forwarded by Mr. J. O'Reilly to Mr. Lorenzo Boyes, Clerk of the Peace for the district of Colesberg, who sent it to Dr. Atherstone in order that he might give his opinion as to the probability of its being of any value. He had not seen a rough diamond before, but, after taking the specific gravity, testing the hardness, and examining it by polarised light, he decided that it was a genuine diamond of considerable value ; and, perceiving the great importance of such a discovery to the colony, he at once wrote to the Colonial Secretary, suggesting that it should be sent to the Paris Exhibition, and afterwards sold for the benefit of the finder. This fortunate person was a Dutch farmer, named Schalk van Niekork, who, seeing the children of a neighbouring boer playing with some bright stones, was struck by the appearance of one, which he offered to buy of the mother. She laughed at the idea of selling the gem, and gave it to him at once. He showed it to Mr. O'Reilly,who was returning from a distant hunting expedition, and so it finally reached Dr. Atherstone. At the close of the Paris Exhibition the stone was purchased by Sir Philip Wodehouse, then governor of the colony, for £500.

"Hitherto it had been unusual to receive more than one large diamond—say of forty carats—in the course of a single year, but the new fields had yielded no less than five stones exceeding this weight within that time. One of fifty-six carats, and another weighing eighty-three carats,which arrived last year, and proved to be an exceedingly beautiful stone. It was now in the possession of Messrs. Hunt and Roskell."

One means of distinguishing diamonds "was by chipping off a piece, and observing the form of the fragment, but it was not absolutely necessary to apply the test of cleavage, for, as it was very rare indeed to find a diamond perfect and without a flaw, by examining the surfaces of a flaw the character of the stone might be determined. The diamond, although the hardest of substances, was one of the most brittle, and it was probably owing to ignorance of this fact and carelessness on the part of the diamond seekers, that so many of the diamonds brought from the Cape were broken. The principal diamond-bearing districts at present discovered were the valleys of the Vaal, Orange, and Reit Rivers. A great variety of other minerals had been found in the same neighbourhood. The

pebbles consisted of rock crystal of different colours, and, together with agate, jaspers, (black, red, and ribbonned), quartzite, garnet, spinel, peridot blue corundum, were abundant, while iron-ore, sandstone, basalt, and granite were also found in these regions."

According to Professor Tennant, "only about 10 per cent. of those found were of the fisrt water. Many of those received from South Africa were very defective. In the large one of which he had spoken, weighing eighty-three carats, there were three flaws; nevertheless, £5,000 was offered to the finder while it was still in the 'rough.'"

In the *Friend of the Free State*, a Cape newspaper, mention is made of the discovery in Vaal River district of a diamond of 88 carats, for which the finder refused £22,000 on the spot. This discovery is thus described:

"Mr. Wheeler, of Beaufort, West, and six of his relatives, have been at work on the Pniel banks for four months. They had, to Thursday morning, picked up twenty-one diamonds, but did not consider that this would be sufficient to realize their expenses, and they had just resolved to pack up and be off, when Wheeler, who had been standing by his cradle and overlooking the working of it, held up his hand and shrieked as if he had been shot. 'What's up?' asked his assistant. Wheeler, when he had recovered his breath, explained that immediately the first bucket of water thrown into the cradle oozed away, he saw the light come up from a stone half buried in gravel, and seizing it, he found it to be a diamond about the size of a pigeon's egg. How he felt he could not describe; how he acted they had seen. However, there it was; he held it out to their astounded sight. There are times when men cannot believe their own eyes, and this was one of them. At last they realized the fact, and then they cheered like mad. All the Pniel diggers heard the cheer, and ran like mad; the Klipdrift diggers and dealers heard it, and, seeing the diggers swarming like bees at one spot, rushed down to the boats and crossed over—*i.e.*, as many men as the boats could take over. Hundreds and hundreds of persons saw the gem, handled it, and turned it over—so many indeed, that the proprietors began to fear that their wonderful diamond would be eaten up, and they declined to exhibit to any more people. Wheeler and one of his companions set out with their prize the same evening, and have determined not to sell it in Africa.—*Times Dec.* 24, 1870.

This recent discovery at the Cape seems likely to affect the price of diamonds, which have temporally (?) fallen in price in consequence. In a recent number of the *Standard* we read, "A large diamond was found about a year since in the northern part of North Carolina, on the Virginia border, near the Blue Ridge. In the rough it weighed nearly twenty-four carats, and cut nearly twelve carats. Its value is from ten thousand to thirteen thousand dollars, and but for two almost inappreciable spots it would be worth more. In size it approaches a large plum-stone in length, but it is deeper and broader, almost a square on the face, with rounded corners. Each of the numerous facets had to be ground down separately, it being unsafe to chip off corners for fear of cracking the stone. The cost of the diamond-dust used for this purpose was above one hundred dollars, and the charge for the entire work one thousand five hundred dollars.

The sapphire of the Authorised Version. Hebrew (סַפִּיר) *Sappîr* is most probably the sapphire of the modern jewellers. When Moses and the elders saw the God of Israel, "there was under His feet as it were a paved work of a sapphire

stone, and as it were the body of heaven in His clearness" (Exodus xxiv. 10). And again in Ezekiel i. 26, it is said: "And above the firmament that was over their heads was the likeness of a throne, as the appearance of a sapphire stone." This stone, if the Oriental sapphire be meant, is one of the most precious, as well as one of the finest of gems, and was most highly prized in ancient times. But wisdom was more precious than the sapphire and other precious things, as recounted in Job xxviii. 16.

The *sapphirus* of the Greeks and Romans was described by Pliny, as sparkling with scales of gold, and of an azure colour; just the appearance of the lapis lazuli. It is probable that the sapphire of the second foundation of the wall of the heavenly Jerusalem, was the clear sapphire of modern times, but it might possibly have been the lapis lazuli, principally on account of the identification of the Greek term with that used by Pliny. These stones might have been confused by the ancient authors on account of the blue colour they possess in common. And thus the sapphire of Revelation may be the sapphire of modern times, from its being so clear and beautiful a stone, and from its being evidently referred to in the Old Testament as resembling the "pavement" or firmament of heaven. This, however, the lapis lazuli also resembles, having a blue colour answering to the firmament, and spots of gold to answer to the stars. These spots of gold are the pyrite which so often accompanies this mineral.

A sapphire or ruby of one carat, is of equal value when of the first water, to a diamond, but the ordinary price of smaller stones is about £3 per carat. The largest known sapphire according to the author of "Underground Life," (p. 498) is called the "Ruspoli. It is in the Musé de Mineralogie of Paris; it is of a lozenge shape, with six faces, and weighs 132 carats. It was bought by Perret, a French jeweller, for £6,800." There was exhibited in the International Exhibition of 1862, a sapphire of a much larger size than this. It was a matchless stone, being free from cloud, and of the deep colour which is supposed to be characteristic of the sapphire, with a sparkling brilliancy which we do not remember to have seen surpassed in any precious stone.

The lapis lazuli is a compound of sulphur and sodium, with a trace of iron and other minerals, and was probably obtained anciently in Persia, where it is now found in great abundance. The sapphire is a much purer body, consisting of alumina, with a trace of cobalt. The principal localities at present for sapphires are Matura, Ceylon, Capelan, and the mountains in Pegu.

The emerald (Ex. xxviii. 18), is translated carbuncle in the Septuagint, Kalisch adopts this rendering, and transfers the sense of the name emerald to the diamond. The etymology of (נֹפֶךְ) *Nōkíphéch*, in this passage is doubtful. It is therefore very uncertain what we are to understand by the word translated emerald; the emerald-beryl was most likely the stone referred to in Scripture. It is sufficiently abundant to be in general use as an ornament. Not so the emerald, ruby, or green variety, or corundum, transparent specimens of which are at all times extremely rare, and when of large size are of immense value. It is too uncommon a stone to be used in decoration. The emerald-beryl is a silicate of glucina and alumina, coloured green by oxide of copper, and is a magnificent stone when well crystallized and symmetrically cut. It is of great value when of large size, for specimens have been rated at £10,000.

Emanuel says, (p. 40), "The most esteemed carbuncles are the Indian and Garamantine; the latter

term has given rise to the modern name of garnet. The same gem was also called the chalcedonian. The Ethiopian carbuncles rank very high, and are nearly connected with the almandine and the essonite. Carbuncles of superior brilliancy are termed males, those of a duller description are called females; a distinction which among ancient lapidaries, prevailed in reference to the majority of precious stones. One author observes, that "the carbuncle at first appears as if smoke were rising from it, and after as if burning with a bright flame; and that the chalcedonian inclines to blackness but when held against fire or the light of the sun, its surpasses in lustre all other carbuncles. When placed in a dark room, it presents a rose-colour, but when exposed to the open day-light, it glows like a burning coal. When held against the sun it has the lustre of a flame."

The emerald-corundum, indeed, according to Mr. Emanuel, is so rare at present, that he has only once in his experience met with it. There are specimens in the British Museum. It differs very much from the emerald-beryl in hardness as in chemical composition; the latter is extremely brittle, the fresh stones especially so. Beryls and aquamarines are of less value, but the true "emerald-variety," when well crystallized, and of large size, exceeds the sapphire and diamond in value, being next to the ruby amongst known substances. This, however, only applies to a perfect stone of deep grass-green color and free from cloud and flaws. One of the largest known is that possessed by the Maharajah Duleep Singh; it is three inches long, two inches wide, and half an inch thick. Emeralds were much cheaper in former years than they are at present, which is to be attributed to the exhaustion of the sources of supply, for it is rare now to find a large stone of high quality. The price of emeralds does not increase like that of diamonds on the square of the weight. Beryls in a more or less perfect state are found of a gigantic size. Mr. Emanuel says, "An enormous beryl has been found in America, weighing five tons, but this has not been removed from the spot where it was discovered. A large crystal of beryl from America was shown in 1851, it weighed 78 lbs., but was unfit for jewellery purposes" (p. 138).

"A specimen of the green sapphire of large size belonging to the (original) Hope Collection, once seen by Mr. King, exactly coincided with Pliny's description, its character being the darkest green, aptly designated by the term "*austeritas*," but far from pleasing; and its freedom from flaws, as contrasted with a true emerald of the same magnitude, was particularly striking."—*Precious Stones*, by King, p. 283.

From £20 to £40 per carat is the price of the finest and most perfectly cut stones. An interesting European locality for the emerald is at Henbachthal in Salzburg, a spot 8,700 feet above the sea, on the side of a precipice accessible only by ropes.

In describing the wealth of Tyrus in Ezekiel xxvii., we are told that emeralds and purple were brought by way of Syria from the East; probably from India, a locality where carbuncles are now obtained in great quantity, and may have been so at that early period, indirectly perhaps. This stone was extensively used for decoration (Ezekiel xxviii. 13). The Rajahs in some parts of India, wear girdles almost entirely of emeralds and other precious stones, which would illustrate this passage, as also does Judith x. 21., its use to the engraver. "As a signet of an emerald set in a work of gold so is the melody of music with pleasant wine." Many ancient emerald gems and a few seals and earrings are extant, with devices engraved on them of a date at least as old as Alexander the Great. "The rain-

bow round about the throne was in sight like unto an emerald" (Rev. iv. 3, and xxi. 19). It is uncertain whether this is the true emerald.

Mr. Lewy thinks the colouring matter of the emerald to be a carburet of hydrogen, like chlorophylle, to which green leaves owe their colour; and that the emerald is deposited from an aqueous solution. Mr. Bristow, in "Underground Life," says, "The beautiful green colour of the emerald-beryl has been attributed to oxide of chromium, but the more recent researches of Lewy have raised the belief that the colour may be due to organic matter, the existence of which he has proved by experiment. The largest known emerald is that in possession of the Duke of Devonshire. It is a six-sided prism, two inches in length, 2¼in., 2⅛in., and 1⅞in. across and weighs 8oz. 18dwts. It is also of the finest colour and free from flaws. This emerald was found in New Granada, at Muzo, near Santa Fé de Bogotá" (p. 499).

The Sardonyx, the fifth stone that garnishes the wall of the heavenly city, is clearly identified. Pliny mentions it. The name sardonyx, signifies sard, *red*, and onyx, *flesh* or *nail*. The colour of the stone when cut and polished, somewhat resembles that of the nail with the flesh below it. It is a variety of quartz in alternate layers of red and white, sometimes of a considerable number, their regularity resembling a work of art. The sardonyx is perfectly opaque, unless cut very thin indeed, when it admits light feebly.

The onyx and sardonyx differ principally in colour, which is caused by the different oxides of iron they contain. The sardonyx, the sard, and the onyx are much sought after for cutting into cameos and intaglios; beautiful effects are produced by cutting away the thin layer of black, red, or white, in the case of the onyx and sardonyx, and leaving an image in either of these colours on a strongly-contrasted ground. These stones are not so brittle as some varieties of agates, and are much less easily chipped or broken than the ordinary transparent stones used for the purpose of seal engraving.

The sardonyx is a type of flesh and blood united in one.

The (שֹׁהַם) *shôham* or onyx of the authorized version is first mentioned in Genesis ii. 12, as found in the land of Havilah. Stones of the *shôham*, were placed upon the shoulders of the High Priest, and were worn as memorials, having on them the names of the tribes of the children of Israel, in the order of their birth, six on each stone. The *shôham* also had a place in the High Priest's breastplate, and was prepared by David for the Temple (1 Chron. xxix. 2). The Rabbins thought the *shôham* to be the emerald.

The *shôham* was very precious, being classed in Job xxviii. 16, with the sapphire. Josephus says that the stones on the shoulder were sardonyxes, and that the onyx stone above described, was the second stone in the fourth row of the breastplate.

Braun also thinks that the sardonyx is the stone in question having traced *shôham* to the Arabic *sachma*, signifying blackness, which would however be rather in favour of the common onyx, consisting of black and white layers. Gesenius and Fürst trace *shôham* to the Arabic *saham* to be pale. But the onyx combines both these peculiarities, being both black and pale.

The onyx and sardonyx are sometimes combined in one specimen; dark brown and black and white layers being followed by those of red and white; so says Mr. King, of the Arabian variety of onyx, in his work on "Antique Gems," page 9.

The onyx and sardonyx when of small size, are of little value; but first-class specimens of large size, such as we have no doubt were used in the dress of the High Priest, would now fetch good prices. Mr. Emanuel says he has seen onyxes sell for £200 (page 166).

The black layer of the onyx was a type of sin and the white of purity; the red layer over these points to blood, by the shedding of which purity was attained. This is no doubt the explanation of its position on the shoulder of the High Priest.

The statement of Josephus receives additional confirmation, when we remember that the sardonyx represented flesh and blood; which, placed upon the shoulder where a yoke would rest, thus represented the burden of the people of Israel, borne by the Priest as a fleshly instrument.

The *sardius* was the sixth stone of the foundation of the wall of the New Jerusalem. The word translated *sardius* in Exodus xxviii. 17, is (אֹדֶם) *ôdem* in the Hebrew, and was the first stone in the High Priest's breastplate. There is no difference between the sardine and sardius.

The *ôdem* was one of the ornaments of the Prince of Tyrus (Ez. xxviii. 13). Josephus renders *ôdem* as sardius, which is but a variety of the onyx and sardonyx; and is quartz. The *sard* however, or what we understand by it, is of a brighter colour than the sardonyx, more approaching the colour of blood, and does not properly form layers of different colours. It is, however, frequently yellow; but the red variety being most esteemed by the ancients, was the one probably referred to in the Bible; more especially as the Hebrew word *ôdem*, is thought to be derived from a root signifying red. The word *edom* connected therewith means red.

The sard is equally adapted with the onyx for sculpture, retaining for a very long period the traces of the workman's tool.

The seventh foundation of the Heavenly city was a chrysolite (Rev. xxi. 20), identical with the oriental topaz, which is of a golden colour, while the topaz of the High Priest's breastplate or (פִּטְדָה) *Pitdâh* was of a green colour.

According to Pliny, the topaz was obtained from an island in the Red Sea call *Topazos*, which was shrouded in mists, and was thus often passed by the ships in search of it. It received the name *Tapazin* from the Troglodyte language, in which it means *to seek*.

The *Pitdâh* is one of the stones mentioned in Ezekiel xxviii. 13, and in Job xxviii. 19; it is said to come from Ethiopia. The *Pitdâh* of the Hebrew Bible is identified in the Septuagint, by Josephus, and in the Vulgate with the τοπασιον. This is, doubtless, our modern chrysolite, which was the topaz of the Old Testament, and is totally different from the chrysolite (χρυσολιθος) of Revelation.

The chrysolite, peridot or olivine, is very soft, occurring in basalt and meteoric iron. In Bohemia, Greenland, Egypt, and Brazil, the transparent varieties are found. It is principally a silicate of magnesia, when transparent it contains protoxide of iron, oxide of manganese and alumina; the colour is green, varying in shades most commonly approaching that of an unripe apple; it would be very appropriate as regards harmony of colour, as being next to the sard or sardius in the breastplate. Chrysolite is understood for topaz, and the (בָּרְקַת) *Barĕkâth* or carbuncle of the authorized version, Exodus xxviii. 17, is most probably the emerald, or the deep green emerald beryl. So that the first row of the breastplate, would contain one red stone,

a pale green and a dark green stone. Some think the emerald-green carbonate of copper was the *Barĕkâth*, it was believed to be one of the stones referred to by Pliny, and was probably one of the twelve kinds of *Smaragdus* mentioned by ancient writers, which appears to have been a sort of general name for green glass or stones.

"Juba, King of Mauritania, was said to have a statue four cubits long, made out of one single piece of chrysolite, which he presented to Arsinœ, the wife of Ptolemy." ("Diamonds and Precious Stones," p. 26.)

The topaz or chrysolite of Revelation was most likely the oriental topaz of a golden yellow colour. The topaz is a double fluoride of alumina and silica. It is found in a great variety of localities, from Siberia to Saxony, from St. Michael's Mount, Cornwall, to Brazil. But those from Cornwall are generally considered less perfectly crystallized.

The golden coloured stone is a type of the glory of the Heavenly city. The topaz is found of almost all colours; but these with the exception of the golden chrysolite or our yellow topaz, were not probably referred to in Scripture.

Brazilian topazes are the finest, and in a rough state are sold at £4 the kilogramme. Our Scotch mountains afford true topazes, as well as rock crystals of a yellow colour, which last are known by the name Cairngorum.

The Beryl of Exodus xxviii. 20 (תַּרְשִׁישׁ) *Tarshish*, was probably so called from the locality where it was obtained. It is nearly certain that this *Tarshish* was the golden topaz, which was also one of those stones that adorned the king of Tyre (Ez. xxviii. 13.)

In Ezekiel i. 16, it is said, "The appearance of the wheels and their work was like unto the colour of a beryl," or *Tarshish*, most probably the topaz, more the colour of fire as we should expect such images to be, than green, the colour of the modern beryl. Josephus and Braun understand the chrysolite by the Hebrew word, *Tarshish*, which was described as of a golden colour like the modern topaz. The Tarshish of the Old Testament would thus answer to the chrysolite of the New Testament—a golden stone.

The heavenly city was of pure gold like unto transparent glass. This would be like the appearance of the topaz or chrysolite, of a golden colour, yet quite transparent and possessing an exquisite lustre. This stone was one of the ornaments of the bridegroom. It is said, in Canticles v. 14, "His hands are like gold rings, set with beryls," or "like orbs of gold adorned with the Tarshish stone," as rendered by Mr. Houghton (Smith's *Dict. Bib.*) This last appears to be the correct rendering of the passage. The hands being like orbs or rings of gold, refers to the fingers themselves; these with the thumb form a ring which, being decorated with these golden topazes, would shine like gold. If this conjecture is correct, it would be highly appropriate. It is supported by Josephus and the Vulgate.

The English translation, beryl, does not rest on any evidence whatever, while the above is, at least, somewhat more likely. The beryl of the New Testament may represent another shade of the topaz, which varies from pale yellow to deep golden or amber in hue.

Topazes are not much valued nowadays, as the stone is out of fashion. The pink topaz is the most popular, but it is exclusively an artificial production. Topazes are naturally found of a greenish-yellow, when they are termed Brazilian chrysolites; pale green, like aqua marines; light blue, when they are called Brazilian sapphires; and *nova minas*, when they are colourless. The topaz is difficult to polish, on account of the cleavage

surface. A large and fine topaz will not sell now for more than a few shillings, and in the rough state are worth from 5s. to 10s. per ounce. The pink topazes are worth from £2 to £10 per ounce.

The tenth stone that garnished the wall of the heavenly city (Rev. xxi.), was a chrysoprasus (χρυσπρα), which name is derived from two Greek words signifying, the juice of the leek and golden spots. Pliny called it *Pardalios;* but there is every reason to believe that a stone is intended, such as the chryso-beryl, which is of a golden-green hue, very hard, and of great value when crystallized. It is a compound of alumina, glucina, and protoxide of iron, coloured with oxide of chromium, which gives it an asparagus or leek-green colour, which sometimes approaches that of gold, probably from the iron being contained in larger proportion in such a specimen.

Chryso-beryl is found in Brazil, Connecticut, and the Ural. The green quartz known by the name of chrysoprase, is found in Egyptian monuments fashioned into ornaments, and might have been (as known to the ancients) the stone referred to in Revelations, although the present localities of its matrix are like those of the chryso-beryl, far distant from the Bible lands. Its colour is not quite so remarkable a union of green and gold as the chryso-beryl, but still it comes near that hue.

The most valuable variety of chryso-beryl is the cymophane, or Oriental Cat's-eye, specimens of which are worth from £100 to £300, but £1000 was lately given for one. The author saw a chryso-beryl in the International Exhibition, weighing about 100 carats, for which a London jeweller asked £250. But Mr. Emanuel says that the value of these transparent stones is quite nominal. The light of the glow-worm is nearest in colour to the chryso-beryl of any hue we know in nature. The tints of the sky, varying with time and temperature are best illustrated by the transparent precious stones.

The jacinth, which garnished the eleventh foundation—the *hyacinthus* of the Greeks—is believed to be identical with the Hebrew (לֶשֶׁם) *leshem*, translated ligure, by some identified with turquoise, but we think erroneously (Exodus xxviii. 19). This hyacinth or jacinth was of a bright red colour, more inclining to yellow than the garnet, which commonly is somewhat purple, while the jacinth is of a fire-light red tint.

The hyacinth or jacinth is a silicate of zirconia, coloured by the red oxide of iron. It is a very hard stone and of a magnificent flame colour. "Those that sat on the horses wore breast-plates of fire and jacinth and brimstone" (Revelation ix. 17). This hard stone which is immensely tough, would fitly form an invulnerable shield of a fiery hue. The zircon loses its colour when heated, therefore the breast-plates could only have resembled the colour of this substance when cold, but at the same time, it phosphoresces and sparkles, yet when red hot any stone would glow.

The zircon or jacinth is found in Norway, Siberia, New Jersey, and Ceylon. This stone was said by Theophrastes, to possess a power of attracting small substances when electrified, like that of amber. Hence the apparent signification of the name, applied to it in the Septuagint which means *to lick.*

The twelfth and last stone which garnished the foundations of the Heavenly city was an *Amethyst;* as was also the third stone in the third row of the High Priest's breast-plate, it is in the Hebrews (אַחְלָמָה) *Achlâmâh.* Most authorities agree that the amethyst quartz, a relatively soft stone, is here referred to. The oriental amethyst was not pro-

bably known to Pliny, who considered the amethyst a soft stone easily cut; while the amethyst variety of corundum or oriental amethyst, is one of the hardest of gems.

The amethyst quartz is extensively distributed, and consists of nearly pure silica, coloured with oxide of manganese. Heintz's analysis of a deep purple Brazilian amethyst, was:

Oxide of iron 0·0187; Magnesia 0·0133; Lime . . 0·6236; Soda . 0·0418;

The Greek name is somehow connected with wine, and the stone was supposed to have the magic power of recovering intoxicated persons, when worn as an amulet. Some varieties of the stone approach claret in hue.

The amethyst-quartz, varies greatly in value according to fashion, of late years it has risen. It is found in Scotland, Kerry—Ireland, Mount's Bay—Cornwall, near Bristol, India, Ceylon, the Brazils, Persia, Siberia, Hungary, and many other localities.

Amethysts in the days of Pliny were of immense value. In 1652, according to Emanuel, page 159, an amethyst was equal in value to a diamond. A first-rate amethyst of a very deep colour, the size of a two-shilling piece is worth at present from £10 to £15; but pretty cut stones of smaller size range in prices from one shilling and upwards; the light varieties are not worth much more than the cost of cutting.

"And I will make thy windows of agates, and thy gates of carbuncles, and all thy borders of pleasant stones" (Isa. liv. 12). The word translated carbuncle in this passage, is in the Hebrew (אֶקְדָּח) *Ekdâch.*

For Jerusalem shall be builded up with sapphires and emeralds, and precious stones. Thy walls and towers and battlements with pure gold; and the streets of Jerusalem shall be paved with beryl and carbuncle, and stones of Ophir (Tobit xiii. 16, 17). The etymology of *Ekdâch*, signifies to burn and to send forth lightning or flash. Highly appropriate to the carbuncle which has a glowing, burning appearance, like burning carbon or charcoal. Hence its English name.

The carbuncle is but garnet cut *en cabochon* with a smooth rounded top, which is commonly hollowed beneath, to lighten the colour of the stone. The most valuable variety is the oriental garnet of India, Pegu, Ceylon, and Brazil. The garnet is of most value to the modern jeweller when cut *en cabochon*, and when very large is sometimes worth £20; but good small specimens are not worth more than two shillings. The pyrope or Bohemian garnet, is usually of a deeper colour than the oriental, and much harder; it is much used in Germany and Austria, being abundant in Bohemia and Saxony. The essonite or cinnamon stone is of a fine reddish-yellow colour, and though a variety of garnet, is often, from its similarity, mistaken for the jacinth,

"The price of wisdom is above rubies (פְּנִינִים) *Penînîm*" (Job xxviii. 18). "She (*Wisdom*) is more precious than (פְּנִינִים) rubies" (Prov. iii. 15). "Who can find a virtuous woman? for her price is far above rubies" (xxxi. 10). "Her Nazarites were purer than snow, they were whiter than milk, they were more ruddy in body than rubies" (Lam. iv. 7). In all these passages *Penînîm* is the word. It is of doubtful signification; some think it refers to coral, which is however usually rendered by another word. Others think pearls were intended, but the ruby is perhaps the best rendering, it being the most precious of stones; although coral was and is valuable. A ruby is more like the tint of the red in flesh than any of the other red stones except coral and sardonyx.

The lips are in modern times often compared to coral. Of these passages quoted above, some may favour the supposed resemblance between the colour of coral, and parts of the human body.

The ruby is the most precious of known substances. It is found with sapphires, zircons, spinels, peroxide of tin, magnetic iron, rutile, and topaz. Rubies and sapphires generally indicate the presence of gold. The principal localities in Europe are the rivers Espailly, in the Auvergne, and Iser, in Bohemia; Hohenstein, on the Elbe, and various parts of the Rhine and Danube; but the ruby mines of Birmah, and those in Ava, yield the finest specimens. Those of Birmah have "long been known, and the king is said to possess the rarest and most wonderful specimens. They are worked by sinking shafts until the ruby-producing soil is met with, which occurs at various depths, sometimes within two feet of the surface, sometimes thirty feet below it. When this stratum is found, it is followed up until it becomes necessary to sink another shaft, or until it is exhausted. The stones found are almost always small, and seldom free from defects. The rhombohedral crystals are rarely perfect, and usually worn down into rounded surfaces. These mines are rigorously guarded, no European being allowed to approach them on any pretence. They are a royal monopoly, and fine stones can only be smuggled away, as the order is to retain all for the king's treasury. When a particularly large and fine stone is found, it is usual to send out a procession of grandees, with soldiers and elephants, to meet it. One of the titles of the king of Birmah is 'Lord of the Rubies.' In Ceylon, whence occasionally come some fine rubies, they are found in the beds of the rivers. The blue variety, the sapphire, is much more frequently met with, and the crystals are generally of a much larger size than those found in Birmah. Some specimens have lately arrived here from Australia, but they are not of good quality" (Emanuel, p. 104).

Rubies vary in value with tint, the favourite colour being a vivid blood-red, termed "pigeon's blood" by jewellers. When well crystallized, and free from cloud or flaw, according to Mr. Emanuel (p. 109), a ruby of 1 carat weight is worth £14 to £20; 1½ carats, £25 to £35; 2 carats, £70 to £80; 3 carats, £200 to £250; 4 carats, £400 to £450. A ruby of 100 carats weight would be the most valuable gem in existence; surpassing in value the finest diamond (*ibid.* 112), while a sapphire of the same size and weight would only be worth from £2,000 to £3,000.

"The King of Birmah is said to possess a ruby as large as a pigeon's egg of extraordinary quality, but no European having seen it, its existence may not be a fact" (*ibid.* 108).

A perfect sapphire, having the colour (which is very rare) equally diffused in the stone, and of a rich blue colour, which does not change to an amethyst hue by candle-light, of one carat weight, is worth £20.

Small rubies have been made artificially in colour and crystalline form like those naturally found, but they cost more than they are worth.

The Spinel or Balas ruby has been so frequently confounded with the red variety of corundum, both in ancient and modern times, that some mention of it is necessary. It has blue, green, yellow, white, and violet varieties like corundum; to these may be added an opaque-black variety, the pleonast or the ceylonite, containing oxide of zinc. The Spinel ruby has mostly a yellowish-brown tint mixed with the red, which detracts from its

beauty; it is like a garnet in colour. The blue variety, sapphirine, from Aken in Sweden and Straskan in Moravia, is of a pale blue colour, resembling a light coloured sapphire. The chloro-spinel is like a green garnet. The white spinel of La Ricca, near Rome, is much less brilliant than a white sapphire; while the rubicelle is like a jacinth. The violet spinel is known as the almandine ruby. The term balas is connected with the Beloochistan and Badakschan or Balaschan. The Persian name of the stone is *Badakschiani*. All the coloured varieties of the spinel are very inferior to the corresponding ones of corundum in colour, brilliancy, and hardness; they are, however, of considerable though varying value. Mr. Emanuel says, "A stone weighing 40 carats, of good quality and clear, was sold in 1856 for £400; in 1862 it realized by public auction, £80; and was lately sold for £240. The present value of spinels varies from 10s. to £8 per carat" (p. 123).

Mr. Emanuel mentions some curious ancient superstitious uses connected with precious stones. He says, "A particular stone was supposed to be sacred to each month, and they were called zodiac stones. They were all set together in an ornament called an amulet, so as to be sure to have the one in connection with, or corresponding to, the particular sign or month of the year. The order is as follows:—*

Jan.	*Aquarius*	Jacinth or Garnet.
Feb.	*Pisces*	Amethyst.
Mar.	*Aries*	Bloodstone.
April	*Taurus*	Sapphire.
May	*Gemini*	Agate.
June	*Cancer*	Emerald.
July	*Leo*	Onyx.
August	*Virgo*	Cornelian.
Sept.	*Libra*	Chrysolite.
Oct.	*Scorpio*	Aquamarine.
Nov.	*Sagittarius*	Nopaz.
Dec.	*Capricorn*	Ruby.

This is but a small part of the superstitions connected with precious stones, for the diamond was supposed to drive away *lemures*, *incubes*, and *succubos*, and to promote courage. (See Serapius.) The jacinth produced sleep; the balas-ruby curbed wrath, and preserved from lightning; the emerald discovered fraud; the sapphire induced kingly favour; the chrysolite discovered poison. In the Christian dispensation, the symbolism of stones was applied to the twelve apostles. Peter is represented by the Jasper; Andrew by the sapphire; James by the chalcedony; John by the emerald; Philip by the sardonyx; Bartholomew by the cornelian; Matthew by the chrysolite; Thomas by the beryl; Thaddeus by the chrysoprase; James the lesser by the topaz; Simeon by the jacinth; and Matthias by the amethyst.

We shall conclude the chapter on precious stones by some quotations. Josephus says, describing that most important of all ecclesiastical decorations, the breastplate of the Israelitish High Priest: "There was inserted (into the breast of the ephod) a piece, the bigness of a span, embroidered with gold and the other colours of the ephod, and was called *essen* (the breastplate), which in the Greek language signifies 'the oracle.' This piece exactly filled up the void space in the ephod. It was united to it by golden rings at every corner, the like rings being annexed to the ephod, and a blue ribbon was made use of to tie them together by these rings. . . . . Twelve stones also there were upon the breastplate, extraordinary in largeness and beauty; and they were an ornament not to be purchased by men because of their immense value. These stones, however, stood in three rows, by four in a row, and were inserted into the breastplate itself, and they were set in ouches of gold, that were them-

* Emanuel, p. 28.

selves inserted in the breastplate, and were so made that they might not fall out. Now the names of all these sons of Jacob were engraven in these stones, whom we esteem the heads of our tribes, each stone having the honour of a name in the order according to which they were born; and whereas the rings were too weak of themselves to bear the weight of the stones, they made two other rings of a larger size, at the edge of that part of the breastplate which reached to the neck, and inserted into the very texture of the breastplate, to receive chains finely wrought, which connected them with golden bands to the tops of the shoulders, whose extremity turned backwards and went into the ring in the prominent part of the ephod; and this was for the security of the breastplate, that it might not fall out of its place."—Whiston's "Josephus," Antiq. III., 7.

The daughters of Sir Anthony Rothschild, in their "History of the Literature of the Israelites, according to the Old Testament and the Apocrypha," thus comment on Kalisch: "Nothing represents both the origin and destiny of man in a more striking and more beautiful manner than precious stones carefully worked out. Like the jewel, man is a child of the earth; but as this earthly frame encloses the breath of God and an eternal soul, it is a precious treasure in the eyes of God; he values man as bearing His image and His indelible impress. But it is the aim of man to train himself from a creature of the earth into a denizen of heaven, to transform the gloom and heaviness inherent in matter, into the aërial brightness which is the essence of the spirits; and the smiling splendour of the precious stones, which are, like him, taken from the same dark womb of the common mother, symbolize to him that internal regeneration, that ascending from earth to heaven, from impurity to purity, from worldliness to sanctity, which is the innermost tendency of the Mosaic dispensation. But, further, the jewels are, among all ancient nations, regarded as the foci of light, as the eyes of the earth; they are the emblems of the stars, which they rival in splendour; their brilliancy recalls the brightness of heaven; and if the names of the tribes were engraven on twelve stones, the hosts of Israel were reminded to strive after the light and the purity of the heavenly hosts."

The Urim and Thummim, is by many supposed to be a brilliant light—a supernatural fire, which shone from the stones of the breastplate, as worn by the priest in the Holy Place; this is described by Josephus, who however tells us that this exhibition ceased 200 years before his time. But from Ezra (ii. 63) and Nehemiah (vii. 65) the power of divination alluded to here, one of the principal applications of the Urim and Thummim, appears to have been lost in their time—perhaps at the destruction of Solomon's Temple. The characters on the breastplate, according to the Rabbins, were engraved, not in the ordinary way, but by tracing the words in the blood of a worm, called *Samir*, which had the power, like the modern hydrofluoric acid, of etching characters on stones. Mr. King thinks that this is entirely a mistake. The words Smir or Samir undoubtedly mean corundum, which was no doubt used by the ancient engravers for their work. But we think that it is not impossible that hydrofluoric acid was used, for fluorspar was well known to the ancients, and nitric acid to the ancient Egyptians, which is proved by the nitrate of silver stains on the mummy cloths; and if nitric acid were known, sulphuric, the principal agent in preparing it from its sources—nitrates—must havebeen known too. With sulphuric acid and fluorspar, hydrofluoric acid is

prepared by the simplest of processes, and with its aid it is easy to etch on any stone. This view would not militate against the corundum being the true *Samir*, for the same name as a stone would naturally be given to a fluid, possessing similar properties. Increased probability is given to this when we consider that chemistry had its origin in the Bible Lands under the name alchemy. But it is possible that the Rabbinical notion, if of a worm at all, might have been founded, as Mr. King thinks ("Gems and Precious Stones," page 331), on that of Heraclius, who gives a recipe in his *Artibus Romanorum* for softening gems for engraving upon, in which earth-worms are a principal ingredient. It would be interesting to trace the history of the breastplate described by Josephus, the spoil of the Temple destroyed by Titus, from which it was transferred to the Temple of Peace, which his father had erected at Rome. But where is the breastplate now? Some say that Genseric, the Vandal chief, sent it to Carthage when Rome was sacked, and that the ship containing it, and other utensils of the Temple, was lost. But an equally plausible account is that they had fallen into the hands of Alaric a generation before. Mr. King conjectures that some of the relics of the Temple may be in some unknown treasure-chamber of a Persian capital.

DRAWING AND PAINTING FIRST TAUGHT BY NATURAL FORMS.

An Argument for the Close Study of Nature.

As, from natural objects in my possession, I am prepared to prove that the arts of writing, reading, and arithmetic were probably taught to the primeval man by a study of these forms, so, on similar grounds, I am led to believe that the arts of drawing and painting were first taught by nature. Almost simultaneously with the art of writing—if, indeed, not prior to it—must have arisen the art of design. If we enter a museum and look around, we are soon struck by the repetition of forms again and again on natural objects. Modern nomenclature recognises this, by the perpetual repetion of names originating with these resemblances. Thus, on *Acherontia atropus* (4), the European death's-head moth, we see the European head form of skull displayed. Upon the Indian variety of this moth (5) the skull shown is more of a Brahmin type. Upon *Acherontia lethe* (6) the skull is of a Mongol type. In the annexed plate a representation of the various outlines is given, the numbers having reference to the specimens described in the text.

But insects do not alone remind us of man osteologically; on a papillio is a recognisable portrait of Napoleon I. (7); a beetle which shows a minute profile bust of the unfortunate Louis XVI. (1), which may be compared with a natural bust on agate of King George III. (2) of England.

On a *Morphio* (35) butterfly a human bust is clearly shewn; and on a small mocha stone, a bust of a negro (3) wearing a white shirt, and showing a tuft of white wool on his forehead. On the small British moth, *Euclidea mi*, known as Mother Shipton (26), a Punch-like nose and chin have long been observed; also a mask-like face (13) on another butterfly. On a small piece of flint,

a very close resemblance is seen in relief to an anatomised human head (9) so prepared as to expose the muscles. On small pieces of chalcedony, fœtal forms (11) are visible, while a piece of hematite represents the shape of the arbor vitæ (12) of the brain. A crab received its name from the supposed resemblance to Cassibelaunus, King of Britain. Of two specimens, one is like a figure clothed in armour (69), another a crowned figure (62). A monstrosity of the egg of the common fowl is of a nipple-like form. Numerous flints also represent different parts of the human body, as the fingers, legs, &c (71, 72). At Lewes, twenty years ago, the writer saw a statuette—if such it might be called—which was composed of a variety of these queer-shaped flints, each of which, being of the natural form of some part of the body, was, by an ingenious mechanic, united together with Portland cement. A Herculean arm (8) is shown in the form of a stalactite from Devonshire. On *Acronycta ligustri* (21), a small British moth, a dog's head is visible. On *Megostoma cestonia* is the head of a King Charles's dog (15); on two species of Heliconias, the head of a fish and of a Cetacean (17, 18); and on *Cerura vinula*, the puss moth, the head of a cat is visible. On a small piece of agate are the figures 65, and a form resembling that of a quadruped with a trunk, allied to Elephas or Mastodon. But the size is too minute to show the form without a close examination. On *Colias helice* (14) the profile of a seal is seen; the operculum of a *turbo* (10) simulates exactly a human ear; a stalactite (23) resembles a cow's teat; a nodule of pyrites (29) resembles the knob of a staff; a section of fossil palmwood (31), from South America, shows numerous marks like monkey's skulls; a flint exactly resembles a shin of beef (32); the screwberry *Prosopis pubescens*, a corkscrew spring (28); a mocha (31A) shows a likeness to a growing plant; a butterfly (34) an eclipse of the sun; leaves are traced on butterflies' wings (36-42); a flint resembles a Wellington boot (37); and dendritic marks like seaweed are seen on limestone (38). A seed of a water-plant of China, *Strapa bicornis* (43) shows an extraordinary resemblance to a buffalo's head and horns. Flints show sketches of a knight's helmet (44) and a map of Australia (46); a piece of marble (59) shows a rug with a clear representation of a tiger's head; the beetle stone (63) is well known; a Kaffir in his cloak is seen on an Egyptian pebble (65); a wheatsheaf on a Brighton pebble (70); a flint (66) simulates a coprolite; a cotham lias slab (74) a grave or timber yard; and the keyhole limpet *fissurella* (68) is palpable.

A shark's tooth is seen on a butterfly (25), and another on a mocha stone (48). The form of a pig's head is assumed by a nodule of pyrites (30); a cave bear (54) and a king vulture's head (50) are to be seen on pieces of agate. The sternum of a bird is likewise on agate (51); and as a curious instance of assimilation without a reality, I may mention a mocha in which dendritic marks have assumed the form of a fish (55). A mocha displays an ostrich drinking, with a bush against its back and the sun setting in the distance (56). The bleeding tooth, a species of *Nerita*, a mollusc, has long been noticed. On *Phasianella Australis*, another mollusc, a group of scorpions may be seen; on a flint, the outline of a sheep in repose (61); a piece of pyrite assumes the form of leaves with a dentated margin (67). Among a hundred molluscs, resembling man's utensils and bodily parts, may be mentioned one—the "shuttle," *Ovulum gibbosum*. Two mochas are especially interesting; they illustrate ornithology—one a water bird and its young, apparently a *Notornis* (47); another the owl *Athene meridionalis* (27), which is

supposed to be the bird of Minerva figured on the coins of Athens. On another are seen the sun and moon (45). Upon some red oxide of manganese (49) are marks resembling a stand of birds.

Among the implements or utensils of men may be instanced a pair of boots on the butterfly, *Victoriana Stenalis* (20); a lace-like collar on *Neptis* (60); and organ-like pipes on *Papillis* (40). Upon the genus *papillio* almost every variety of form known amongst the flint-scrapers, celts, and arrow heads is illustrated (41). The form of a plough is well seen on *Nemophila plantagenis*, the little wood-tiger moth of our groves. The great tiger-moth, *Arctia caja*, also shows the plough occasionally. Several species of the genus *Saturnia* show transparent spots of a diaphanous structure, which has caused French naturalists to call them *porte miroirs*. A piece of onyx displays very clearly that tool of the chemist, a mortar (53). A nodule, naturally polished, reminds us strongly of a grape shot. The Egyptians invested their sacred beetle, *Ateuchus Sacer*, with supernatural importance. It was sacred to Cheper, the Creator, from its habit of collecting materials to form a circular egg-case for the reception of its eggs, typical of the creation of the world. Pope Gregory, while lamenting the idolatry of the Egyptians in worshipping beetles, considered this insect the type of the beast which had seven heads and ten horns. On examining it closely it is seen to have seven lobes on its head, one of which is divided into two, which is more striking, as the passage in Scripture speaks of an eighth head of "the beast" united to the seventh (Rev. xvii. 11). The beetle had ten horn-like toes, and so the Pope had got hold of a very perfect illustration of his theory (33). His Holiness called this beetle *Carabus Antichristus*.

Geography is also illustrated in lower forms of life. On a South American butterfly is seen a chart of South America (58). On a mocha stone the peak of Chimborazo (39) is visible, and a view of Portland Roads, with the isle and shipping on another (52). A map of India is very conspicuous upon a large slab of Indian polished jasper (57). A piece of pyrites, found in Cornwall, is of the form of that county (64).

Insects apparently caricature themselves in some cases. Upon the back of *Goliathus cacicus* (22), the well-known large beetle of West Africa, a minute sketch of itself is seen, and this is also the case with *Stenostoma maculata*, another beetle. On a species of *grapta*, a butterfly, is seen a repetition of the insect's general form. Insects also caricature higher animals; thus there are the rhinoceros, elephant, and tiger beetles, and on *Helicornius luce*, the wing of a cherub (16). As fitting addenda to these remarks may be mentioned the butterfly *Catogramma*, which has on it the colon and semi-colon stops. Therefore, from all these facts, we may fairly conclude that Nature was the great teacher in art as in letters, and that the representations on these objects, and a thousand others, first led man to attempt to depict Nature by drawing and painting. The rough outline, probably, was drawn first, the coloured representation marked another reproduction of Nature, rather than a stage in the development of art; for is it not to nature that we look for our most perfect copies in art? Rudimentary art is but a bad copy of the simplest forms in organic life. The highest of all arts, human portraiture, is a copy of the highest of created beings —man. All his thoughts in science, and in religion even, are pre-figured and typified, if they are not actually represented by natural objects. Man's schoolmaster, Nature, in the infancy of his arts, should be his

schoolmaster now in the maturity of his civilization. Any departure from this good old path can but lead him and his arts on a road to decrepitude and decay, from which he can only escape by a return to the ways of nature, which can teach him how to paint in rainbow tints, and how to carve, whether with the marvellous minutia of detail as in insect and microscopic forms, or in the ponderous grandeur of the elephant or the whale, or in the all-inclusive form of himself, rich in angles and curves, reflecting all nature.

"Types of man's character are illustrated in all departments of nature, from the geometric cell-like plants which float in fluids, all angles and corners, requiring a microscope to bring out their traits of character, to the apes which most resemble man in form. These last imitate his gestures and habits, but like many persons who 'ape' those above them never attain to their perfect performance." Mimicry is indeed a low art, infinitely beneath the intelligent, rational reproduction of nature. No deep student of nature is ever a mimic; schools of art should be always schools of nature.

C. O. Groom-Napier.

A RUSSIAN AGENT IN BRITAIN.

The following conversation took place between an Englishman and a Russian gentleman in London on the 9th June, 1878 :—

Englishman.—"From what you have told me previously, I understand that your father was an Englishman, and, that he, fifty years ago settled in Russia, and that, marrying a Russian subject, he became naturalized, and that you were born of the marriage."

Russian.—"You speak truly. I was well educated and was for a time an interpreter in the police, but my salary was very small, not sufficient for my wants; I was very much in debt. A lady, the wife of an eminent official was most friendly with me and promised to get me a good situation, but for four years I waited. At last the lady said I should be sent for the next night. About one o'clock in the morning I was roused from my sleep by a superior officer of Police knocking me up. I dressed myself, and he ordered me to get into his carriage and come to the railway station (we were in Moscow). We went on and took a night train special to St. Petersburgh. A few hours after our arrival we went before a superior police officer, from whom, after receiving certain instructions, we went to another department of state office. I here learnt clearly that we were to proceed to England which we reached June 2nd, 1874. £100 was given me, and I was desired to seek a situation in a merchant's office, reserving myself for Government service at a moment's warning. In January, 1876, my mission began. I left my commercial post and joined my superior. I spoke and wrote English perfectly, I had the aspect of an Englishman."

Englishman.—"What were your duties?"

Russian.—"I will tell you. From January till the middle of May, I was constantly occupied in seeing persons connected with the Press and public men and talking on the Eastern Question. I employed a staff of about eight good English writers to write down Turkey and write up Russia; the humane character of the Czar, the sacred cause of the Christians in the East, subjects that are the ridicule of the intelligent in Russia. But it was

my business. Letters informed me that an insurrection was preparing in Bulgaria, and my brother was going with about 15,000 stand of arms and half a million of roubles to promote it. This money was to be pretty fairly distributed between Mussulmen and Christians. My brother had invited me to join him but I preferred remaining in England as I considered that his chance of being murdered was very great. You all know what happened; I rubbed my hands daily and set my writers to work in September, 1876, to proclaim the inexorable savagery of the Mussulmen, and the duty of Englishmen to be neutral; I now took twenty of the extreme English Liberal party entirely into my pay, feeling sure that now a glorious campaign in the interest of my country, Russia, had commenced. Sensation articles and letters were written by the hundred, and by the extensive treating of sub-editors were largely inserted. Myself and friends were voted the best of fellows! at least £20,000 was spent in feeing and entertaining. But all this time I was not stationary in London, but was wandering over the great towns of England and Scotland. My superior of the Russian police was with me, but he was so thoroughly national in his demeanour that he did not deem it prudent to appear, although he travelled with me, and had the control of the purse. When funds were wanting for the expenses of a meeting to protest against Turkish atrocities, we found them; and where speakers of Russian proclivities wished their expenses paid from long distances, or remuneration for the value of their time, it was freely done."

Englishman.—"You astonish me. If I had not known you for some years as an honourable man I should call you a liar. What political party were you most successful with?"

Russian.—"At first we were more or less successful with all parties; but latterly, our success with the Liberal party becoming obvious, we received only opposition from the Conservatives."

Englishman.—"In what character did you travel?"

Russian.—"In that of an English merchant long resident in Russia. When I did speak I spoke with great moderation; but I aimed more at circulating extracts from reports of atrocities. A good deal of this was true, but not all. I now know it was manufactured in St. Petersburg for the English market. You are an intensely credulous people, governed by sentiment and political theories that claim philanthropy."

Englishman.—"But what proof do you give me that any respectable man of our great Liberal party, received money for attending meetings for pro-Russian purposes?"

Russian.—"Here is my evidence. I claimed to represent a society of the friends of Christians in the East, an association of English and foreigners, burning to defend the rights of Christian brethren. Leading Liberals gave me the use of their names. It was like the manufacture of artificial flies, to catch the silly fish in English waters."

Here the Russian took a pinch of snuff, and for some minutes was convulsed with laughter.

"But," said he, "to prove that I am not a liar, here is a file of sixty handbills of meetings which I have got up, and here is a book of receipts of money paid to Liberals for various purposes. You will recognise many signatures."

Upon this the Russian opened a box, which contained the handbills and receipts.

"I have about 8,000 letters relating to these matters."

Englishman.—"Let me see them."

After about an hour's examination he said,—

"What you tell me seems every word of it true. A hundred years ago this evidence would have been

deemed complete for hanging at least a hundred Liberals for treason. But now, in these days of Liberalism, the British Constitution is deemed so strong as to laugh at the machinations of Liberal villains. It is an appalling discovery of roguery and hypocrisy or credulity; but what do you in Russia think of us?"

Russian.—"We hate you almost to a man, with a deadly hatred. Children are taught by their priests to apply the curses in the Old Testament on Edom and Babylon to England. If your country only pursues the policy advocated by Mr. Gladstone and the Duke of Argyll, contempt and open war would ensue almost immediately. I know German merchants who would lend Russia money to go to war with England if they thought the Liberal party was strong. But now I think the war has been fruitless as regards us, as England seems determined to adopt a national policy."

Englishman.—"What do you mean by a national policy?"

Russian.—"That of opposition to us. Russian policy has been to promote insurrection in a country, and then put it down as a nuisance, and at last annex the country province by province, proclaiming the disinterested policy of Russia and her zeal for Christianity. Words cost nothing, paper is cheap."

Englishman.—"What is now the state of Russia?"

Russian.—"It is awful, from an English point of view, and very bad from a Russian. Communism and Socialism are ready to break out at any moment in all the towns. Order is only maintained by the consciousness of a great military force. Trade is almost ruined. It will take us twenty-five years to recover from the results of this war."

Englishman.—"Which do you like best, Russia or England?"

Russian.—"England, far before Russia. I am going to be naturalized as an Englishman."

Englishman.—"Will you be a Liberal or Conservative?"

Russian.—"A Conservative. I despise the Liberals too much to join them, if I was an Englishman. For party purposes they have flattered us, and even gone so far as to prefer the interests of Russia to England; but now, as things are likely to turn out, they may be considered to have done us enormous injury, for they led us to believe that they would compel England to let us do what we liked with Turkey, and yet have been powerless to prevent Lord Beaconsfield from compelling us to submit the treaty of San Stefano to a Congress. It is true what is said in the first number of BURLINGTON HOUSE, that the guilt of the blood shed during the war was to be laid at the door of the English Liberal party. I can excuse that of the Turks; I have been trained to hate them, and thought, at the time I was in the Russian army, that I might go as a conqueror to Constantinople. But I now see this was hollow, Yankee-like bunkum; England can never let Russia go to Constantinople. At the cost of about two millions a year she could blockade our ports until our empire was entirely ruined. Seeing the resources of England, I am now convinced of it. Russia must have a Constitution, and will most likely end in being a Communistic Republic. The prestige of the Royal family is gone if they cannot enforce the Treaty of San Stefano. But I am done with Russia. I shall never return there again. If I do not remain in England I shall go to the United States. I have saved enough money from this last business to keep me comfortably. But I must say good morning, as I have an appointment."

The conversation was resumed on June 16.

Russian.—"What do you think of the alleged agreement between Schouvaloff and Salisbury?"

Englishman.—"It is a delusion and a snare, if it is genuine. If any attempt is made to carry it out, all the benefits which a recent, courageous, and judicious policy have gained for England and Europe will be lost. England is now in the position to say to Russia, 'Fulfil the pledge of your Emperor, acquire no Turkish territory, therefore evacuate it and leave to Europe the task of reorganising the Turkish empire.' The balance of power is in the hands of England at the present moment; with her is the question of peace or war, order or chaos. If her statesmen are not masters of the situation, it will be a calamity for the world."

Russian.—"You are quite right. When I started from Russia I was surprised to find many of the English completely Russianised—our humble servants; clever fools. I was a paid advocate who was surprised at the success of a bad case. What is your opinion of Gortschakoff?"

Englishman.—"I like him: he is a thorough-going follower of a policy, a faithful life-long carrier out of instructions with unscrupulous fidelity. It is a grand triumph for him to be carried from his bed to a Congress, even if a shadow of his policy receives the sanction of Europe. If it is completely successful it will be the triumph of a knavery—not his in particular—well nigh diabolical over the decrepit statesmanship of the west. Gortschakoff has a German face, one combining astuteness with an unwearied talent for the details of business, with considerable meanness and grasping capacity, yet withal a good nature calculated to make a favourable impression. He is no monster of iniquity on the very surface. Schouvaloff is a Sclavonic noble, the ideal of adroit affability which never misses his chance by flattery and be-foolery for accomplishing his ends, no opportunity will be lost for influencing women who are in the possession of secrets or who have influence over men. I may be wrong, but to this power and to the general business capacity and well balanced judgment about things in general, may be attributed Schouvaloff's success in maintaining English neutrality, without which Russia could not have had a chance of success, and which point to him on Gortschakoff's retirement as the best director of the foreign policy of Russia. Ignatieff is a man of a much lower type. If Schouvaloff is a tiger, Ignatieff is a wolf, grasping and bullying beyond either Gortschakoff or Schouvaloff. He rouses indignation by his contempt for European public opinion, requiring all Schouvaloff's tact to explain away the seeming tendency of his policy. It was the ravening of this Russian wolf that roused the British lion from his sleep."

Russian.—"You are most exact in drawing these characters. What think you of Andrassy?"

Englishman.—"He is the very worst type of man to have been at the head of affairs in Austria. Above all things, a man who knew his own mind was required; one who rigidly followed a policy antagonistic to Russia, yet conciliatory of the Sclavonic idea as regards the Sclavonians of the South. Andrassy is a man of great intellect and astuteness, equal to any one had he more resolution, but he has had great difficulties. The Austrian Empire is poor, and the many nationalities of which it is composed renders a national policy impossible. Andrassy has not the courage to follow an Imperial policy. Bismark was a man of iron will and equal sagacity and industry, but his blood and iron policy has been quenched in gout. He and the great men who conquered France under the grand king who now lies bleeding, are dying away. The plague of Socialism is rapidly advancing, every country in Europe catches the contagion more or less. The moderate republicanism of McMahon in France, ready at the

first convenient moment to resign in favour of an emperor or a king, while it gives commercial prosperity to France, and serves to cure those wounds which the good old surgeon Thiers first staunched, gives but a feeble arm with which to strike a foreign foe. The defiant policy of France, her haughty Gaulistic spirit, is subdued. France's legitimate influence even is suspended. France sadly wants a stronger man at her head; one who is a statesman, and not a mere honest, earnest, straightforward gentleman-soldier. Turkey wants not a Midhat Pasha living quietly in London, respected by those who can appreciate profound sagacity, honest purpose, and resolute will, but a Midhat Pasha directing the foreign and domestic policy of Turkey, and not merely giving birth to a constitution, but superintending its education, and leading it forth into the world of free states—a man."

Russian.—"Bravo—bravo. If the Turks do not like Midhat Pasha they should send him over to us, a better man does not exist, or one more devoted to his country. If Turkey had allowed her policy to be directed by such a statesman, we should never have crossed the Balkans; we never should have got near Constantinople; but the Turkish loss has been the Russian gain."

Englishman.—"My time is up, so I must say good morning."

The conversation was resumed on July 8th.

Russian.—"What do you think of the new Defensive Treaty between England and Turkey? Is it not an un-English measure?"

Englishman.—"I answer you with reserve. If you mean by un-English that it is the presage apparently of a policy different entirely from the miserable, cowardly, lying policy of some who claim to be leading politicians, and worthy of the British flag and the British lion, then you are right. It is a return to the good old times; and the burst of applause with which it will be greeted by the majority of European politicians will be an indication that it is a healthy, manly policy, worthy of Nelson, Wellington, or Pitt. The name of Beaconsfield will henceforth live in history as that of one of our greatest politicians, for he has accomplished without war more than Russia has gained by war, at the cost of perhaps only twenty millions. Money was never better spent. It has made England unquestionably the first Power in the world. We are the wealthiest, we have the largest population of any and the most powerful fleet, and only require to manipulate the forces of our Indian Empire well, to have at command a more powerful available army, from having command of the sea, than any other Power. Is not Russia crippled by this war? Are not France and Germany enfeebled by war? Are not Austria and Italy Powers of little belligerent tendency? England has got the balance of power for the present moment, and the great Powers, including Russia, will acquiesce in it. What say you?"

Russian.—"I do not not object to the English treaty with Turkey, on the contrary, I think with Count Schouvaloff that it is an excellent thing for Russia that intrigues in Asia Minor should be more difficult. These intrigues would be the precursors of a long and costly war with England. Russia has ample territory, she wants more men. If every Russian could have six wives and a hundred children for a century, the country would not be overstocked. I hope there will be a long peace, and a good time for trade. A general disbanding of armies. The hosts of soldiers ruin the industrious classes. England will in five years have the Euphrates railway to India, Babylon may yet rise again; Bagdad will be a second

Constantinople. Turkey will give England much trouble, but if she perseveres in the policy sketched by Lord Beaconsfield, she will make Asia Minor her own. The Sultan will be a vassal prince. The Mahommedan world will rally round England in a way which has not been done before, because of the eternal *enmity* it will owe us. In this way I think our conquests will do us but little good in comparison of their cost."

Englishman.—"The war of conquest rarely pays, more especially now when material is so costly. But I think with you we have taken on ourselves great responsibility in taking the Turkish Empire under our protection—not greater than was our duty. The Shah of Persia will be profoundly impressed by the treaty; he will see that England can do more for him than Russia. With the forty-eight millions of people which are still left to Turkey, and British organization backed by British material of war, Asiatic Turkey may feel safe from incorporation by Russia. The stage of low fever which affected the British body politic for two years, has returned to health and strength. It has only to continue to follow a wise policy to maintain the position of the first of the nations. I give Lord Beaconsfield credit for having seen from the beginning of the Congress at Constantinople that the old policy of England in maintaining the *statu quo* in the Turkish Empire would not do, hence the concessions made to Russian policy, which caused some to think that we were willing to become the humble servants of Russia. The Turks, with the pardonable pride of an independent power, declined to do all that was asked of them, hence the Berlin memorandum, and the war. English neutrality was proclaimed and conscientiously observed, the British Government declaring that its neutrality would be broken were Constantinople and the Dardanelles to be seized by Russia. And now Turkey has but one ally, and that must be her master—England. Through the Sultan England will govern the Turkish Empire, unless the decrepit statesmen who call themselves Liberal, but are the humble servants of tyrants, should manage the concerns of our Empire; then not merely Asiatic Turkey, but England will fall. But I am in hopes that the brilliant success of the bold, manly, as well as cautious policy of Lord Beaconsfield will induce similar measures to be followed by his successors, be they called Liberal or Conservative. I do not care what name politicians assume if they are but true to their country. And now, before I take leave of you, let me commend to your study the island of Cyprus, which we have just acquired, and Palestine, with its past history and future life. Should it enjoy a semi-independence? should a temple for all nations be built at Jerusalem, where Jews, Greeks, Roman Catholics, and Protestants might worship peacefully? The subject is a difficult one; much has yet to be done."

Russian.—"Cyprus is indeed a fine island. My brother has been there. It could produce every tropical and temperate fruit. It has a climate like Palestine. In English hands it will be a second Corfu. The temple at Jerusalem for all nations is a grand idea. A Jewish friend of yours told me he would like to give his whole fortune towards it. Adieu."

(*To be continued.*)

BURLINGTON HOUSE.

NOVEMBER, 1878.

MORDECAI, HAMAN, AND GOG: A DRAMA.

Persons Represented:

ESTHER, Empress of India and the East.
THE PRINCE OF GOG.
MORDECAI, a Benjamite-Jew and Patriot.
EZEKIEL and DANIEL, Prophets.
CARSHENA, a man of half measures,
SHETHAR, a clever man of business.
ADMATHA, a soft temporiser and spoon stealer.
TARSHISH, a threatening letter writer.
MERES, a good War Minister.
MARSENA, great on education.
MEMUCAN, a man of business and sense.
HATACH, a Lord Chamberlain.

(Friends of Mordecai.)

HAMAN, a troublesome Agagite, a Liberal, and a Wood-cutter.
MEHUMAN, one of the Dukes of Edom.
BIZTHA, a wholesale carpet maker.
HARBONA, the mouth-piece of Haman.
BIGTHA, a scolding Politician.
ABAGTHA, a snarling Albino, an ex-match maker.
ZETHAR, a loud Lawyer.
CARCAS, a bad Lawyer.
ZERESH, wife to Haman.
PARSHANDATHA, a babyish scribbler.
DALPHON, an anti-wine merchant.
ASPATHA, a soldier, and son of a greater.
PORATHA, a man of great resolutions.
ADALIA, a news-monger and manufacturer.
ARIDATHA, a Duke of Edom and great Householder.
PARMASHTA, who has been in India.
ARASAI, a Damascus blade.
ARIDAI, lately come from Goshen.
BAJEZATHA, a general traveller.

(Friends of Haman.)

ROS, Envoy of Gog.

ENVOYS OF SCYTHIA AND TUBAL.
CHIEF CITIZEN, LADIES.
SOLDIERS, MESSENGERS, and ANIMALS.

SCENE.—*Partly in Shushan, partly in Tubal.*

MORDECAI, HAMAN, AND GOG: A DRAMA.

Act I.

Scene I.—*Shushan, the Palace. The House of Mordecai.*

Enter Mordecai *and* Carshena, Shethar, Admatha, Tarshish, Meres, Marsena, *and* Memucan.

Mordecai. Kind friends, hearken and give your advice. I am much disquieted; last night I slept not, lest the report I hear be true that the Prince of Gog, in cruel envy of our race, prepares a murderous march of troops. Our scattered nation, under his sway, send me their cries on paper, wet with the tears of mothers, fearing the death of Judah's sons.

Shethar. And why this war?

Mordecai. The ghost of Cain, a demon of Sheitan, enters the Prince of Gog; on murder he is bent—that millions of our people and their friends of Tubal falling, the sons of Gog may take their place.

Admatha. A sea of blood you see before your eyes; it makes your head dizzy. Let me propound to you a plan by which the Prince of Gog may get all he wants without the shed of blood.

Tarshish. Bloodshed is always bad; let us avert it if we can. Shall I meet the Prince in conference?

All. Go, and God speed you!"

[*Exit Tarshish.*

Memucan. All may be well, but yet we must prepare for war Clean every sword and spear and lance; clean up our armour, and put on double plates as thick as we can carry. This Shushan expects; for, although Gog at first only threatens Tubal, yet, with the fall of Tubal, a great blow is dealt at Shushan.

[*Exeunt.*

Scene II.—*The Apartments of Esther, the Empress.*

Enter Mordecai.

Esther. How runs the world with you?

Mordecai. Have you not heard of Firbolgs, a Fenian race of fiery blood, violent in tongue and pen, cruel as leopards, quick as the lightning to destroy, and like that fluid which, in the midst of storms, springs from a cloud and strikes the tallest tree—such is the resolute intent of the most fiendish party in your State, who, like lightning, would destroy the constitution of the State by attacking its principal tree—yourself.

Esther. Who but presumes such projects?

Mordecai. Bigthana and Teresh, villains prating of liberty and preaching Home Rule, and now I come to tell you that these two seek your life.

Esther. The gallows-tree is the best tree for such. Let murderers hang, that honest men may live in peace. Take you my ring, and if, on inquisition it be found true, let them both hang.

Mordecai. It shall be done, your Majesty. [*Exeunt.*

Scene III.—*The House of Haman.*

Enter Haman, Zeresh, Mehuman, Biztha Harbona, Bigtha, Abagtha, Zethas, Carthas, Parshandatha, Dalphon, Aspatha, Poratha, Adalia, Aridatha, Parmashta, Arisai, Aridai, Vajezatha, *assembled at a Banquet.*

Haman. Hear me, ye Agagites. Can I rest quiet when a Jew sits in the Empress's gate? Although I

am by favour the greatest prince in this fine empire, yet I feel small as long as a dirty Jew bows not or does me reverence. I must bring him down. What say you all?

Mehuman. The Prince of Gog, the Jews' great enemy, is planning war; let us ally ourselves with him, and, adding our strength to his, the Jew must come down.

Haman. I will write to Gog at once.

Biztha. I am a man of peace and have been ever before a hater of war, but I hate Mordecai more than war, and feel that any means is lawful to drive him from power.

Harbona. Quite right, command my help, all I can give I will. You have named me your leader of the opposition to this accursed Mordecai; I will write to the Prince of Gog also, to send over and help us.

Biztha. Go to the Empress and say, "A queer, peculiar people, scattered through Eastern Europe and Western Asia, defy the law of nations; let them be put to death, and let their spoil go to those who care for it, and let permission be given, and let it be understood that the Empress will not interfere however many are killed.

Haman. Yours is the best advice; to-morrow I will go to the Empress.

Abagtha. A hundred curses on the bitter Jew. When I passed him the other day he cast on me a look of scorn, as if to say, there goes a low Albino, his nostrils breathing pride, his lips but curling scorn, and his eye glancing defiance; am I not in the Empress's gate? Therefore if the Jews fall, let Mordecai fall first.

Zethar I am an authority on the laws of nations, and, like all of you, a liberal man, yet I cannot endure this Jew or his people, or the sons of Tubal.

Haman Let them be driven into the sea; perish the whole nation. When this takes place we will have a feast; we will all drink each other's health. I will sit in Mordecai's place and you will be next to me. (The whole assembly applaud). The religion of Gog is so good that I feel quite of one mind with him, and hope the day will come when the three great sects of Gog, Babylon, and Shushan will fuse into one. This makes me love Gog, and as he hates the Jews I do adore him.

Carcas. I do not see how all the sects you name can ever join in peace. War, bloody war, must spring from any such attempt

Parshandatha. Although I am a champion of aboriginal rights, and make black men white, and white black with my own paint, yet these men of Tubal and Judah exasperate me. If we cannot put them to death ourselves, let us give the Prince of Gog our moral support in his good work.

Dalphon. Although I cannot, like you drink wine, and wish to see no fermented grape juice sold, yet I will join you heart and soul against the Jew and Tubal.

Aspatha. My father was a warrior, a pious soldier of our Empress in India; yet so do I hate the Jew and Tubal that I will join you.

Poratha. Let us make some resolutions.

Harbona. I will join you with them; we will draw them up together.

Adalia. Piety being my passion, I will support you in my paper. We have a large stock of news already manufactured on hand; tales of horror, rape, and blood that ought to be avenged on Jew and Tubal. Some may be true, others are not. Still we must make all the noise we can. Take you a hammer, an anvil, and a nail, and beat the nail on the anvil with a hammer—it will at last be red hot. (*The assembly applaud.*)

Parmashta. It is said that Gog aims to destroy our Indian Empire, but I think this a false alarm. Long have I lived in India, and with my friend and kinsman, Mehuman, most deeply hate vile Tubal.

Aridatha. At a meeting where I took the chair, a righteous meeting, where all classes spoke, the cry was general, "Drive out Tubal," and, if necessary, "Perish our Indian Empire." Are we all agreed?

All. Yes. [*Exeunt.*

SCENE IV.—*The Palace at Shushan.*

Apartments of Esther, the Empress.
Enter HAMAN *and* ABAGTHA.

Haman. By your command I come to your banquet. I have but one request. There is a people scattered throughout Eastern Europe and Western Asia which keep not the law of nations, and who cruelly destroy those of your own religion. Myself and friends, assembling in council, have heard the Prince of Gog wishes with force to drive them out, and wants to know if you will let him.

Esther. Gog has been our enemy, and has for many years threatened our rule in India, and it has been ever thought that he first aims to conquer Tubal, and then to conquer India. Gog is a mean and treacherous power, given to intrigue, to treachery, to sowing dissensions in Scythia amongst its Princes, and then in league with neighbouring powers to occupy and divide the country.

Haman. That might be true of Gog in days gone by; but the present Prince is one so liberal, so benevolent. Is not his daughter in alliance with your house? Did he not set free millions of slaves? We must not deceive ourselves; war between Gog and Tubal is determined. The interests of Shushan and trade require peace. I hear that Tubal has lately killed many of your faith. Shall they not be avenged?

Esther. Yes, they must be avenged.

Haman. And those who conspire with Tubal among your own subjects, shall they be put to death It will be profitable to your empire, and some million talents of silver it will bring into the treasury, for these enemies of your throne are rich.

Esther. Yes, surely. Take you my ring, and make out your decree; but silver is cheap at present, and I have enough of it.

Haman to Abagtha. Take you a pen and paper, draw up a decree.

(*Haman and Abagtha draw up the decree, and exeunt.*)

SCENE V.—*The bed-chamber of Mordecai.*

Enter MORDECAI, *on his knees.*

My God, my God, what dismal news! (*Reads the decree.*) "To all people, nations, and languages: there are scattered throughout the Empire people known as Jews or Tubal, stubborn and rebellious people, peculiar in faith and disobeying the law, therefore it is decreed that they must die. Now let all loyal people assemble themselves on the 14th day of Adar (*Valentine's Day*) and help our troops to put them to death. Given at Shushan the Palace, by the authority of the Empress. (Signed) Haman."

(*Mordecai laments*). This is no love bird's note. What good can life and honourable power give me? I am sitting in the seat of honour, and yet how can I endure to sit here if my people and their friends are doomed to death? Accursed Haman, bloodthirsty wolf, ravenous to feed on the lives of nations if he can but get power thereby. And what is it for? It is my seat he wants rather more than a square foot of cushion in the Empress's gate. And to gain this he is willing to murder a nation, and half dethrone his sovereign! Most villainous ambition. At the last royal feast he must have drunk to

the dregs his cup. I heard that as he put it to his lips a hornet as thirsty as he lighted on it. O cup of wormwood, maddening to the mind, leading to sullen revenge, but bringing a fearful doom of wrath from heaven. God grant me deliverance and my Empress, for in this scheme of Haman I see a plot against the throne. Haman wants to be king; may he be accursed. May God deliver me from him.

(*Mordecai retires to bed, but cannot sleep.*)

Mordecai. A thousand copies—twice five hundred—of this decree sent by posts to all parts of the Empire! What will the Prince of Gog think? Will he not fiercely attack Tubal, and will not millions fall? Yes, millions of Judah and Tubal. Half our nation is in the land of Gog, in his power. I cannot lie in bed. (*Mordecai gets up and walks about; opens his window*). I hear a watchman cry it is the sixth hour of the night. It looks a gloomy night. Not a lamp of heaven seems burning through those rolling, dark, smoke-like clouds. The air is heavy. Not a leaf stirs, so that the wild and mournful dog has all his howl alone. Perhaps in a few days he may growl over the corpse of a Jew. I must put on sackcloth. But I must first see the Empress and let her know the truth. O most villainous, mischievous, and wicked Haman

[*Exit.*

SCENE VI.—*The banqueting chamber of Mordecai's house.*

Enter MORDECAI *and his friends* CARSHENA, SETHAR, TARSHISH, MERES, ADMATHA, *and* MEMUCAN.

Mordecai. You have all read the decree?

Memucan. We have, all—a most cold-blooded paper it is. None but accursed Haman could contrive it. It is ferocious Agag in every word. But the words of old Samuel comfort me—"As thy sword hath made women childless, so shall thy mother be childless among women."

Admatha. How cross you are, Memucan.

Memucan. When fire burns at a man's gate should he not stir? When ruffians threaten outrage to his daughters should he not move? No more stones of Derbyshire spar, give me the flint, the adamant. Now is the time to strike.

Meres. Yes, we must be hardy and not walk in the milk-and-water paths of Admatha, but show that we are men; look to our armour and our swords; and save our lives by not being afraid to die.

Carshena. Your language is too violent and will provoke the death you fear. I for one would meet Haman half way. Beg his pardon, for any little misunderstanding. For he says of you, Mordecai, that you have not bowed to him as you met. Invite him to your house and shew you are his friend, and then ask the Empress to reverse the decree as regards the Jews.

Admatha. You speak right. By all means make friends with Haman.

Mordecai. That can never be. Haman and I can never meet as friends. One of a base Agagite race! to bow to him; to do him reverence. It is impossible. Throw stones of flint or adamant, bad stone, rotten stone, what you like. War, war, war. Peace is impossible where there is an enmity of centuries.

Tarshish. From what Admatha says, the Prince of Gog wants to confer with us. He says, 'let me take the head and trunk of Tubal, take you the legs, which stretch to the rivers of Ethiopia, and let Southern Scythia take the arms.' Shall we meet Gog in conference?

All. If please the Empress.

Mordecai. Time runs upon its four legs up to the gates of Death, and says, 'give me the bodies of the men of Judah and Tubal.' Is not

the day fixed? Go to the conference if you like, but go to the Empress first, and demand the reversal of the decree. If it is not done to-day it will be too late. Shall I go? Indeed I must go, for my fate hangs on it. Am I not a Jew?

All. Go. None of us wish bloodshed.

Admatha. Shall I write and say we will confer with Gog about Tubal?

Mordecai. Yes, and ask the kings of Gaul, Scythia and Rome to come.

Meres. Yes, they must come.

(*All exeunt but Mordecai.*)

Enter MESSENGER.

Messenger. The city Shushan is perplexed. The decree touches so many interests, and so many lives hang in jeopardy, that many are ill: hundreds in sackcloth, especially your people the Jews. A great meeting at the Synagogue is called, all are to wear sackcloth.

Mordecai. Is opinion much divided in the city?

Messenger. It is, my lord. Half hold with Haman and half with you, my lord. There have been many tumultuous meetings of late; Haman preaching peace, and gainfull traffic is much praised. You are much cursed. Haman has spoken much, cursed you in public, and said that you shall sit no longer in the Empress's gate, but shall die.

[*Exit Messenger.*

SCENE VII. *The Palace of Esther the Empress.*

Enter ESTHER *and* MORDECAI.

Mordecai. May you live for ever.

Esther. What is your petition, Mordecai? and it shall be granted, even to the half of the kingdom, for did not you make me Empress?

Mordecai. Have you not often said that the best of your subjects were Jews, and that they had much sympathy for your friends and allies, the men of Tubal.

Esther. Yes, truly they are good people. How can I favour them? I wish them to enjoy their rights, the precious bounty of the golden wheat, the lesser gifts of silver rice and olive oil; wine without stint, and milk without measure. Do you claim for them a release of taxation?

Mordecai. I claim for them only life, and that I request. Will you give it?

Esther. Yes, surely. To-morrow I give a feast; Haman is coming; will you come?

Mordecai. My greatest service is at your command; of course I come.

Esther. And now peace be with you until to-morrow.

[*Exit Mordecai.*

SCENE VIII.—*The house of Haman, A breakfast chamber.*

Enter HAMAN, PARSHANDATHA, PORATHA, DALPHON, ADALIA, ASPATHA, ARIDATHA, HARBONA, CARCAS, and MEHUMAN.

Haman. Take comfort friends and brother Agagites. Hear this Decree: "To all people, nations, and languages: there are scattered throughout the Empire people known as Jews and Tubal, stubborn and rebellious, peculiar in faith, and disobeying the law, therefore it is decreed that they must die. Now let all loyal people assemble themselves on the 14th day of Adar, and help our troops to put them to death. Given at Shushan the Palace, by the authority of the Empress. (Signed) HAMAN.

(*The whole assembly applaud.*)

Mehuman. Hearken to me; we must go to work cautiously, for the enemy is very strong, forgetful of old enmities, of previous conflicts and threats against our empire. We must, as a party, ally ourselves with the Prince of Gog, give him our

moral support at least, and kind encouragement to invade the borders of Tubal, accursed race, and carrying fire and sword into the country, so terrify Tubal that he will retire.

Aradai. Well done. Let us start a subscription by way of loan to assist the Prince of Gog in his expenses in this war. I will give a hundred talents, a year's rent of my estates in Goshen.

Dalphon. If none of the money is spent in wine, I will lend fifty talents.

Arisai. I am not rich, but still I will give ten talents to this glorious war, and a thousand Damascus blades made in my town.

(*The assembly applaud.*)

Aridatha. I am called the greatest householder in Shushan; but I have so many claims on me that I cannot give more than two hundred talents.

Haman. A noble loan, worthy a Duke of Edom.

Aspatha. I am but a soldier, and all I have is but a paltry pension of the State, therefore I cannot give gold, but I can give curses, which may move the wrath of heaven, light fire in Tubal's entrails, humble his pride, and bring him on his knees.

(*They all applaud.*)

Parshandatha. I am likewise poor, by trade a scribbler; but I will dip my pen in gall for Gog. The world loves my letters, loves what I love, and hates what I hate. I am miraculous, for, contrary to Nature, I once gave birth to a baby—he is now a full-grown man—and made my reputation as a breeder of burning thoughts; therefore, my Lord Haman, command my services.

Adalia. Astarte has spun a three fold cord for me; to it I cling—Newsmongering, Manufacture and Philanthropy. As the sum of all, I will lend a hundred talents to Gog with my blessing and a curse for Tubal.

Zethar. I will now give you a rather long harangue on national law, to show you Gog is right and Tubal wrong; justice demands it. It is said that in the hills of Tubal some villagers fell out among themselves, and, seizing each other's goods, set fire to them. Some women were captured and outraged on both sides. Then came the troops of Tubal, and they kept up the slaughter. Some of those slaughtered were of Gog's religion, bowing to the same images in wood of a virgin, and boy god. Therefore the Prince of Gog, wanting the country, thinks he should punish them.

Adalia. This god is nearly mine, we both worship women and boys; therefore I think you are right.

Zethar. It is said that Mordecai, most cunning Jew, seeks to induce the Empress to meet the Prince of Gog in Conference to save his people that might die in war, and that the fear of Gog might make Tubal run to the wild unsettled parts.

Haman May Sheitan curse Mordecai. By this Conference he hopes to maintain his power; but my decree shall cut him off before it meets. Let us now choose the path of honour, and refuse the path of shame.

Carcas. Mordecai is not fit to live. One day I saw him at a liquor-bar, and he looked at me, and seemed to say, "Bad lawyer." Of all the abominable characters Mordecai is worst. And now, Lord Haman, you are a woodsman, fond of cutting down great trees; timber to you is cheap. Make you with all this timber a gallows fifty cubits high, and speak unto the Empress that Mordecai be hanged thereon.

(*They all applaud.*)

Haman. It shall be done. Come you to my field behind the house, and with an axe I will hew down some trees. (*The party all adjourn to the field.*) This willow, which will twist and turn, is Mordecai; it is a willow of Babylon. This papyrus, quite in the line of paper, is Shethar; this reed, ready to bend

double, most unstable, shaken with every wind, is Admatha. I hear that, magpie-like, he stole a spoon in Mordecai's house.

Carcas. Good; most villainous, he must hang like Mordecai.

Haman. I know him well, and think he is a thorn in Mordecai's side; should he remain there and breed a canker? He is a man that talks much about peace.

Biztha. Peace! peace! peace! nothing like peace for trade and carpets. Do you know, my Lord Haman, that the carpet in your house was made by me?

Haman. No, I did not before; but it is a good carpet. Give me an axe and I will fell the trees I've named, and may the names they bear in human flesh soon bite the dust. See you that oak; it is rather tough and I am tired. It is an oak of Bashan. I will fell it.

Harbona. Stop, my Lord Haman; stop, let the oak live; does it not serve you for shelter in this hot weather? Spare the old tree.

Biztha. Spare, Lord Haman.

Zethar. Pray spare the tree. Its acorns may feed pigs. Jews may not eat pigs, but pigs may eat Jews; that is the law of nations.

(*Haman puts down his axe.*)

Haman. Well, I am old and rather tired. See you my ten sons. None of you have so many. Am I not happy to have such strong stalwart sons, clever in every art; able to help themselves? Good men of business; one a sober man in drink, but in nothing else. One, the richest man in Shushan, and a Duke of Edom. But let us come into the house.

(*They all come back to the house.*)

Harbona. Bring me the dice, and let us cast our "pur" for a favourable day on which to ask the Empress to hang Mordecai. (*The dice are brought, and Harbona throws them.*) This is a bad day, the numbers are so low. Mordecai's star still rises.

Zethar. By the law of horoscope the life of Mordecai is one of great events. Give me a crystal ball, if you have one.

Haman. Here's one.

Zethar. Give all attention. (*In a solemn voice.*) As I fix my mind on Mordecai, and keep my eye intently gazing on the crystal in its white fleckled gleam, I see a star rise, bright, like a star of fire. It rises to the top and there burns brightly. And now I think of Haman, and soon another star rises towards the top. It burns fiercely; the two stars approach, the crystal trembles as the sparks of fire fall from the stars. But sudden they come together. I see one only, one is gone. Beware! beware, Lord Haman.

Haman. Your words disturb me.

Zethar. They may well, for this star shadows the path of a great man. But stop, I see a star spring from the top, and, like a firebrand thrown in a lake, suddenly dissolve its fire and floats a helpless cinder on the water.

Haman. And now, Abagtha, what do you think of this? You are an authority in things infernal.

Abagtha If you mean lucifers, I never touch them now. I made a very bad match, quite a mismatch, and have abandoned the whole trade.

Haman. This whole scene seems dreadful; give me some wine. (*Takes a cup of wine.*) Health to you all, confusion to the Jew. (*The company all bow reverentially.*)

[*Enter Messenger.*]

My Lord Haman, the Empress commands your presence at a banquet of wine. [*Exeunt.*

Scene IX.—*The bedchamber of Esther.*

Enter Esther *and Ladies.*

Esther. Sweet music does not soothe me as it used, or cure my heartache. What is the news?

First Lady. We hear that Haman is getting ready for the massacre of

all the troublesome men in your Empire, and that he has written to the Prince of Gog that you will let him attack Tubal.

Esther. That is all right; order must be maintained.

Second Lady. But it is also said that the decree is so worded, that the Jews may be included by it, and so may be subject to massacre and violence, and their women to violation.

Esther. This must be wrong, an idle report, for surely I never gave Lord Haman power to do such things.

First Lady. Yes, it is but a report, but still Shushan is much perplexed.

Esther. Get me to bed, I wish for sleep. [*Exeunt.*

SCENE X.—*The Empress's Banqueting House.*

Enter ESTHER *and* HAMAN.

(*Haman bows profoundly.*) May your Majesty live for ever. In obedience with your Majesty's Decree, I have issued orders for the putting to death of those that seek your Majesty's life.

Esther. I hope no Jews are to be killed.

Haman. No, your Majesty, only the turbulent of Tubal.

Esther. I hope no women and children of Tubal are to be harmed.

Haman. No your Majesty, only the armed men.

Esther. You relieve me. Take you a couch.

Haman. The weather is warm.

(*The attendants offer Haman wine and he sits down on the couch.*)

[*Exeunt.*

SCENE XI.—*The chief town of Tubal. A chamber of the Palace.*

Enter ROS, *an envoy from* GOG; TARSHISH, *an envoy from* ESTHER; *the Prime Minister of Tubal, and Envoys from the different parts of Scythia.*

Ros. The troubles in your country, Tubal, are such that my people will not bear, for have they not killed some of those who, like us, worship the Virgin and the boy, and if you do not give us guarantees, half of your fleet, and the right to occupy your country, we will take it all. Not because we love it, but to protect the lives of our religionists, worshipping the same images with us.

Tubal. What you ask is hard, more than my Lord will grant. Reforms, equal rights to all his subjects he will give; but not the right of foreign power to interfere. He would then cease to be a Prince. For ages we have fought and maintained great power, therefore we cannot yield to threats. What do you say, Tarshish?

Tarshish. Ros asks too much. Reform, as you promise, but do not yield your land. What say my Lords from Scythia.

First Scythian. My master made me this command, that I should not promise support to Tubal, but let the Prince of Gog do as he likes.

Second Scythian. My instructions are different. If you go too far, Ros, I must join Tubal.

Ros. (in a whisper) Is it with you a question of land.

Second Scythian. (in a whisper) Be quiet.

Ros. (bends forward and whispers) Shall we divide the land? you take two provinces, rich and fertile, and we take the rest.

Tarshish. What are you whispering about? Are you robbers, dividing spoils? Are you wolves, partitioning prey?

Ros. (smiling) We were only talking that if Tubal went to pieces, what would become of the pieces. Egypt is no use to you, Tubal, but it might be of great use to Esther.

Tubal. Enough of this; I heard wolves mentioned. Ye are all fierce wolves, therefore I bar my gates on you—begone.

Ros. This means war.

Tubal. Yes; war is better than hollow peace. [*Exeunt.*

SCENE XII.—*A battle field. The armies of Gog and those of Tubal fight.*

Enter the GENERALS *of Tubal and Gog.*

General Tubal. I fear the day is lost. My men have not eaten food for two days. But cut my way through I will; for I am hemmed in on three sides by the enemy.

(*He advances, but half of his men drop down exhausted. He is surrounded by the troops of Gog.*)

General of Gog. Brave man, you have fought well until you can no longer fight.

General of Tubal. Take you my sword; it is not you that have conquered us, it is famine. You are brave men, but our motto is death or victory; we are dying, eating our own flesh. [*Exeunt.*

SCENE XIII.—*The hills of Tubal.*

Enter GENERAL OF GOG *and* GENERAL OF TUBAL.

General of Gog. This fighting is wondrous hard; up to the hips in snow at every step. Ten thousand men killed near a narrow pass, a heap of rocks at best. These men of Tubal are tougher than I expected; they fight like devils. (*To his men*). Now, my brave fellows, in reward for all your toil and blood, long absence from your homes, you shall have the wealth of Tubal—the fine fruits, the wines, the oil, the middle-aged women, the young women, and the young girls. (*The troops cheer tremendously, and, encouraging each other, the men of Tubal at length give way*).

SCENE XIV.—*A village inhabited by the men of Tubal.*

Enter the troops of Gog.

Captain of Gog. A fine country this, lieutenant; at every step the soil seems either gardens of roses, or olives, grapes, and other fruits. Where the corn is not trampled down it is thick; well-watered plains tempt man and beast to linger. Ah, but what a smell; some man or beast unburied lies near. Some vile Tubal fiend lies near. There I see a man and horse together lie. See how the birds fly; first black crows, then buzzards and then vultures. See you the flies and hornets; that is an awful stench. Come on, don't linger; let the birds enjoy their feast.

Lieutenant. I see a waggon right in front, perhaps a quarter of a mile off.

Captain. My sight is bad, I see nothing. Those waggons often carry spoil. Send you five men on horseback to seize it, for it is going faster than we can walk. If we take one or two waggons with provisions I vote we make a halt.

Lieutenant. It shall be done. Shall I direct the men?

Captain. So do. Mind, one half the spoil belongs to me, one quarter to you, the rest the men divide.

(*The Lieutenant and five men pursue the waggon, which is driven by a decrepit old man.*)

Lieutenant. Villain! stop your waggon or you die.

(*The old man stops, and coming off the waggon falls on his knees.*

Old Man. Mercy, my lord; consider age. A grandfather, his three sons dying in war; almost a cripple, dependent on his daughter's labour. Three days ago my neighbours of another sect burnt my house, outraged and killed my poor old wife. Myself, three daughters, and their five children hid themselves among the bushes. When night came on, we found two old oxen, put them to this waggon, and, putting in my daughters and little ones, I hoped to save their lives. Kind, good lord, spare them, if you have a human heart

Lieutenant. Villainous rascal! It

was your sons who killed my brother. Men, take off that old fellow's head.

(*A soldier beheads him on his knees.*)

Lieutenant. Now, girls, don't run away; you shall all have husbands, big and little of you. First come, first served. The best shall be my prize. Young woman, come from that waggon.

(*The women and children descend, and are roughly treated.*)

Lieutenant. That's a boy. What's the good of boys? (*Cuts off his head.*) The youngest and the fairest is my prize. That fair young woman's mine. Mind, fellows, don't touch her. That other, a little less in size, is the Captain's. That plainer one, Corporal, is yours. Those four children are for you four fellows; bind them all, and put them in the waggon. Corporal, jump on and drive those beasts.

Young Woman. A greater beast will drive them.

Lieutenant. Corporal, you know the tongue of Tubal; what does she say?

Corporal. She says a greater beast will drive them, meaning me.

Lieutenant. Take you a pair of shears. Cut out her tongue

Corporal. I don't like the job.

Lieutenant. Give me your shears. Woman, how dare you insult a man of Gog? Open your mouth. There! (*Cuts out her tongue.*)

Enter CAPTAIN *and the rest of the troops.*

Captain. Good prize and sport, Lieutenant.

Lieutenant. Pretty well. There are many waggons in advance, I fancy, from the look of the road. Send on light horse and you will capture more.

[*Exit Lieutenant.*

Captain. This is the usage of war. After the battle comes the spoil and the women. Let us halt. Give me some strong drink. [*Halts.*

Captain, speaking in Tubal. Now, young woman, if you behave well you will be my wife as long as I stay here; but if you are not quiet, you shall feed the dogs and the vultures (*Young Woman cries.*)

Young Woman. Your humble handmaid.

(*Captain makes her sit down beside him.*)

Young Woman. Ah, villain—accursed villain—if such be your game, take that. There! feel my nails.

Captain. Scratch out my eyes like that! Here, feel my sword.

(*Stabs her.*)

Young Woman. Better to die than live dishonoured. (*Dies.*)

Enter LIEUTENANT, *with a troop of waggons crowded with captives.*

Lieutenant. See, what rich luck I have.

Captain. The one I got has brought me no comfort. See you these scratches on my face; that accursed woman gave me them, and here she is, just dead. I gave her the point of my sword. Now let us halt, have some drink; tie every leg and arm of those you take. To-night we will have a sacrifice and feast, but now is the time for noonday prayers. Come hither, priest, bring forth your shrine, and let us adore the wooden Mother and the holy boy. And now, my men, bring out your pocket gods, for we will not prosper in our war if we forget them. Almighty Gog, our gracious Prince, can sure defy the world; but still he is safer in having the sympathy in all he does of the great Haman and his ten noble sons. (*The troops encamp; the priests uncover the shrine; the men produce their gods from their pockets; they all worship.*) Now our religion's done. This wine is very good, much better than the coarse drink we are used to. (*Drinks.*) Now health to Gog and Haman.

[*Exeunt.*

SCENE XV. — *Thushan, an Apartment in Mordecai's House.*

Enter MORDECAI, SHETHAR, ADMATHA, MERES, *and* MEMUCAN.

Mordecai. By lightning came last night reflected on my chamber-wall a scene so dismal that my whole blood at once ran so cold, that even now, although I've eaten and drank warm food, I can hardly shake off my ague.

Shethar. By this you mean the news of this most cruel war, which Gog wages on Tubal and your most scattered race. Gog makes war on women, infants at the breast, as well as men. He seeks to destroy a nation, and leave not a scattered remnant Unless this war soon stops, I must clean my rusty sword, and fight to save the women and children.

Mordecai. It may come to that at last—that, old as I am, I may have to go with you.

Admatha. There will be an end of our neutrality, and all on a mere report.

Carshena. A false report, I'm sure. Gog makes war on men alone. Take heed our ways, or we will fall into an awful war, which will involve North Scythia, South Scythia, as well as Gog and us.

Mordecai. He who fears war is slain by it. He who fears it not, when right and duty call it, saves a nation's life; and if he does die, his sepulchre is always green. What say you all? Should we send a strong remonstrance to Gog concerning all the manner of this war? I wish that he should feel our power, and swift retire from all the land of Tubal he has devastated. Those who think with me will, when I have heard your words, hold up their hands.

Carshena. I am much afraid of Gog's conquests, but think that, the Empress having proclaimed her neutrality, we cannot rightly interfere.

Admatha. I will write a mild letter on the matter, but we cannot now interfere. If my Lord Mordecai says he must, then I resign my friendship with him.

Carshena. I must do so also.

Mordecai. Your decision, friends, grieves me much. Am I to see my people murdered and a whole nation ruined, and not be moved? At present I hesitate; but if before the month of Adar, when our great Council meet, something is not done to stop these massacres, I really must, if I go alone, fight in the cause of my poor nation, as well as of their kindred Tubal.

Shethar. Your sentiments are noble, quite my own.

Tarshish. From all I hear, Gog is suffering much from the war, almost worn out by it—poisoned by his own poison; caught in his own trap; drunk with his own wine. A bloody war is better than a hollow peace.

Carshena. My presence hinders you; may I take friendly leave?

Mordecai. If go you will, God bless you!

Admatha. I must go also.

Mordecai. Stay a little.

Admatha. I want to go.

Mordecai. I fear you, by your weak letters, have done us harm. Milk and water will not staunch blood. Give us some element of strength, some tight bandage on these national wounds. I think my friend Tarshish and I are of one mind.

Admatha. And now let me go. God speed you all. It is reported that you have seen a horse called Cyprus in Tubal's stable that you much covet, and that you wish to ride on it.

Mordecai. I wish the horse a present for the Empress. How came you to know this paltry matter of the horse? It seems but mean of you to mention it.

Admatha. Forthwith I go. God speed you all.

[*Exeunt Carshena and Admatha.*

Mordecai. My Lord Tarshish, take you his seat; we have formerly been friends, but now we will be like brothers, take you my hand. We are all now of one mind.

All. All agreed.

(*Enter Messenger.*)

The Empress, my Lord Mordecai, demands your presence, to meet Lord Haman. [*Exeunt.*

SCENE XVI.—*The House of Haman.*

Enter HAMAN, MEHUMAN, BIZTHA, HARBONA, BIGTHA, ABAGTHA, ADAHA, ZETHAR, CARCAS, PORATHA, *and* ARIDATHA.

Haman. Good news, my friends, the armies of Gog fight their way through the land of Tubal, and advance towards his capital. There, read the "Daily," which Mordecai calls the abomination which maketh desolate.

(*The assembly applaud.*)

Mehuman. I have read it all. Gog has acted nobly in this war; his troops have been like lions.

Zethar. Don't call them wild beasts. It is reported, and Mordecai will make much of it, that many thousand woman and children have been slain.

Carcas. Quite right, it is in our programme. How otherwise can Tubal be extirpated.

Biztha. I do not like bloodshed in general, but I think Tubal is so bad that if he will not go peaceably he should go by force. By the way, do you like caviare? for I lately had a present from Gog of his great delicacy; a hundred kegs. Will you have one?

Haman. Surely. Anything from Gog is nice; even what is fishy.

(*Smiles slyly.*)

Abagtha. A keg to spare for me?

Biztha. With much pleasure.

Carcas. In the "Daily" I read that Gog wishes to stir invasion on our northern border. Is not this a good diversion?

Haman. Something to frighten Mordecai and his vile friends, we need.

Poratha. Some good may come of this.

Adalia. I hope so. Shall we get up more meetings, dwell on the good qualities of Gog, his honourable way of managing the war, and treat as false reports the news of massacre, and rape of women and children?

Haman. We must deny all these reports.

Zethar. Some of us must lie hard.

Carcas. We all must lie, and curse Mordecai. [*Exeunt.*

SCENE XVII. *The Palace Banqueting House.*

Enter ESTHER, *the* EMPRESS, HAMAN *and* MORDECAI.

Esther. What shall be done to the man whom the Empress delighteth to honour?

Haman. (*in a whisper to himself*) To whom would the Empress delight to do honour more than to myself?

Haman. (*in a loud voice*) For the man whom the Empress delighteth to honour, let the royal apparel be brought, and the horse that the Empress rideth upon, and the crown imperial which is set upon her head, and let this apparel and horse be delivered to the hand of one of the most noble princes, that they may array the man withal, whom the Empress delighteth to honour, and bring him on horseback through the streets of the city, and proclaim before him, "Thus shall it be done to the man whom the Empress delighteth to honour."

Esther. Now, Haman, make haste and take the apparel and the horse as you have said, and do even so to Mordecai the Jew, that sitteth at the Empress's gate. Let nothing fail of all that you have spoken, and take your ten sons with you, and all your friends, that the honour may be complete.

Mordecai. May I ride the horse Cyprus? It has just arrived, a present from his Majesty of Tubal.

Esther. You may. [*Exeunt*

SCENE XVIII. *The House of Haman.*

Enter MORDECAI, ZERESH, *his Sons, and Friends.*

Haman. Cover my head, oh luckless day. I thought to bring honour to myself, but while I sought honour I have only found humiliation. Here let me sit in ashes and bewail my lot. I am a meteor which has flown from another world, and with but a momentary gleam of fiery light, lit the dark arc of heaven.

Zeresh. I do remember the saying of an old prophet, one Balaam, who said Amalek was the first of the nations, but in the end was to perish for ever.

Haman. I do remember it; also the saying of the Israelitish God, that he would "have war with Amalek from generation to generation." I fear there hangs over us a curse, for are we not all Agagites, descended from Agag, the king of the Amalekites?

Zethan "If Mordecai be of the seed of the Jews, before whom you have begun to fall, you shall not prevail against him, but shalt surely fall before him."

Bigtha. Take comfort, my lord Haman, I hear that Tubal has killed many Jews in the war, and still I hope the Empress's decree will be enforced against them.

Harbona. I trust it may.

Carcas They say five hundred thousand men, women, and children have perished in this war. (*They all applaud.*) Boys become men and fight, and women bear boys that become men and fight.

Zeresh. Tell me how it happened, Haman.

Haman. The Empress asked what should be done to the man whom she most delighted to honour, and I, thinking that she had great honour in store for myself, asked that I should wear the royal apparel and ride the royal horse. But I feel so ill, I would rather Harbona told it you than myself.

Harbona. Well, my Lord Haman, the apparel and the horse Cyprus, a present just arrived from Tubal, was, by the Empress's command, taken to the house of Mordecai, the Jew.

Zeresh. (*wringing her hands.*) Ah! Mordecai, accursed Mordecai!

Harbona. Most truly. Well, the apparel was put by Lord Haman on Mordecai with the Imperial crown, and Haman held his horse's head, and I assisted him to mount, and through the streets we led the horse, Haman holding his head. All of us were there on peril of our heads. We to the heart of the city went, hard by the great Town Hall and there the herald proclaimed, "Thus shall be done to the man whom the Empress delighteh to honour." Biztha cast aside his robe, and looked very small. The Newsmongers, taking up the popular cry, much applauded. One, called the "Standard" was foremost in the front; another, called the "Times," was very noisy; the "Daily" was completely floored, but this is our friend Adalia's property, and his affair. The city mob, hearing of our coming, and thinking to humble us more, went to a stall of images in plaster, where our busts were being sold, and struck off the lifeless heads in Mordecai's path.

Zeresh. A most bad omen. (*Tears her clothes and hair.*)

Harbona. It seems so, yet I will rally all our party for one more fight; but I am not sanguine of success. The Empress likes Mordecai too well, and sends him daily sweet roses.

Enter MESSENGER.

Messenger. My Lord Haman, the Empress demands your attendance at a banquet. [*Exeunt.*

SCENE XIX.—*The Palace of the Empress.*

Enter the EMPRESS *and* MORDECAI.

Esther. What will you, Mordecai, my faithful friend and counsellor?

Mordecai. Your late decree destroys the lives of all the Jews throughout your empire. May it be reversed?

Esther. Most surely, and if there stand up enemies against the Jews, let them take arms and kill them.

Enter HAMAN.

Mordecai. Here comes the adversary and the enemy of the Jews.

Enter HATACH, *the Chamberlain.*

Hatach. Behold the gallows, fifty cubits high, which Haman had prepared for Mordecai, who had spoken good for the Empress, standeth in the house of Haman.

Esther. Then hang Haman thereon. (*They cover Haman's face.*)

[*Exeunt Haman and Mordecai.*

SCENE XX.—*The House of Haman.*

Enter HAMAN, *in fetters,* ZERESH, *and the* CAPTAIN OF THE GUARD.

Haman. The Empress says I am to die on the gallows, which I made for Mordecai.

Zeresh. A fearful doom!

Captain of the Guard. Away, woman; those who seek to hang others, themselves often hang. Away, away, or I shall hang you.

(*Zeresh runs off, and conceals herself among the trees of the garden. Zeresh faints.*

Captain. Now, Haman, mount this ladder; I'll give you a long rope. You had your swing in life, and you shall have it in death. (*Haman mounts the ladder with the rope round his neck, one end is fastened to the beam, the ladder is kicked away, Haman hangs. The guards watch.*)

Zeresh. Oh, Haman! Haman! Is this your fate—is this a dream or sad reality? Oh, cruel Empress, thus to deprive me of the one I love most, not by the tranquil death of nature's rottenness and man's decay, but by the violent energy of hemp to pull by sudden start from healthy life and eloquence to swinging death. Yes, I see birds of prey hovering. Thank God I have ten sons who will avenge his death; in league with Prince of Gog, make insurrection in India, poison the Empress, and so will the Empire perish with her in vengeance for the murder of my Haman. Oh, Haman! Haman! my most loved name, the father of my darling sons, the chief of the Liberal party in our State, the friend and ally of most illustrious Gog.

Captain of the Guard. I say, men, who's that shouting among the bushes.

Soldier. That villainous woman, Zeresh, the wife of Haman. Shall I take off her head?

Captain. No; let her die of grief, that will punish her more than sudden death.

[*Exeunt Captain and Soldiers.*

SCENE XXI. *Mordecai's House.*

Enter MORDECAI. *Enter* MESSENGER.

Messenger. The chief citizens of Thushan, hearing of your deliverance, invite you and all your friends to banquet, and beg you will go in solemn procession.

Mordecai. When?

Messenger. To-day, my Lord.

Mordecai. We will come.

SCENE XXII. *The Town Hall of Shushan.*

Enter the CHIEF CITIZEN.

My Lord Mordecai and noble friends: We wish to give you all the welcome of citizens here to-day, and thank you for your services to our State. You have had much trial and have borne it with noble patience. The conspiracies of Haman have met their due reward, and we hope you will have yours.

Mordecai. Thanks for your kindness. A sense of your regard, together with our sense of duty, alone supported us. We wished for peace, but peace with honour. We did not wish to fight with Gog, unless honour demanded it. After much toil we have got from Gog as much as we could expect under the circumstances. We think he is not benefitted by the war so much as he expected. The world will have long peace, as he, the great disturber of it, is worn out with his success. We have made a treaty with Tubal which will protect our interests and his.

First Citizen. Now drink the health of Mordecai and of Tarshish, and may their enemies be confounded. (*The whole assembly drink their health and exeunt.*)

SCENE XXIII. *Mordecai's House.*

Enter MORDECAI *and friends.*

Mordecai. Now let us rest, since Haman we have hung.

Memucan. But, sad to say, what evil has been done, how millions have died through his conspiracy with Gog. Not merely men, but women, infants at the breast. Women with child ripped up. At least ten thousand Jews have been murdered.

Mordecai. My heart is sick to think of it, and still of the mischief that Haman's accursed decree will do to us. Still we must thank God for our lives, and make ready to defend them against the 14th day of Adar. You remember our great prince, Daniel, the mighty prophet? Well, he still lives, and, hearing of our troubles, is coming to see me.

Memucan. Most holy Daniel, model for us all, pure-minded, good in every way, wisest of men, most godlike.

Enter MESSENGER. (*To Mordecai.*)

Messenger. The chariot of my Lord Daniel is at the door.

Mordecai. Let him come in.

Enter DANIEL *and* ATTENDANTS.

Daniel. Most dear, beloved Mordecai, friend of my youth, I am commanded to come to you, and tell you alone of the great things which will come upon the people of Israel.

Mordecai. (*To attendants.*) Lead you my Lord Daniel into my best chamber, and give him every refreshment.

Enter MESSENGER.

Messenger. The Empress requires your presence.

[*Exeunt.*

ACT II.

SCENE I.—*Mordecai's house at night.*

Enter MORDECAI *and* DANIEL.

Mordecai. The dreadful day of Adar is passed, the day of deliverance from our enemies. Messengers inform me that we have killed five hundred men in Shushan, and the ten sons of Haman, the son of Hamedatha, the Agagite.

Daniel. Accursed race, children of hell! Many thousands will die in other towns.

Mordecai. The Empress has ordered that the ten sons of Haman do hang upon his gallows.

Daniel. Thank God for it. But for you all our nation would have been extirpated, including myself.

Mordecai. Quite true, quite true. But now some news has come that Gog almost possesses the capital of Tubal.

Daniel. Oh, vile, accursed Gog, scourge of nations, terrible as the locusts! The land of Tubal was an Eden, glowing in the summer sun, but now almost a sepulchre, half burnt, houses taken, women ravished, cities led captive.

Mordecai. Know you the holy prophet Ezekiel is coming? He sent a message by an angel to me, that he would come to-day from Chebar. Thank God once more I shall em-

HIS ENEMIES CONTRIBUTE TO THE TRIUMPH OF MORDECAI.

Adapted from Le Clerc

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"Thus shall it be done to the man whom the Empress delighteth to honor"

brace him, and hear from him much of the destiny of Gog.

Enter EZEKIEL *who embraces* DANIEL *and* MORDECAI.

Ezekiel. Ah, Daniel, much revered and loved, and Mordecai, my brother. Hear. "I am against thee, O Gog, the chief Prince of Meschech and Tubal. Gog has conquered part of Tubal and commands his forces."

Daniel. I had a dream last night, a wondrous dream, unfolding the coming history of our globe. Hear it Mordecai. I thought we built again Jerusalem and our holy temple, repaired the desolate places, and the country smiled sweet again. The hills were green, and there the cattle roamed, the young lambs sported on the tender grass, the vine and olive blossemed, and their rich juice filled every cup; but our old enemies, hearing of our prosperity, assembled in hosts to ruin it. Ammonites and Edomites were there. There was much fighting, a succession of great kings had ruled the East. First a ram, then a he-goat; then a beast, great and terrible; it had great iron teeth, and it had ten horns, and this beast waxed great, and it conquered and governed Judea, and I turned and looked if there was any to deliver, and I saw a star in the East, and, following its light, I came to Bethlehem. Remember "Bethlehem Ephrata, though thou be the least among the thousands of Israel, yet out of thee shall come a Saviour that shall rule my people Israel."

Ezekiel. Most true.

Mordecai. Most true.

Daniel. Well, this glorious star shone on a manger where there lay a child, and shed on it a glorious light. "This is the heir of David," said a young mother humbly clad, but looking truth and sweet simplicity. Right in the clouds a group of angels sang, "Peace on earth, goodwill towards man." "This is the Son of God," they cried.

Mordecai (weeping). Most holy vision, most sacred vision!

Daniel. I watched this boy in every path of youth lead a pure life as no man had done before. I saw the Spirit of the Lord come upon him in manhood and go forth a preacher, to warn mankind of judgment coming on Judah and the world; and as mankind required a sacrifice of the blood of beasts to teach them of a necessary atonement for sin, this man, the most perfect work of God, announced his mission to die for the sins of the world, and soon the wicked Jews put him to death. I saw him die upon a cross, buried in a sepulchre, and rise in divine majesty a king, ascend to heaven in more than human glory.

The wild beast besieged Jerusalem; our city and our Temple were destroyed, and every horror perpetrated upon our people, who in worse than Babylonish captivity were carried away.

Mordecai. Such was the will of God.

Daniel. The great beast prospered and overrun almost all the earth, we know. Its ten horns grew large, became ten kingdoms, for its body died. Out of one of the horns there sprang a little horn, which claimed an empire over the souls of men greater than did the old beast. It was a mixture of much force. It claimed divine authority and did combine the old idolatry with the new faith of the Son of God, which now began to shine. In truth, the Devil, hating the Son of God, sought to defile His kingdom and plant in it the seeds of Sodom; great was his success, and for many hundred years the Devil seemed to reign viceroy of God. Millions of saints perished by every cruel death. At length a prophet, bred in the mines of Scythia among the Allemanni, opposed the little horn, and, many

joining him, great wars ensued. The Word of God was read and in the hands of many. Some kings rebelled against the little horn and fought against him; some kings fought on his side. About this time some ships, sailing westward, found a new world, and planted the power of the little horn in it, uprooting the Pagan nations. Most wondrous world was that which was discovered, glorious, beautiful; nothing so grand had been found for ages. Well, trade and commerce flourished, and towns richer than Tyre or old Babylon sprung up, and Babel itself was quite forgotten, except that in the west a city on seven hills seemed to take its place. The ten horns that kingdoms did become had a wonderful history, too long to tell; they fought each other for power and general empire through many ages. At last one, like an eagle with two heads, got greater than the rest, and, conquering several, it assumed to represent the divided empire of the beast. About the time the little horn arose, a false prophet got mighty power in Arabia, and gradually conquered Asia Minor and much of Europe. He made Byzantium his capital. He subdued many nations, but at length was known as Tubal. He was for ages the scourge of God to punish wicked nations; but at last his power got weakened in comparison only, for other powers got stronger.

And as I thought I dimly understood the vision, I saw a field in which there ran a river, and on the other side of the river I saw a beautiful woman sitting on a throne; beside her was a shield, a trident in her hand, and a lion sat peaceful at her feet. The ships of all nations and many of her own passed before her, and gave her the title of the Queen of the Seas; and I saw in another part of the field a bear from the frozen North, savage beyond other beasts. I saw a turkey, a most goodly bird of beauteous feathers, harmless to all its neighbours, and seeking to be let alone; and I saw an eagle with two heads perch on a tree, and I saw a black eagle perch beside it, and I heard these animals talk.

Bear. I say, Turkey, I want to eat you; come to me.

Turkey. The river is between you and me, great Bear. I fear you not.

Eagle with Two Heads. If you, Bear, take the Turkey, you must give me part.

Bear. Surely I will. What do you say, Black Eagle?

Black Eagle. I do not want any of the flesh.

Lion. Animals, what are you talking about? Although I am on the other side of the river, yet, if you seize the Turkey and divide it, I must interfere.

The Woman. Be quiet, Lion. Do not roar.

Daniel. I looked, and soon the Bear crossed the river and seized the Turkey, which pecked out the Bear's eyes. I saw the Lion also swim the river and confront the Bear, which stopped, and all the animals assembled in homage to the king of beasts. The Lion spoke first.

Lion. You shall not devour the Turkey.

Bear. I am in possession and am famished.

Two-Headed Eagle. I am also hungry.

Black Eagle. Take you, Bear, two legs; and you, Two-Headed Eagle, take two wings.

Bear. I do agree.

Two-Headed Eagle. I do agree.

Turkey. I object.

Lion. This is unfair. I do not like it.

Lion (*in a whisper to Turkey*). Give me one of your eggs and I will protect your head and body. Your wings and legs will grow again.

Turkey (*in whisper*). I do agree.

Black Eagle (*to Turkey*). You really must consent.

Turkey. Well, if I must, I must.

[*The scene changed, and the Lion got greater. It had been before the strongest of the beasts; and now the Woman rode on it, holding the great shield and the poor bleeding Turkey.*]

Daniel. Just then an angel came and made me understand this fable in my dream. The woman was a mighty Queen and Empress that reigned. I looked across the river and saw an island full of men, horses, and chariots; a city as large as Babylon and Nineveh combined; a people great and free, most merciful and kind; wealthier than ever before, with a glorious history in the past and a glorious history to come; a deep, religious people, reading the word of God, and having a land covered with Temples. The Jews flourish here now, although once persecuted. At last a most wondrous Jew, learned in all the labyrinths of romance, speaking like an angel, approached the throne as you do, Mordecai, and governed in the name of a Queen and Empress. For many years he grew a lily amongst thorns. At last he triumphed, as you do. I saw his triumph and the confusion of his enemies, and thought what a close analogy there is between your life and his. You must build up the Temple, or urge your court to do it. He must build the Temple of his day, or prepare the way for it. You rode the horse Cyprus; he got the Isle of Chittim, or Cyprus, a present for his Queen. The wood of Cyprus will yet make pillars for the house of God.

Mordecai. Most wonderful vision! Most delightful vision!

Ezekiel. I am constrained to tell you about Gog the story of his future ruin.

Mordecai. We give most deep attention.

Ezekiel. Our third Temple rises the most magnificent that ever earth saw. Ten million Jews send their offerings to it. Two hundred million of the house of Ephraim, their companions, build it.

Mordecai. The promises to Abraham are then fulfilled; seed as the sand of the sea, as promised.

Daniel. The time of the fulness of the Gentiles is thus come.

Ezekiel. Solomon's Temple was built of silver and gold; but this Temple is built of precious stones, a hundred times more valuable. A perfect garden of delights our land becomes, every inch of soil is cultivated. The very air we breathe is peace. The lion and the lamb together feed, and hawks and turtles lay in the same nest. Butter and milk o'erflow the land. At every cottage sounds the gentle hum of bees. No wall or arms protect the towns; but trade and commerce flourish. Honour and justice stalk throughout the land, and almost every man walks uprightly. The deserts on our border, once rainless tracts, producing nothing, are now green meadows, changing to golden corn. From east and west, from north and south throughout the globe, the choicest offerings come to the great Temple, and every luxury that foreign climes produce, concentrates in our New Jerusalem; yet there exists an element of evil in our midst. Some serve the Devil secretly, while they in public praise God. Hence comes the necessity of judgment—the refiner's furnace with which the sons of Levi may become pure. And so the Devil gets leave to stir up the nations to a war against Jerusalem. During many ages Gog has grown a great Leviathan, absorbing many nations, but getting poorer. Tubal he half absorbs, and calls himself the Prince of Tubal. He forms a great confederacy of nations; Magog on the north, gradually rules Persia, Ethiopia and Libya; Gomer and all his bands the house of Togarmah on the north quarter. Twenty millions of men assemble,

seeking to enrich themselves with the spoils of our Holy Land. Their armies march, they quite cover the land with their horses and their chariots, as locusts do a field; never did the world see such a host. "The land is as the garden of Eden before them, behind them a desolate wilderness." And I heard a voice sound throughout all the land, "Prepare war, wake up the mighty men, let all the men of war draw near, let them come up. Beat your ploughshares into swords, and your pruning hooks into spears; let the weak say, "I am strong." And I beheld that this vast army marched to Jerusalem, and half of the city was taken and the women ravished. But the Holy Ones were constant at prayer in the Temple. Suddenly the Heaven opened and the Great King, the Son of God, descended with all His saints on the Mount of Olives, and there was a great earthquake, cleaving the Mount of Olives in the midst. O, what a rush of people to the mountains; there never was such an assembly, millions on foot of all ages. Then came a storm upon the host of Gog; fire and hailstones, every stone the weight of a talent. Of twenty million that came into the land not more than three million escaped alive. The false prophet and the great harlot, allied with Gog, were taken and cast into the lake of fire. There never was such an assemblage of birds and beasts of prey, to feed on bodies. They had assembled from thousands of miles, by God's command, to their great feast. The Lord's reign on earth has now begun, and the land is cleansed. The weapons and the chariots form the greatest store of trophies ever known, seven years' fuel for Israel. Half a million talents in gold and silver is gathered, and all the spoil which had been taken is recovered. And now the Lord proclaims His kingdom over all the earth, and the faithful ones of Israel go forth as judges to enforce the law with a rod of iron. All who are not obedient are broken to pieces. Humble merit now gets its full acknowledgment. Bloodthirsty tyrants cease to breathe. Every idol of wood or stone or metal is utterly abolished. But there is much bloodshed; every sort of plague has come on all nations; at least six out of every seven men are killed throughout the world, being in league with Gog and Satan against God. The women and the remnant giving glory and submitting to the judges, escape. And now the reign of Righteousness begins in all its bright tranquillity. Seven women lay hold on each godly man and say, "Our food and clothing we will use; be you our husband, to take away our reproach." Each thinks his great glory is in a multitudinous righteous seed. The unhealthy spots on earth become salubrious. Evil diseases disappear. Human life gets longer, and why?—the holy wisdom running through the earth makes man follow out the natural laws. He lives on grains and fruits, as you do, Daniel, and never the hot fermented juice of grapes imbibes, or puts the smoking herbs near his mouth. A hundred years is but a child's life, and many lives come near a thousand. This long span of life compasses a work which none of us now compass. Religion, Art, Science, useful industries, and every branch of useful knowledge flourish. The experience of a hundred years should give wisdom, and five hundred or a thousand a knowledge which to us might almost seem divine.

Daniel. Most good, most true. I have in my vision seen the days you speak of.

Mordecai. Go on, Ezekiel, with your revelation.

Ezekiel. Well, the race of Israel governs the world, and David's Son, the Son of God, sits on the throne hundreds and thousands of

years. The fruits of earth before have never ripened fully ; but a Sun of Righteousness comes forth and gives them such a lovely bloom, surpassing what we now can hope for. The liberty to do wrong is not given ; those who attempt it openly die instantly. No proclamation of law is needed ; the law is written in the heart of man.

Mordecai. Your words overcome me ; give me some water—air ! (*Mordecai faints. Attendants lift up Mordecai and exeunt.*)

SCENE II.—*Shushan, the Palace, Apartments of Esther the Empress.*

Enter ESTHER *and* MORDECAI.

Esther. Some years have passed since the foul conspirator Haman has been no more, and peaceful trade has through the empire run, and I have nothing more to wish for but to die and leave my empire with its large increase unto my good son. What wilt thou, Mordecai ?—to the half of the kingdom I will grant.

Mordecai. The city of my fathers and its Temple, the Holy Jerusalem, may I see it built and restored to its old prosperity ?

Esther. Yes, surely. It is in my mind to do it, for I had a dream from your God.

Mordecai. I am too old to hope to live to see it ; but will you make a decree ?

Esther. Yes, or my son Cyrus will do it. I will impress upon his mind his duty.

Mordecai. He is, I think, the Prince of which my friend Ezekiel speaks, who will take a great part in our worship, and be our governor. You are of Jewish origin, I know, of House of David. Your ensign is the Jewish Lion.

Esther. I know it is ; therefore I or my son will build the Temple and Jerusalem. (*Mordecai bows.*) *Exeunt.*

STUDIES FROM NATURE.

CHAPTER I.

THE PICTURE SALE—LIEUTENANT GREENER — THE JEW — LADY H—— MISTAKEN FOR A TRAMP —MRS. PRATTLE AND HER LUNATIC PATIENT—A WEALTHY PIKE.

IN the latter days of February an extensive collection of pictures was on view in the house of a lady, lately deceased, previously to being sold by auction. I paid three visits to the collection before the sale, and, sitting down, studied some of the more important works.

The late proprietrix had been a singular character, of penurious habits, affecting the French style in dress and manners. During years of Continental travel, she had collected about two hundred works of art, principally of the Italian and Dutch schools. To these she added about a score of English, and half-a-dozen Spanish pictures, and among them that by Richard Wilson, representing Sandsfoot Castle, described in "Tommy Try." There was keen competition for this picture. A little, one-legged naval man, with gold buttons, sitting on my left hand, seemed determined to have it at any price. He had a bright complexion and black piercing eyes, which occasionally shot daggers at a young Jew picture-dealer from London, whom I had overheard say that he was commissioned to bid as high as £80 for this picture. An elderly gentleman, who sat next me, had a very aristocratic appearance.

He turned out to be a Sir Ralph Termagant—a name by no means indicative of his real disposition. He was a friend of the collector of the pictures, had presented her with several of them, and had been often her companion or *commissionaire*. He was a man of the old school; extra polite, and pleasant to talk to. He had unfortunately mislaid his catalogue, and was glad to avail himself of mine.

The "Richard Wilson" long stood at £30, for the auctioneer hesitated, as he said, "to sacrifice so fine a work for so paltry a sum." These last words fired Lieutenant Greener, the naval officer I have mentioned.

"£35," said he.

"Guineas," said the Jew.

"£40," said the naval officer.

"Guineas," said the Jew.

"£45," said Sir Ralph.

On this the naval officer turned round and stared him full in the face, and, handing him a paper, he begged his pardon. Sir Ralph looked for his gold spectacles; they were nowhere to be found. They had been abstracted by some one of the eager lookers-on. The old man smiled, and said he would be eternally obliged if I could read it for him, and, suiting the action to the word, he bent his head on one side towards me. I nodded, took the paper, and read :—

"To Lieutenant Alfred Greener, R.N.

"Dear Brother,—I hear Lady H——'s sale of pictures will take place in a few days, and that 'Wilson's Old Castle' will be in it. You know how our dear parents valued this, and how distress alone could make our father part with it to Lady H——. It would be a very great comfort to dear mamma to see that picture once again. It would be new light to her old eyes. I have been lately successful with the coffee trade, and would gladly go the length of £50 to gratify her. If you like to go beyond this you can; but for £50 or £60 I think we ought to get the picture.

"Your affectionate Brother,

"George Greener."

Then followed a memorandum from the Lieutenant, addressed to Sir Ralph Termagant, and another apology.

Sir Ralph turned towards me, smiled, and nodded; and rising from his seat, he whispered something into the Lieutenant's ear. His face brightened, and he bid £50, shortly after which the hammer fell. The Lieutenant pulled out a roll of bank notes, and handing them to the auctioneer's clerk, he seized the picture greedily, and stamped over the floor in triumph, making a thundering rattle with his wooden leg. He turned round his head to give a friendly smile and nod to Sir Ralph, and a scornful scowl to the Jew, who was a little put out at loosing his commission on £80.

The next picture sold was a "Diana." by Carlo Dolci—a work of very high class, in splendid preservation. Size, 44 by 36in., and in carved gilt frame.

For this the Jew only paid £10, amid disapproving murmurs from several persons present, one broker saying it was just like "the Jew." A few lots later was a sketch of "Shylock," on which someone humourously remarked that "the Jew" was to be sold now, which so inspirited the buyers that "Shylock" was knocked down for nine guineas—six times as much as he was worth. He had evidently formed part of a large cartoon, for the head of the "Merchant of Venice" peeped out of one corner of the frame. At this juncture Sir Ralph left the room, and his seat was taken by an exceedingly sharp and dapper little Major, who pulled out his purse and began counting his money.

"I want to buy a pair of pictures, just to put on each side of my drawing-room mantelpiece," said he to me. "You've been here all day, I think. Can you tell me whether those two lots of architectural

subjects, by Pannini, have come on yet?"

I showed him my catalogue, and he said, "I see it will not be till the afternoon. I'll go out and come in again."

Two hours passed away, and Sir Ralph, the Major, and the Lieutenant were all standing together at the back of my chair.

The pictures were at last produced, and, after some competition, were carried off by the Major at fifteen guineas the pair, and he expressed his satisfaction. His manner and style were very consequential He professed a profound respect for the deceased lady, whose parties he had often attended. Just as the sale was breaking up, a little, middle-aged woman of my acquaintance came in.

"Ho—haw—sir; so you've seen the last of the sale? Lovely pictures; it is such a pity to see them dispersed. Heigh-ho! it's a heart-break to me, for I have seen them so often during her lifetime. She was a person of exquisite taste, and the finest sensibility, and loved to gather around her a galaxy of beauty and talent, and now all is dust. Heigh-ho! And these *chef d'œuvres* of art, collected, regardless of expense, from the choicest European galleries, are now being handled by vulgar brokers. Such is life.

"Lady H—— would have liked you. She was a very odd person. A little dark, gipsy-like face peeped out of a shabby bonnet, and a little scarecrow figure, crouched in a rusty black dress. Her costume often was worthy of a tramp. On one occasion—haw!—she called on a friend in Brunswick Square, and requested to see the lady of the house. The footman hesitated admitting her at all, and asked her name.

"'H——' was her reply, without naming her title. The footman took her down to the kitchen, saying, 'I don't know what such a dirty creature can want with Lady Susan; you are hardly fit for the kitchen. I don't know whether I am right in not showing you into the coalhole; but I'll tell the lady's-maid your name, old woman, and, if she likes to see old rags, she shall have the pleasure of seeing you.'"

"Lady H—— said nothing, and waited a full quarter of an hour, the laughing stock of the kitchen, until Gribble, the fashionable lady's-maid, sailed downstairs to tell her that Lady Susan would speak to her in the passage.

"Lady Susan came downstairs in a stately and dignified manner, and found Lady H—— sitting on one of the hall chairs.

"'Well, what have you to say to me?'

"'I say I hope you are quite recovered from your illness, Lady Susan?'

"Lady Susan started.

"'Lady H——, a thousand pardons for treating you in this way. Come up to the drawing-room. Gribble, tell people I'm not at home.'

"Lady H——, in a few words, told how she had been treated.

"'Fine feathers,' said she, 'I have often heard, make fine birds; but I never felt the force of it until now. By a slip of the tongue I omitted the word "Lady," and, seeing your servants' mistake, I determined to have a joke at their expense. But I thought that good feeling and decency would have prevented even a tramp from being treated as I was.'

"Lady Susan embraced her friend and shed tears.

"'I cannot tell you how grieved I am that you should have been so insulted. I shall reprimand all my servants, and dismiss the footman instantly.'

"'No,' said Lady H——. 'Scold him as much as you like, but do not dismiss him.'

"'Indeed, I must.'

"And that very day the footman received his month's wages and dismissal.

"Haw—haw—that was but right. Lady H—— was fond of telling this story to a room full of people, and I have twice been among them."

This loud talker was the widow of a Dr. Prattle, and being in straitened circumstances, owing to her late husband's extravagance, she was glad to take boarders. She put in an advertisement in the *Times* as follows :—

"The widow of a medical man, of high standing, offers a comfortable home to one or two single gentlemen in delicate health, requiring the most advanced science in nursing. A patient mentally afflicted would be taken on suitable terms.—Address A. B., Western Road, Brighton."

This advertisement was repeated in the *Times* until we were quite tired of seeing it.

One day I passed Mrs. Prattle's door, when I saw a cab opposite it, which was in the act of unloading a quantity of baggage. A man, about thirty-five, looking rather wild, was gesticulating with an umbrella to the driver, while his friend was calmly carrying a quantity of smaller packages from the cab to the house. Mrs. Prattle appeared on the doorstep.

"Have you got everything in, gentlemen? Haw! these cabmen are such extortioners. Haw!"

I heard no more, for the cab drove away.

About a month after this I called on Mrs. Prattle, who talked freely about her new boarder. He was a man (she said somewhat pompously) of great affluence, exquisite taste, and had once had a noble mind, but now ruined.

"Ah, sir, what a calamity is a mind diseased—haw-haw. There is nothing on earth so bad."

"I wonder you can manage him, Mrs. Prattle."

"I am well accustomed to lunatics," she replied, "having been brought up with one. I feel almost unhappy when I have none near me. But Mr. Wallensteen is not exactly a lunatic, he is only a little touched in the attic storey. A few of the upper rooms are to be let unfurnished, while the lower are a cage of unclean birds. It's sad to see it, but it's true. I am quite a prisoner now, and could not endure it, only £350 a year is such a handsome board that I must make some sacrifice to get it. I have iron nerves, sir, or else I could not manage him."

We were sitting in the drawing-room when I heard a tremendous stamping and howling overhead, which Mrs. Prattle said was Mr. Wallensteen.

"He sleeps a great part of the day and walks about at night, and I can't keep him in bed. I have a lock on the outside of his door which I usually fasten myself, and I have had his bedroom window well barred, so that he cannot escape. I am afraid to allow him either fire or candle, but he draws up the blind and reads by the light of the street lamp, assisted by that of a bull's eye lantern, hung opposite the ventilator in his door, through which I can watch his proceedings."

Just then I heard a voice shouting Mrs. Prattle, Mrs. Prattle; what are you doing downstairs? come up I beseech you."

So I had to wish her good morning.

On another occasion I called and saw the gentleman just leaving the room.

"Come back Mr. Wallensteen," said Mrs. Prattle; "my young friend is dying to see you."

But Mr. Wallensteen only bowed somewhat gracefully and retired. He was a thin fair man, of handsome features, high forehead and elegant demeanour.

"I had an awful night with him last week," said Mrs. Prattle. "He never went to bed at all, he would not go up to his room till day light. We got into a long argument on your favourite science, phrenology, which ended in a sort of quarrel. Mr. Wallensteen lay down on the sofa and I thought he was asleep; he was quite quiet for more than an hour, when he started up suddenly and began a furious attack on the Christian religion, for you know he is a great Voltairean. Well, he wouldn't hear my reply, but railed and rattled on till past one, when he lay down again until three o'clock, when he called for his second supper. Of course the servants were in bed, so I had to rouse one of them, for I couldn't leave Mr. Wallensteen, he was so excited. He took his supper, and then sat down to the *Quarterly Review*. I never knew any man read so many books. He spends at least £100 a year on them, and tears them up as soon as he has read them. He tore up four volumes of the *Art Journal*, the other day, merely because he did not like an article in that publication. I remonstrated with him, and he quoted the text, 'Is it not lawful for me to do what I will with mine own? Is thine eye evil because I am good?'"

"I'm sure you are not good, Mr. Wallensteen," I replied.

"Yes, I am; I was always considered a saint, and now I am a philanthropist."

"This shows the depth of his delusion, for a greater misanthrope does not exist. If he thought anything he has could benefit others, he would destroy it, and he thinks all that come in contact with him are cheating him, or have some other evil intention towards him. He is a trying man to any woman's temper. It is fortunate, indeed, that he is a bachelor. He was still restless, and kept walking up and down till four o'clock, when he went to the fire-place and seized hold of the poker."

"Now, Mrs. Prattle, I am going to brain you," and he burst out into a laugh.

"I wasn't sure whether he was serious or joking, and I went to take the poker from him. We struggled, I kept it on the ground with one hand, and with the other fumbled in my pocket."

"Now, Mr. Wallensteen, be quiet, I have got a pistol ready for you."

"He let the poker fall and I got a victory. I pulled out the pistol and showed it to him."

"This is capped all ready, therefore you must be quiet and behave like a gentleman."

"He sat down on the sofa and began reading a review, and I became so drowsy that I quite forgot where I was, and I went off to sleep in an arm chair. At last I awoke, and looking at my watch found it half-past six, and Mr. Wallensteen was still reading."

"Now, sir," said I, "you must go to bed, it's half-past six."

"No I won't," said he; "it's time to get up, I hear the cocks crowing."

"But you've never been down."

"Yes, I have. had a nice little snooze on the sofa."

"You must really go to bed quietly. Go to bed like a good sir, or I'll have to make you."

"Make me — no woman ever made me do anything, you—old viper."

"I order you to bed."

"I turned and stared him full in the face."

"I'm not going."

"You must."

"I won't. Is it not unreasonable for a man to go to bed in the day time?"

"You must do so." I pulled out my pistol. "If you don't go to bed I'll shoot you."

"Mr. Wallensteen slunk off to

bed quietly after this. I went up after him and barred the door. I looked through the ventilator and said, 'now if you make a noise I fire through the ventilator; lie down; lie down,' said I, in the same sort of tone in which I was in the habit of addressing my dog, and from that moment I could always manage Mr. Wallensteen, for whenever he made a noise at night, I went and threatened him through the ventilator."

His sister was here yesterday and told me his story. Their father left them each £30,000, but so tied up that neither could spend it. When he was about eighteen he went to travel on the Continent with a very profligate tutor, and got into all kinds of mischief. He was, however, much addicted to study, and acquired three or four languages. He wrote one or two novels which were published, but which no one has ever heard of. The opinions expressed in them were so wild and sceptical, that they were at once denounced by the reviews, and Mr. Wallensteen had the editions of a thousand copies each, burnt; by which he lost nearly £600. Poor man, he next took to picture buying, and spent nearly £2,000 on bad copies from the old masters. Then he took to horse racing and spent some hundred pounds at that, when a miserly fit seized him, and for a year he did not spend a hundred pounds. Then he took to book buying, and formed a fine library in the course of a couple of years. But he, on falling in love with a lady who did not care for books, suddenly got tired of them, and sold them off for about a tenth of what they cost. Her friends were anxious for her to marry him, for he was well connected, had £1,300 a year, and was under thirty. She at first accepted him in deference to them, but after a while she found that he was so utterly unprincipled, that she wrote to tell him that a union with him would be fatal to her happiness. Shortly after this disappointment he showed symptoms of insanity.

Several medical men recommended foreign travel; so with a faithful friend, a man of independent fortune, he travelled over most countries of Europe, and saw everything that was to be seen, in hopes of diverting his mind and recovering his spirits. For a long time his friend had great difficulty in restraining his extravagances, none of which "lent to virtue's side." At a fair at Bordeaux there was a large assemblage of county people on the banks of a stream. He went up to a group of young women who were listening to a fortune teller, and said—

"Now, young ladies, I'll make all your fortunes. Which of you can swim?"

Two of them said they could. So he brought them down to the bank of the stream to a part where the current was rapid and rather deep, and he pulled a napoleon out of his pocket. "The one who can find it at the bottom of this stream shall have it." And he threw it into a very deep hole. The two swimmers removed most of their garments, plunged in and groped about in vain for hours; diving for an instant, and then rising to the surface and landing to refresh themselves every ten minutes. At length a great crowd was collected, and among them several experienced divers. Mr. Wallensteen on this pulled out his purse.

"Now, gentleman, you shall have something worth having. There are forty napoleons," and he counted the money from one hand into another, replaced it in the purse, and threw it with all his might into the stream. Not less than a hundred of the bystanders took to the water. There was a fight and a

scrimmage among them, each trying to reach the bottom of the water for it. Mr. Wallensteen's friend described it as an awful scene. One of the divers received a stunning blow on the head and sank into a deep hole. He was not missed for a few minutes, when his dead body rose to the surface. After spending a long time in diving and dragging for the purse, the greedy ruffians gave it up. About two months after, an enormous pike was brought into the Bordeaux market, and purchased by the landlord of a hotel. On opening its stomach, the purse with the forty napoleons was found, to the jubilee of mine host. The pike had doubtless swallowed it, as it was thrown into the water.

At Paris Mr. Wallensteen and his friend passed every evening at the theatre, and Mr. Wallensteen fell in love with a very charming *danseuse*, for whom he hired a carriage, and would fain have driven about every day. This did not, however, suit Mademoiselle; she had other engagements she said, and duty should be attended to before pleasure. Mr. Wallensteen discovered that she had a lover in the theatre, and his countenance fell. After spending some hundred pounds in presents to her, contrary to the advice of his friend, he retired from his suit, and took small lodgings at Chantilly with a view of economising. There he and his friend quarrelled, and he determined to return to England, full of misanthropical ideas, and vowing to put the law in force against his true friend, whom he in delusion conceived had cheated him. He desired to travel alone, but this his friend would not agreed to, having made Wallensteen's sister a promise never to abandon him. His sister could not have him with her; so looking at the advertising columns of the *Times*, she noticed my advertisement.

Mrs. Prattle did not long retain her boarder, for his ravings became so numerous and violent, that his Brighton medical attendant wrote to his friend recommending that he should be placed in a regular private asylum. But the immediate occasion for his removal was a report which reached the ears of his sister, that Mrs. Prattle meditated frightening him into marrying her. One of the servants said that she overheard her bawling that he ought to marry her, on economic grounds at least, so as to save his £350 a year. She expressed most dutiful love towards him, and a most praiseworthy regard for his interests; but in this she was not altogether unmindful of her own, for her solicitor had made private enquiries as to the nature of his property, and had a settlement drawn up ready for signature. His sister had always secretly or openly opposed his projects of marriage, for she reckoned on his dying a bachelor, and on her or her children succeeding to his £30,000. This last, Mrs. Prattle avowed to me, and called her a selfish woman of the world, who had not her brother's true interests at heart, but who encouraged the idea of his being a lunatic, in order that she might get him made a ward in Chancery, and secure effectually the larger part of the interest, and eventually the entire capital of his estate. According to Mrs. Prattle, the sister was a true Athaliah, a horrible woman, while she herself, was but a high-spirited lamb.

Chapter II.

TUTORS—PHRENOLOGY FROM THE ANTHROPOLOGICAL REVIEW—PHRENOLOGY IN SCHOOLS—A BENEVOLENT BOY—A PROUD AND VAIN LIAR—A THIEF—COLOUR BLINDNESS — PHRENOLOGICAL MARRIAGES — THE CALCULATOR — DR. SOUTHWOOD SMITH, RICHARD COB-

DEN, SIR W. ELLIS, ROBERT CHAMBERS, HORACE MAN, ARCHBISHOP WHATELY, AND DR. THOMAS CHALMERS ON PHRENOLOGY.

At seventeen years of age, I was placed under the care of two tutors. The first was a practical, plodding, every-day reader, excellent at preparing for examinations, and whose pupils had won golden honours from examiners. The second was a man of great erudition in ancient history and philology, who spared no time or pains to search out original authorities or discover the roots of words. This man's instructions were greatly preferred by me to those of the other. He had an original, if not a scientific, mind, and a truly vast acquaintance with literature, while wanting that method and perfect knowledge of subjects which the learned expect in a finished scholar. Still, his high principle, prodigious memory, indefatigable perseverance, indomitable courage and warm-heartedness, made him, in many respects to me, a unique man.

I cannot say I profited much by his instructions in philology ; but I got a great stimulus to pursue the scientific study of human character, of which he might truly be said to have had a profound knowledge. I did not go ostensibly to learn this ; but gradually my lessons took this tendency, and I was better pleased than by knowing the equivalents of Latin roots in Greek and Hebrew, to show which was one of the hobbys of my learned master. He set a high value on the science of phrenology, and placed in my way many books on it, as well as "casts" of the heads of eminent men, and the skulls of a few noted murderers and other notorious individuals. This soon became more than an amusement ; it became an engrossing study. When my classical studies were over, I delighted to linger in his library, and ply him with questions about the many notabilities he had met.

At that time I attended a public class, where I encountered a great variety of boys ; this afforded me an opportunity of studying character, which I now desired to do practically. The class-master was much interested in phrenology, and brought before me those boys whose characters he knew were peculiar.

By this time I had acquired a general knowledge of the outlines of phrenology, both theoretical and practical, and had carefully studied about twenty human heads and as many casts and skulls. My method of examination was this : I ascertained the position and size of the organs of Firmness and Destructiveness amongst the selfish propensities, and observed the proportionate size of the surrounding organs. I next noticed those of the moral sentiments, situated on the top part of the head, beginning with Veneration. The other classes of faculties were sought for in like manner. I took nothing for granted on the authority of George Combe, Gall, or Spurzheim ; I verified everything by personal examination during a course of about ten years, and after having measured and compared about 1,000 heads, I came to the same conclusions in the main as Combe, Fowler, and others—that phrenology is perhaps the most perfect of the non-mathematical or inexact sciences, and that there is less difficulty in its practice than in that of medicine, engineering, chemistry, or in the principles, or rather theories, commonly received in botany or zoology, while as regards importance none equal it. But, like many a great truth, it is but little received. The greater the truth, the greater the opposition it meets with, unless advocated by a well-nigh superhuman power. In an essay, which I wrote at Dr. Hunt's request for the *Anthropological Review* (vol. vi. p. 152) I go on to say, "It is a very profitable enquiry how far pschychological phrenology is true. It is a more

favourite subject with the opponents of the science than practical phrenology, who are prone to ask, How can the mind of man—a unity—be divisible into a variety of faculties? A hypothesis no more unreasonable than that which accepts the body as a unity consisting of many members. We have yet to see an able essay on this subject, in which the unity and diversity of man's mind is established: its author will be indebted to the thanks of posterity; for sooner or later the world in general will become as awake to the importance of knowing the mainsprings of mental as of material mechanism. That the study of phrenology will eventually have much to do with this, we have no doubt. A writer in *Maunder's Scientific and Literary Treasury* says, 'Were phrenology an established science, and were it possible to draw unerring deductions from the data it lays down, its discovery would be the greatest step ever made in mental philosophy, and its application the most beneficial ever used for the amelioration of the human race. By disclosing individual character, it would give security to social intercourse, and make communication prompt and easy. It would disclose real merit, and expose unworthiness. The truly wise and good would, at last, attain their proper elevation in society, while the ignorant and vicious would be obliged to hide their diminished heads.'" (p. 576).

The intelligent author of these remarks is willing to give more importance to phrenology than its warmest advocates; he argues as if the study of it will change the nature of man; a very improbable result. It is at best an agent, not a prime mover. Mankind have, unfortunately for themselves, always bitterly opposed the progress of truth; it has only triumphed by virtue of its immortality. The miserable men who opposed phrenology, with sophisms or lies, are now forgotten, but the science grows—stunted perhaps, but still young; cultivated by all classes in every town in Europe and of the United States.

Yes, the current of truth may be retarded, but it cannot be stemmed. Crushed by the force of despotic opinion, it may for a time retire, till the pressure relaxes, worn out by its own efforts. Democracy, banished from the England of the Stuarts, found a fertile field; and phrenology, an exile from the thresholds of the schools, found a refuge and a home in America, and their growth has been such as we might expect on a virgin soil.

Professor Bain, in his elaborate work on the study of character, has got into the same position with Combe as Festus did with St. Paul; he is almost persuaded to accept a great truth, but lacks the courage or the candour to avow a hearty acceptance of it. He believes, but he trembles. Dr. Carpenter, again, after laboured attempts to refute phrenology, ends by localising distinct mental phenomena in the brain.

He may be right, but the truth of phrenology does not necessarily depend on such a demonstration; it is based on the physiognomy of the skull, interpreted by the thoughts and actions of men. Statistics from these coincident points of vision, when applied in a sufficient number of cases, must establish the truth or falsity of the science. When man's skull is transparent, we may hope to read on his palpitating brain, his past, present, and future. It is but little we can ascertain when we unseal in the dissecting room, the door of this,—now the sepulchre of thought—rely on this and you deserve the lash of the satirist—

"Was ever such an ass as that,
Who hoped, by slicing mutton fat,
And pulling candlewicks to pieces,
To tell why light should spring from greases?

Yes, one; that still more precious fool,
Who, in the anatomic school,
Expected with dissecting knife
To learn from death the laws of life."
—*Beranger.*

It has been frequently urged against the truth of phrenology that it has been but little accepted by the world in general, and entirely ignored by corporations and learned societies. These bodies are slow to accept new truths, and generally oppose the advance guard of thought. "In universities and colleges," says Lord Bacon, "men's studies are almost entirely confined to certain authors, from which, if any dissenteth or propoundeth matter of regardution, it is enough to make him be thought a person turbulent." Of this we have many examples. Columbus, before the doctors of Salamanca, was accused of heresy, and pointed at with the finger of scorn for declaring his belief in the rotundity of the earth. Harvey, the discoverer of the circulation of the blood, at first received contempt at the hands of the College of Physicians, and of his medical brethren, who even refused to meet him in consultation. The astronomical discoveries of Newton were received with equal disfavour. Lady Mary Wortley Montague, the introducer of inoculation, was held up to public odium. Jenner, the discover of vaccination, a process now in general use, was refused a license to practise by the College of Physicians, treated with ridicule and contempt, and the theologians hurled their anathemas against him, Errhman, of Frankfort, alleging that vaccination was a real antichrist. Are not these scars the "mark of the beast?"—they were taken from the cow.

Superstition in one age, materialism in another, oppose the advance of moral science. Are they not divers forms of the same principle? Materialism in these days has assumed its grossest form—that of snobbism—which now aims at universal empire. Intelligence is crushed by brute force; skilled labour by manufacture; genius is bought or enslaved by wealth; and material is more valued than art, except that of adulteration. Wealth and honour are showered upon the lucky inventor who can profitably adulterate some article in daily use; who can entwine wool and cotton, and yet cry *de laine;* who can substitute strychnine for hops in beer; silica for soda in soap; sloes for the juice of grapes; and, rivalling the giant whom Jack slew, grinds the bones of Englishmen to make their bread.*

Thus the truth of our science has even greater enemies to contend with than the imprecations of snobs or learned corporations, as it fights with a monster whose diploma may be summed up in one small word—*sham.*

"But a day will dawn which will see the garotte placed on the throat of this murderer of the noble and intelligent of the age. Then will crushed nature return to the freedom of her youth. When such finds a dishonoured grave, and is not represented in Parliament, we may then in honesty gaze on our physiognomy in a glass, and forget what manner of men we were; for we fear until this consummation, physiognomy, as opposed to counterfeit, by teaching us to know our neighbours, and, above all, to know ourselves, will remain unpopular."

The above quotation but expresses my sentiments at the time of which I have been speaking; and many of the arguments here used were made the most of against the shallow scoffers

* After the Crimean war, large cargoes of bones were brought from the Crimea. They were of a variety of animals—horses, cattle, sheep, and even men. These were mostly ground for agricultural purposes; but the whiter and better specimens were (said to be) selected for the flour mill. This gives a reality to Fee-faa-foo-fum, the declaration of the giant (War?) unknown before.

of this noble science, which I then encountered. My earnestness and zeal were rewarded, truth had many triumphs, and victory on my part was of very secondary importance. As I said before, very early in my study of the science, I boldly entered the field as a practical examiner. I felt that the main battle of phrenology was to be fought here, and that it was the only sure method of learning the principles of the science. I had many a talk with my class master on the point; for years he had been a sturdy opponent of it, but its practical demonstration to himself and others, convinced him against his will, as it were, that it was a great truth. Among the boys brought before me was a silent youth, remarkably plain in features and uncouth in attire. The instant I put my hand on his head I noticed that he had extraordinary benevolence, on which there was a general shout from his schoolfellows,

"That's true!" "You are quite right!" "That's a fact!"

This especially startled the boys, as I was a total stranger to their benevolent schoolfellow, who hung down his head in modest astonishment at his propensity being known. Instances of his kindliness were related.

The gardener of a neighbour fell from a ladder, breaking both legs, by which he was disabled for life, rendering himself, his wife and eight children a burden to the parish. His employer was not rich, and could only afford to give him £5, so when this little sum was spent he was likely to go to the workhouse. Frank Haines—for that was the name of the benevolent boy—seeing in the *Times* how more than a hundred pounds had been raised to meet a similar case of distress, thought he might do likewise. He had an interview with the editor of one of the local papers, whom he interested in the case, and wrote a letter in a natural, boyish manner, stating how the poor man was situated, and said the editor had offered to take charge of subscriptions for his benefit. He exerted himself in the class, and in his school, and raised £5 in that way, and what with it and the subscriptions collected through the agency of the newspaper, £53 were got together for the poor man, which enabled his wife to commence business as a laundress. This little instance is instructive, not merely as showing the truth of phrenology, but as proving what a noble-hearted boy can do. As a contrast to him may be mentioned that of his cousin and schoolfellow, Tom Hall, whose character I described as being mainly composed of pride and vanity, and inclined to be sullen and morose when not permitted to "lord it" over his companions. All the boys, but the *hero* himself, acknowledged this to be exactly true. Tom Hall declared his total disbelief in phrenology. Among the youngest was Charley Morley, a bright-eyed fellow. He was described as having a passionate desire to possess property, and to be mean and sly to a great degree. As he was one of the youngest, his character was not so generally known, but his brother, admitted the truth of my remarks, and said it was difficult to keep money, postage-stamps, sealing wax, and other little articles from him, his kleptomania being so strong. He had been turned away from one school for it, although not more than nine years old. I afterwards heard that, on growing to man's estate, he had been placed as junior partner in a bank, with a capital of £20,000, a sum which fell to him on the deaths of his father and brother, but that his numerous thefts caused the other partners to get rid of him at great sacrifice, on which he went to the United States and ended his days as a felon.

George Dyson, another boy of the class, was the heir to a considerable property, and was of a remarkably old and influential family. He was

very conceited and mean, and disinclined to active exertion. His phrenological developements were, large self-esteem, acquisitiveness, and cautiousness; a moderate intellectual region, and a heavy lympathetic temperament that would take the hottest furnace of affliction to rouse or roast. Dyson's cousin said I had exactly described him, but Dyson turned up his nose at phrenology; it was naturally *retroussé*.

In these little examinations I never shrunk from avowing what I believed to be true; never minding whether persons were angry or pleased; but at the same time avoiding harshness of language. I never found I made any enemies; on the contrary, many friends by the science which afforded me a wonderful pasport into the spmpathies of those I met, for understanding them, I could adapt myself to their tastes and make an allowance for their prejudices which I could not do before. There is no man that has not some good in him; this phrenology enables us to discover, better than any system short of actual long-continued study of the individual. It is of most use to sharp-sighted and careful observers, who before they acquire this science acknowlege that they are like mechanics minus their rules and compasses.

Phrenology appears equally suitable to the female mind; the ladies I met were even more interested in it than the gentlemen. They are more open to receive new truths in science, art, and theology; and more observing of physiognomical signs than men. Men follow what they have learnt by rule, often with blind fidelity, but women, having had less technical instruction, are more open to receive fresh impressions, but this is only to a limited extent. The man of genius who has new ideas to give to the world, the prophet or the apostle will find his first sympathisers and followers in superior women.

My second master had a well developed head, both in the moral and intellectual regions; but I noticed a singular depression near the centre of the eyebrows.

"You are very destitute of the organs of colour, Sir," said I.

"I am sure I ought to have none," he replied; "as a boy all colours but black and white were alike to me; red and yellow, purple, blue and green were the same. I can now distinguish between blue and red in a strong light, but not between the others, although my sight is perfect as regards size and form."

On mentioning this to my other master he said that he also was nearly colour blind, and there was in him the same depression in the region of the organ of colour, although he was one of the most observant of men in other respects I have met. He continually urged that every person possessed all the phrenological organs, but that they differed in degree, and that this degree, with temperament accounted for every diversity of human character. One of the greatest practical uses of phrenology, according to him, was in the selection of partners for life; for here was a sure guide, much more sagacious than passion, which so often precipitates calamitous unions, to break which is perhaps on the highest moral grounds unadvisable.

My master would never engage a servant without having her head examined. He said that phrenological examination was a better guide than a character. He had practised as a professional phrenologist himself, and told several instances of its benefit in preventing or promoting matrimonial alliances.

One young lady was wooed by a wealthy merchant, whose captivating manners and handsome appearance made her favourably inclined to him. She was a convert to

phrenology, and before giving him a definite answer she referred him to my master, who described his organization, though highly intellectual, as of a low moral type. But he was gifted with such powers of simulation that he could counterfeit, when required, all the moral virtues. On this the young lady declined the engagement. Her sister, not believing in phrenology, married the merchant, he having proposed for her soon after the phrenological examination. Six weeks after the marriage she wrote to her mother, complaining of her first whipping. During her twenty-five years of married life she bitterly lamented the many vices of her husband, who dissipated all his property, and, at length, eloped with another woman, and she was then glad to take up her abode with her sister, who long ere that, thanks to phrenology, had married an excellent man. They were both believers in the science. He had selected her almost at first sight, on the ground of her high moral and intellectual development, and she made her acceptance of him dependent upon an examination of his head.

My master was in the habit of holding classes for practical instruction in phrenology. Ladies freely came and had their heads examined, but generally only in presence of their own sex, and the same rule was followed with regard to men. This young lady was a member of the class, and one day stayed over time, until the gentlemen's class commenced, and, not wishing to be too conspicuous, she retired into an adjoining room, a little to the surprise of the master.

A somewhat plain, but intellectual, man came forward for a delineation of character. His reasoning powers were described as immense, and his moral and domestic organs greatly above the average. He smiled, and was observed to turn his head round to the room in which the young lady was sitting. A glance of mutual intelligence passed between them, and he joined her. When the class was over, she introduced him to the phrenologist as her future husband, the first intimation he received that he was accepted. He was a distinguished scholar and mathematician, and in every other respect an admirable man. They were married and were singularly happy, until excess of study and zeal in the discharge of his duties as a clergyman broke down a delicate constitution. His wife nursed him during ten years with patient assiduity, which eventually destroyed her health also. She was one of the most amiable women I ever saw. She had very good abilities, and was a persevering student, so that during her girlhood she acquired a very fair knowledge of three modern languages, and considerable skill in painting and music. On marrying a distinguished scholar, she felt anxious to sympathise with him in his classical, oriental, and mathematical studies, so she was content to go to school again, until she read the Old and New Testaments in their original languages, could write the Hebrew and Arabic characters beautifully, and was able to teach her sons Euclid and the Latin grammar. With all these accomplishments, a meek, amiable spirit ruled. She was content to learn from anybody; and it was only when conversed with on intellectual subjects that it was perceived how well she was informed. Had she been of an ambitious temper, she would have commanded more admiration from the world, but she would have been less perfect as a woman.

This interesting couple were never tired of praising phrenology, for having brought them together, and from both husband and wife I heard this story. He was long an eminent professor and the head of a college.

I was in the habit of sitting on a terrace which commanded a pleasant view of the sea, and was one day addressed by an old gentleman, who asked the name of a fish he had in his hand. It turned out to be the straight-nosed pipe fish (*Syngnathus ophidion*), which he thought a very rare and curious species. I told him what I knew of its habits, and he expressed great interest.

"What wonders there are in the sea! My thoughts however are not much fixed on it, but upon remote antiquity. I am engaged in investigating the origin of weights and measures, and their connection with national origin and filiations." And he proceeded to make some calculations on the margin of a *Times* newspaper he held in his hand.

"One of the great objects of my life," said he, "has been to discover a true standard of measurement. The French think much of the *mètre*, which you know is a part of a degree of the equator."

And after a minute's thought he launched into a learned disquisition, which interested me from its recondite profundity. He had evidently extraordinary learning as well as great intellectual power, for almost every sentence contained some interesting fact or first principle.

A few days after I met him again; he came towards me and we had another long conversation. His frankness surprised me. He was in his seventy-fifth year, and described the leading events of his long life. He was born in Caithness, and after some preliminary education at the Edinburgh University he removed to Cambridge, where he distinguished himself in mathematics.

William Pitt gave him a situation at the Admiralty, where he devised a plan for arranging the numerous letters received by that important department of the public service, by which they could be answered the same day they were received, thus assisting greatly in the economy of time and labour. His admistrative capacity and knowledge of statistics attracted the notice of Government, and he was appointed to the important situation of actuary for calculating Government annuities in connection with the National Debt Office. Although his duties were arduous, he found a good deal of time for private study. He did not require more than four hours sleep.

His literary labours were great, but of a somewhat unattractive kind. He brought out a "Blue Book" every year, almost entirely composed of figures.

He was evidently one of the first actuaries in England, and for many years was president of their society. He thought but little of the Statistical Society, though urged to take a part in its formation.

"What!" said he, "is it not preposterous to put tables of imports of figs, prunes and rice, in the same transactions with those facts which may help us to obtain a knowledge of the grandest natural laws?" And so he declined any connection with the Society. About a dozen years before the time he was speaking to me, feeling advancing age, he retired from the service, and wishing to try his native Scotch air, he settled in Aberdeen, taking a nice villa on the outskirts of the town, where he spent much of his time in gardening, and in watching the habits of birds and insects.

"It was too late in the day," said he, "for me to become a practical naturalist. However, I could amuse myself, and I got a new lease of life—or rather another annuity.

"My garden was famous for its strawberries; my daughter gathered one which turned the scale against seven shillings. But I did not much like Scotch society, although I am Scotch myself. Their gnat strain-

ing and camel swallowing quite disgusted me; Scotch Sabbatarianism is particularly offensive. I engaged a cook who brought a very high character, but who was quite put out upon being ordered to wash some dishes on Sunday. My wife spoke to her on the subject, but she was inexorable. The matter was so urgent that I thought I would see what I could do, so I called her into my study."

"Well, Campbell, are you going to wash those dishes or not?"

"Indeed, Sir, I canna do it. It's against my honour and my conscience too."

"But you know Colonel and Lady Reynolds are coming here to supper."

"I canna sin to please you or any one else. What does our Lord say about the Sabbath, Sir."

"Well," said the old gentleman, "He went into the corn fields and His disciples plucked the ears of corn and did eat on the Sabbath day, and when the Pharisees—like you—reproved them, He justified them, and in another place said it was lawful to do well upon the Sabbath day. And now, my good woman, is not keeping the dishes clean doing well?"

"No, Sir, it's against my conscience. It's keeping clean the outside of the cup and platter."

"Well, but you have our Lord's authority for doing your duty on the Sabbath day. He broke the Sabbath when necessity required it."

"Then He was very wrong, He should have keepit the Sabbath, Sir. I canna get over that."

My old informant told me that the other servants being out, his wife had to wash the dishes that afternoon for supper. And the next day Mrs. Campbell departed, with a large box full of property, stolen from the house.

Feeling tired of his life in Scotland, he took a handsome villa in the outskirts of London, and devoted himself in earnest to his books, spending the summers at fashionable watering places. He spoke on the subject of phrenology, of the truth of which he had seen many instances. As a total stranger he had called on Deville, of the Strand, the well known phrenologist, and demanded to know what profession he was of.

"You are a musical composer," said Deville.

"You are right, Sir, I am a composer, but not one by profession. Guess again."

"You are a great geometrician and calculator."

"You are right."

Before I heard this I had given much the same estimate of his musical talents, and had described his temper and peculiarities with what he considered wonderful accuracy, and was induced at his request to call on him, to be introduced to his wife who took some interest in phrenology, and who was anxious to hear of practical works on it. She proved an amiable person of great intelligence.

My old friend was a distinguished chronologist, and I had many conversations with him on the different value of the various systems for ascertaining the age of the world. He entered into this subject with great earnestness, and took great pains to explain his theories He held the ages of the patriarchs mentioned in Genesis to be representative not of individuals, but of groups of generations, and in the most elaborate manner attempted to show how generations had continued at 33 years all along.

He had no fancy for teetotalism, for, notwithstanding his age, he would take a bottle of port wine daily, and sometimes two; which had, however, an exhilarating rather than a narcotic effect. His restlessness was extraordinary. He could hardly keep his seat five minutes together, but liked to walk round the

table; for, being a great geometrician, he loved to describe the circle, his legs forming no contemptible substitute for compasses, although they were a little unsteady.

One of the most interesting events of his early life was an interview with Napoleon First, who asking the English Government to send him a man capable of giving advice in constructing long annuities and life interest tables, they sent him the English Actuary.

I called by appointment on my old friend to see several works and "Blue Books," in which he had a hand, and was taking my leave, when an old gentleman entered, who was introduced to me as Dr. Southwood Smith, F.R.S. He had a truly vast intellectual development.

"This young gentleman," said my old Scotch friend, "would be very much interested in your researches in physiology, for he is a great phrenologist, and is fond of natural history. He has enabled me to ascertain what the Jewish Rabbis mean, by adopting pigeons' eggs as the unit of their scale of measurement, having allowed me to take the average of a dozen of them in his collection; and he is quite capable of measuring your head, Dr. Southwood," said he laughing. "He has already rated me at far too high a level."

"I hope, young man, you don't spend much of your time in studying that exploded and rubbishing system phrenology," said Dr. Smith.

"I presume, Sir," replied I, "you have investigated it?"

"Of course I have. I was an intimate friend of George Combe,—a very worthy man in his way, although troubled with softening of the brain on the subject of phrenology."

"I should much like to hear your objections to the Science, Dr. Smith."

"In the first place," said he, "I do not see the good of it. What is the object of knowing the natural endowments of a man, when it is with education and circumstances that we have alone to do in practical life? Presuming phrenology to be true, such knowledge would be rather a hindrance than a help, as tending to make man dissatisfied with his condition, and unduly elevated or depressed. For my part, I see no good in proving or disproving phrenology."

My old Scotch friend said:

"But, Doctor, although I am no metaphysician, and don't wish to be, still I must admit, and you with me, that there are inherent qualities in man, and that individuals differ in kind, as well as in degree."

On which Dr. Smith stopped him.

"Not in kind or degree. All men are alike; their powers and characters depend upon external impulses. That wonderful entity, man's mind, is but a kaleidescope, which unfolds every emotion in succession; every change is a succession; no two emotions are capable of being sustained at the same time."

"You think, then, with Dr. Thomas Brown," said I.

"Quite so. Dr. Brown had a giant mind, compared with whom Gall and Spurgheim and even Combe were idiots."

"But do you not admit, Dr. Smith," said I, "that individuals have different tastes, dispositions, and talents."

"In the popular meaning of the words I hold with you."

"Can any amount of education make a man not naturally qualified, a distinguished musician, poet, mechanic, or metaphysician; must he not be born so?"

"Not necessarily."

"But was there ever an instance of the reverse? Name one."

Dr. Smith was silent.

"I am quite anxious to hear of one."

Still no reply.

"Well," said he "suppose I

grant you are right for the sake of argument."

"Then," said I, "is it not advantageous, is it not an incumbent duty to ascertain if we can what the natural qualities of an individual are?"

"Taking your view of the matter it is."

"I think so in any case," I replied, and I turned to the actuary.

"I believe you are right," he replied."

"Dr. Smith," said I, "your natural endowments or phrenological developments are very remarkable."

Dr. Smith smiled grimly, and said:

"I would never allow them to be estimated. I would never appear to give countenance to such rubbish."

"But," said I, "you have not given me a single argument against phrenology. Convince me I am wrong, at least. With your giant powers that ought to be easy."

"Well," said he, "phrenology is utterly opposed to the anatomy of the brain. As a medical man, I have dissected thousands of brains, and while I have found nerves leading from the brain to the nose, eyes, tongue, &c., I have found none—nor has any one else—connecting the skull and the brain in those portions which are falsely called phrenological faculties."

And the doctor broke out into a small, short, husky, ironical laugh.

"But," said I, "analogy, even if we establish it between the different parts of the body, proves nothing absolutely one way or the other, so the burden of proof to establish the analogy rests with you."

"No, no," said Doctor Smith, "you phrenologists dwell much on the analogy between the organs of the senses and those which you suppose exist in the cerebrum—the larger convoluted portion of the brain."

"I do not admit the hearsay arguments taken second hand, as any evidence at all on a question like this. It can only be settled by statistics," and I turned, laughing, to my old Scotch friend.

Dr. Smith laughed too.

"But, returning to the anatomy of the brain," I said, "Is it not reasonable on the score of the different character of the functions, to suppose a great difference in the structure of the phrenological organs in the brain and those of the senses, which are, after all, primarily but mechanical operations."

"Quite so," said Dr. Smith, "provided you are correct in your *à priori* assumption. But what I object to is the extreme dogmatism of the phrenologists in mapping out portions of the brain, and allotting them to different faculties. We know so little about the functions of the brain that it seems impossible even to settle the question of the receipt of impressions on it through the external organs of the senses, much less such operations as you speak of, those of the so-called mental faculties. For my part, in early life, on more than one occasion, at the suggestion of my friend Combe, I made sections of heads where phrenological faculties were largely developed, and I found no bump or swelling on the brain, which ought to have been the case if phrenology were true."

"Why so. Is this a fundamental principle of phrenology? I never heard of it being so."

"Then it ought to be so," said he, "for unless you lay down some proposition of this sort I do not see how we can argue at all. I do not see, for the life of me, any shadow or even counterfeit of reason in phrenology, that is not based on the anatomy of the brain."

"And yet," said I, "all that you adduce you say is contrary to it."

"Precisely so, and therefore I think phrenology is a baseless hypothesis."

"But," said I, "phrenology is the science of physiognomy applied to the skull and living head, that of

interpreting external signs, which point to the qualities of man as a being and as an individual. Phrenology must rise or fall here, for I agree with you that we know scarcely anything of the internal functions of the brain. We have not hitherto set about ascertaining what we can, with a hope of success—that is on a basis of what we can externally see. Physiognomy is the first step in science. Do you admit this?"

"Not at all; bones and tissues should be studied first; until one handles a specimen in a museum one knows nothing about it."

"But are not living animals much more important?" said I.

"From a popular, but not from a scientific point of view. Our systems of classification are almost entirely based on the hard, immoveable parts, such as retain their form after death. These soft, yielding parts are very unstable; only the shallowest naturalist would base much conclusion on them," said he.

"Your science, then, begins with death, rather than life, and would substitute the skeleton for the vital, palpitating mass. This appears to me quite an inversion of the order of nature. But we are straying from our point. I want to be convinced of the falsity or truth of phrenology. Have you ever seen it practically tested, for if phrenology guides us to a knowledge of what man is during life, surely it must be proved or disproved during *his* life. For my part I have never seen a case when the brain was healthy, in which the phrenological indications were not in accordance with character and powers. Have you, Dr. Smith?"

"Many."

"Would you be so kind as to name a few?"

"There was one notable instance when Dr. Spurgheim, the greatest of phrenologists, described the cast of a skull as pointing to a very fine intellectual development, and which turned out after all to be but the cast of a monstrosity of a turnip," said Dr. Smith, laughing. "So you see what mistakes phrenologists make."

"I have heard this turnip story before. There is no foundation for the report that Spurgheim ever considered it a skull. It was brought before him as a practical joke. The mistakes of phrenologists, *when* they are mistakes, are made so much of that I am inclined to think that their opponents have a great belief in the general truth of the science; otherwise they would not so eagerly catch at any supposed blunder. The blunders or miscalculations of mathematicians do not invalidate the truth of mathematical problems, nor those of astronomers those of astronomical calculations; nor do the manifold and innumerable contradictions of doctors, the popular belief in the value of medicine. All proceed from human fallibility; and yet phrenologists are expected to be infallible, if phrenology is to be acknowledged as a truth. Was ever such folly known? Would you not consider your patients outrageously unreasonable who dismissed you on the ground of your differing from your colleagues on the nature of a disease?"

"Certainly," said Dr. Smith. "I should consider the noble science of medicine insulted."

"And why?" said I.

"Because medicine is an established science, at least 2,000 years old."

"Then it ought to be much more perfect and infallible than phrenology. But all this argument is of little value. You have yet to give me an instance of a human character which differed from its phrenological diagnosis, Dr. Smith."

"In the course of my long life," said he, "I have met with many cases where men, according to phrenology, should have had magnificent intellects, and who in reality were rather below par."

"But these are only general ob-

servations; cannot you give me a special case?" said I.

"The other day a friend of mine had his head examined; he was described as a metaphysician, but in truth he had no taste for metaphysics," said he.

"What sort of a man was he? Was he a great reasoner and fond of argument?"

"Yes, but not of metaphysics."

"What were the exact words used by the phrenologist?"

"He was a Frenchman, and said that the *esprit de métaphysique* was very large in him."

"This," said I, "is the old term for Causalty, that faculty which prompts man to enquire causes and origins. A great metaphysician was never without it, but every man who has it is not a great metaphysician. Did the phrenologist say your friend was a great metaphysician, or that he had a great talent for metaphysics?"

On this Dr. Smith turned to my old friend, and said, "Simpson, the philologist, you know."

"Ah, old Simpson, has he been phrenologized? Well, he has often told me that he only escaped being a metaphysician from being educated at Cambridge. Therefore, my young friend, you may consider this rather a case in favour of than against your science," and he laughed.

On this his wife and daughter came into the room.

"Oh," said she, "we overheard you partly from the garden, and I want to hear the end of the argument."

"Well, Dr. Smith, let us have another case," said I, "if you are not convinced."

"Convinced? Never to the truth of your science. Phrenologists hold that the brain being the organ of the mind, the loss of any part of it is accompanied by a loss of corresponding mental function. Now, I have met with several cases in which portions of the brain have been removed by operations consequent upon fracture of the skull, and the patients have lived and acted rationally for some days; and in one case the patient actually recovered and lived for years."

"Can you give me the details of these cases? What portion of the brain was removed? Was it of both hemispheres? And if in this case, were the opposite portions of each answering to the phrenological organs removed or lost?"

"I can't give you any details."

"Then," said I, "I do not see how we can argue on the case at all, for from the circumstance of the phrenological organs being *double*, corresponding with the two hemispheres, without the loss of the corresponding parts of both, these organs are not extinguished; and unless this were completely effected, I do not see how we could take this as the basis of an argument. And even in this case we should require to know the mental qualities of the individual, before and after the loss of this part of his brain. I have read of instances similar to the one quoted by you which tend to prove the truth of phrenology; for individuals formerly distinguished for qualities, on the loss of those portions of the brain, corresponding with the phrenological organs, lost the qualities believed to be associated with the part of the skull and brain injured. But these cases of persons living after losing portions of the brain are so uncommon, and a knowledge of the characters of the individuals, before and after, is so difficult to be obtained, that I dismiss these cases when taken second or third hand, as of little or no value. I have no confidence in anything but practical phrenology. Living cases such as are found in every house; ourselves and our neighbours; those whom we know best, prove the truth or falsity of the science."

"But the practical difficulties of phrenology are quite insurmountable, for the skull is apt to be studded with bony excrescences, which interfere with any approximately correct diagnosis on phrenological principles, presuming they are right," said Dr. Smith.

"How many instances have you met with of this?"

"I cannot say—hundreds."

"In the living head?"

"No; two or three only."

"Could you discover these bony excrescences?" said I.

"Of course I could, as an anatomist."

"But are there not phrenologists who have some knowledge of anatomy?"

"Not many."

"And you can always tell when a skull or living head has bony excrescences?"

"To be sure; I have already told you so."

"These are as different," said I, "from the phrenological organs indicated on the skull as warts and moles are from a glandular swelling on the flesh. I have verified this myself, and it never gave me the least difficulty. They are a totally different shape from phrenological organs; they seldom occur on their centres, and I never heard of any instance of their covering a large portion of the skull of any man who retained his senses. Have you nothing to say, Dr. Smith, about phrenology and lunacy?"

"Only that phrenologists are lunatics," said he. "I am not going to let you think, Sir, that phrenology is lame here; quite the contrary, for lunatics, mad though they be, show characteristics quite in accordance with their phrenological organization. But it is a *diseased manifestation.* A hydrocephalic patient is true to his phrenological organisation, although the manifestations are likewise diseased."

"Have you any convincing facts for me?"

Dr. Smith was silent. He hung down his head and looked sullenly profound.

"But," said I, seriously, "phrenology must stand or fall on its practice. I should be glad to give you a demonstration of its truth, if you will bring forward any stranger to me."

On this the wife of my old friend spoke:

"Oh, John, would not this be a good opportunity to get our young friend's opinion of our boy's powers?"

On which the youngest son was sent for. I had never spoken to him before or heard of his existence, but I described him as having an active and intelligent mind, prone to study, alternating with muscular exercise. His capacities were varied in the extreme, but not great. He was likely to make respectable proficiency in most things, and to succeed well in passing examinations. He, however, would in all probability be more valued at college than in practical life. There were several points which I dwelt on in some detail, which the young man's mother and sister and himself acknowledged to be strikingly true, and which were fulfilled afterwards to the letter. Dr. Smith turned his head away and endeavoured to appear not to hear what I said, but it was easy to see that he was quietly listening. Both my old friend and his wife were now firmly convinced of the truth of phrenology, for one point of character was known only to the mother and the young man himself, his disposition being so quiet and reserved that he was reckoned quite an enigma at college. The lady of the house on this asked me to write down a short account of those principles of phrenology which I had demonstrated myself, as some little guide for her, having made up her

mind to study the subject, and I complied with her desire.

While phrenology has not been openly acknowledged by the public, a great part of its phraseology and classification have been adopted, and even a certain rough-and-ready, practical phrenology, which prompts persons to say an "intellectual forehead," "a villainously low type of head." But some of the more enlightened and honest of the past generation knew its value, and, what is more, had the courage and the honesty to say so Richard Cobden, a great observer of men and manners, said,

"A knowledge of phrenology has done everything for me. There can be no doubt of the great utility of phrenology to those who understand its principles."

These remarks are thoroughly characteristic of the great politician; but for politics, no doubt his sledge-hammer intellect would have come down hard and strong on the opposers of phrenology, and have made him as distinguished as a moral, social, and intellectual, as he was as a political, reformer.

I could mention a score of medical men, directors of lunatic asylums, who found phrenology indispensable to their practice. I will but quote the opinion of Sir William Ellis, physician to the Middlesex Asylum.

"I candidly confess that until I became acquainted with phrenology, I had no solid foundation on which I could base my treatment for the cure of insanity."

Literary men have received phrenology rather better than have the medical profession. Mr. Robert Chambers, the well-known geologist and editor of *Chambers's Journal*, gives his important testimony to the truth of phrenology. He said,

"By this science the elementary faculties of the mind have been for the first time traced to their elementary form."

That illustrious scholastic reformer, the Hon. Horace Man, said,

"I declare myself more indebted to phrenology than to all the metaphysical works I ever read. I look upon it as the guide of philosophy and the handmaid of Christianity."

The enlightened and practically wise Richard Whately, Archbishop of Dublin, gave his firm support to the science, and said,

"All moral and religious objections against the doctrines of phrenology are utterly futile."

The present learned Bishop of Gloucester and Bristol has a high opinion of the science; and last, but not least, that giant-minded, world-renowned theologian, Dr. Thomas Chalmers, who at first strongly opposed the science, before his death said,

"Phrenology has added a new and verdant field to the domain of human intellect."

The Rev. H. W. Beecher, brother of Mrs. Harriet Beecher Stowe, says,

"If a man wishes to know practically what he is made up of—if a man wishes a knowledge of human nature for definite practical purposes—there is no system which will aid him in acquiring that knowledge like the system of phrenology; not interpreted too narrowly and technically, but in its relations to physiology and the structure of the whole body. I may say here what I have never said before in the pulpit, that the views of the human mind, as they are revealed by phrenology, are those which have underlayed my whole ministry. And I could not ask for the members of my family, nor of the Church, any better preparation for religious indoctrination than to put them in possession of *such practical knowledge of the human soul as is given by phrenology.*"

(To be continued.)

FRUIT AND FLOWER CULTURE IN THE WEST INDIES.

West Indian fruits are brought to England, but do not occupy the place in our markets which we might expect from the luxuriant growth and abundance they attain in the West Indies. The British public are not reluctant to avail themselves of juicy succulents from the Antilles, but the West Indians have as yet shewn less energy in their cultivation and less skill in their packing and transport, than is displayed by the Maltese, the people of the Canary Isles, Portugal, Algeria, and other purveyors of foreign fruit.

With a view of stimulating what the author believes is an important and but little developed branch of trade, this paper has been written.

The orange family of plants present a source of profit, greater than any other, if we perhaps except the banana; but here the taste and demand is very limited, partly because the banana is not sufficiently abundant and cheap to become an article of every-day consumption in the homes of the middle class, and partly because the taste for it has not yet been acquired. Yet notwithstanding it forms an excellent article of diet, both for nutriment and palatableness either raw or cooked.

Of the orange family the bitter, or Seville variety, is the most worthy of culture, for the flower yields the *oleum neroli*, an essential oil, which brings twelve shillings an ounce and upwards, and is indispensable for the manufacture of eau de-Cologne and many other perfumes. The oil of the rind is best extracted by means of a grater full of metal spikes usually made of brass and thickly tinned. Skilled labour is not necessary for the preparation of oil in this way, for women, children, and the simplest labourers can prepare the oil with the grater. After the major part of the oil is extracted the fruit is fit to be cut up for the manufacture of marmalade, either with sugar or hermetically sealed in jars or bottles; without sugar for the manufacture of tarts or as a substitute for citron in cakes, puddings, and mince pies. In the ordinary course of the manufacture of marmalade, the essential oil, though the most valuable, is a wasted product. Besides the flower and rind oil, the leaves of the plant afford by distillation a third essential oil which is extremely valuable in commerce. It is usually distilled with refuse orange rind and is known in consequence as "*petit grain.*" A gentleman from Honduras, assured the author that he made about £250 per annum after all expenses were paid, by the produce of about two and a half acres, covered with the bitter orange, and that by selling the fruit, which he did at not one-tenth of the price which it fetches in England. He calculated that when he established the manufacture of marmalade and essential oils, he could about double his income from this land, and accordingly he ordered from France, a supply of graters and two skilled labourers to instruct the natives in what was to them a new industry. In a letter dated October, 1875, he says that his industrial scheme has fully answered his expectations and that he could easily make a fortune had he sufficient capital to enter largely into this industry. The perfume oils he uses on the spot, finding that there is ample demand for them. A great deal of the marmalade is consumed on the spot, the remainder sent to the United States. His profits for the year 1874, 1875, twelve months, were about £580,

all from the produce of two and a half acres of very large orange trees. What is a profitable industry in Honduras would be so in Jamaica, Barbadoes, Tobago, or any of the West India Islands where oranges flourish. He has about a quarter of an acre of limes, which he treats in the same way. The trees are not so old as the orange trees, but still they afford him a profit of about £40 a year. The citron also, so far as about ten trees are concerned, affords a most profitable return. He is enabled to send to the United States candied citron, which gives him a clear profit of about £50 to £100 per annum, with a prospect of increase, as the trees have not yet attained their full development. At first he had great difficulty in making the fruit equal to the best candied fruit of Europe, but now he would not be afraid to stand comparison with any, considering that his raw material is of the best quality. The sugar he uses is centrifugal crystals, and pure white.

Among other fruits which should certainly be brought to Europe, either dry or preserved with sugar, may be mentioned the guava, the paw-paw, the mammee apple, the sapodilla, the custard apple, and the pine apple. It is true that the guava, in the form of jelly, and the pine apple, in a fresh state, come to England; but the guava jelly is not nearly so well prepared as it might be, and the pine apples, being mostly gathered before they are ripe, are too hard and woody to compete successfully with the hot-house pines of Europe. Now, splendid pines have been brought from Antigua to London, almost equal to those cut on the spot. They have not cost more than twopence halfpenny in Antigua, and they have been sold at 7s. 6d. each, at wholesale price, in London. What a margin to pay for freight and casualties! An Antigua gentleman told me a friend of his had made a thousand per cent. by a small adventure of this sort. The pine apples were packed in casks, with holes pierced to admit of ventilation, so that very few were spoilt on the voyage. Were a portion of a fast steamship especially appropriated to fruit, and means afforded to ensure coolness and ventilation, it might be expected to reach in a much better condition than is commonly the case. Pine apples might even be imported in pots, growing, and thus their excellence might be assured. Such fine fruits would be saleable at from 1s. 6d. to 3s. 6d. per pound; and if such were procurable in Antigua and Tobago at 1d. per pound, or less, there would be ample margin for freight, and an enormous profit. Let importers consider what may be done in this way, for, at the present low prices of sugar, this industry is unprofitable.

The banana is capable of yielding, in localities in the West Indies favourable for its production, a clear profit of £100 per annum per acre. A citizen of the United States, a Mr. Cassim, shewed the author a tin of farina, prepared from the banana, a food excellent for infants or invalids, and, perhaps, nearer in properties to the description of the manna on which the Israelites lived than any known food. It was highly nitrogenous and starchy, and had a natural sweetness, which rendered it difficult to believe that it was not artificially sweetened. He said this fruit might be made in the British West Indies at 1d per pound, and packed in tins at 1d. extra, and freight, package, and landing charges need not be more than a halfpenny, so that for twopence halfpenny cost a food could be prepared, which only required advertising to supersede corn flour, arrowroot, tapioca, and sago. He said that he had introduced it into the United States, and that it was taking well, and afforded 300 per

cent. profit. This is surely worthy the attention of English speculators. The fibre of the banana leaf, usually wasted in the West Indies, is valuable for cordage, and is know in the East as Manilla hemp.

The West Indies as a whole should supply us with a large portion of the jams and jellies, as well as the tinned fruits consumed. That they do not do so, is entirely owing to the want of energy and capital of the colonists, who continue to make sugar under circumstances when competition with the beet-root and bounty-paid continental refined sugar is ruinous.

With a view of directing some of the latent capital which has been accumulating for the last few years, in consequence of insufficient opening for sound commercial enterprise, to the West Indies, where it may be safely embarked in the cultivation of fruit and its export, this paper has been written. It is a good time now to start any industry of the kind, when, owing to the enhanced price and unhealthiness of much of the butchers' meat sold in the United Kingdom, the attention of economists is forcibly directed to that of the vegetable kingdom, as affording economical, health-sustaining food; for surely the nitrogen, carbon, hydrogen, and oxygen, which we require for the support of our bodies, can be much more cheaply obtained for us from the natural products of the vegetable, than from the animal kingdom. Nature affords us vegetables at a wholesale price, while in case of animal food we have to pay the profits which the animals demand. Hence sustenance in animal food is enhanced in price.

"The Island of Montserrat: its History and Development chiefly as regards its Lime-tree Plantations, with a short description of Lime Fruit Juice as a Medicinal Agent and as a Beverage" (Carlisle: Hudson, Scott, and Co., price 1s.), is the title of an interesting pamphlet which, after giving a slight historical sketch of the island, proceeds to give the result of the labours of Sturge's Montserrat Company, now the Montserrat Company, Limited. The first lime-tree orchards were planted in 1852 by Mr. Burke, who had not sufficient capital to develop the industry. The lime flourishes best in light soil near the sea and comes into full bearing after seven years planting of the seed. The plantations of the company consist of 600 acres and 120,000 trees; they are planted 15 feet apart. The limes are carried down to the works to two central factories, where they are sliced by water power, and afterwards squeezed until all the juice has been expressed. The juice from the choice fruit is put up in casks to exclude air; the inferior fruit is boiled down for the citric acid makers to the consistence of syrup. Besides this, they prepare, on the grater principle pursued in France, the essential oil of the rind of the lime. The consignees of these articles are Messrs. Evans, Sons, and Co., Liverpool, and Messrs. Evans, Lescher, and Evans, London. The various products, from being prepared with scientific skill, are superior to those of other colonies. The lime juice being similar to lemon juice in properties, it is equally good, if not superior, as an antiscorbutic, and for the cure of rheumatism, dyspepsia, gout, and for making acidulated drinks.

This is so generally acknowledged as regards scurvy, that by the amended Merchant Shipping Act, which passed on August 20, 1867, it was rendered compulsory for every ship to take on board, lime or lemon juice. The Admiralty use lime juice only for the Navy. The constant use of lime or lemon juice of good quality, will, according to our experience, render gout impossible, and greatly discourage a vast variety of complaints, such as tumour, cancer, dyspepsia, bilious

disorders, stone and other complaints of the bladder, which the present luxurious state of living on liberal flesh and alcoholic diet without its corrective aid, tend greatly to foster. This vegetable acid should be as daily an ingredient upon the dinner table as salt, and as the main ingredient of sauce, for almost every article of food, it has no equal. It is far more wholesome than vinegar to mix with oil as a salad dressing. I believe that there is a fine opening for a new sauce, of which the basis is lime juice instead of vinegar. We have a private receipt ourselves, which surpasses any other sauce in our estimation, and is much more wholesome than any combination of vinegar Among the applications of the lime fruit juice, a very useful one is Carr's lime fruit biscuits, which contain forty per cent. of lime fruit juice; these are useful to dyspeptic patients, and those who wish to take lime juice with their food in a portable form. Among the other preparations of Montserrat limes is Messrs. Cantrel and Cochrane's of Dublin, lime juice champagne, containing no alcohol, which is a very attractive substitute for lemonade. The Montserrat Company put up their lime juice in quart and pint bottles, and the Limetta of pure lime fruit juice cordial, both excellent in their way.

SHOULD MUSIC RECEIVE THE FIRST PLACE IN FEMALE EDUCATION.*

THE faculty of appreciating sounds and their harmonies is common to man, and to at least some animals. The ancient Greeks in truth thought that all nature was influenced by such music as that of Orpheus. Whether this was a serious belief, or one which enunciated merely the rule of harmonies in nature, we shall not at present discuss, being content with finding in ancient as in modern times that man was under the influence of music. And surely we do not require to go far. One glance through "the seven ages of man" will show us that from infantine warbles to the droning notes of man on "his last legs" his life is full of music. How then should we direct and how control an influence so potent? Music has power to represent every shade of thought and every class of emotion and passion, good or bad, in which it is only less potent than articulation or literature. But the habit of its professors has been mainly to cultivate music of a kind which stirs the lower passions and more frivolous feelings amongst mankind. Hence the practice of music, or rather the practice of such music, has a tendency to dissipate and frivolise—even if it promotes to some extent — harmony amongst those united within the circle of its influence. Tired with the day's bustle and toil, the busy man is soothed in that hour which precedes complete repose, by the strains of domestic music, in preference to pursuits which stimulate thought and a thirst for knowledge. For although music is capable of stimulating thought and exciting the faculties of the mind, yet it does not in itself, like most branches of physical science, con-

* Report of the Royal Academy of Music, 1877

tribute directly to useful knowledge. This therefore brings us to our point. Primary education should consist of those branches of knowledge which most contribute to stimulate the mind to greater efforts, and make it dissatisfied with present attainments, unless as steps to those seen in the high distance of greater attainment. Therefore, as a human improver, physical science must stand before music.

No branch of study is less capable of being successfully followed by those who have not a special natural endowment for it than music, although it is true that fashion, now the drill-sergeant of Europe, turns out annually hundreds of regiments of self-styled vocal and instrumental performers, whose strains for the most part assail the cultivated or naturally melodious ear more discordantly than do the cries of the farm-yard, the roar of the factory, or the hum of a great city, and why? because the former fails and the latter succeeds in a concert. Of 250 persons, who had spent not less than five years of time, and not less than £50 in money, in learning what they called "music," not more than four were pleasing instrumental and three good vocal performers. What an unsuccessful lottery this pursuit of music is, for out of 250 ticket only seven yield prizes! Two hundred and forty-three are blanks—worse than blanks—mere waste paper, as utterly useless as cracked trumpets on which some ass brays for our disturbance. Is this a result satisfactory to rational beings who claim to be superior to asses, but whose utterances are meaningless? Will this satisfy the human or the divine critic of a life, to have spent five years thus fruitlessly? No. The two hundred and forty-three beings who have wasted five years fruitlessly in the vain pursuit of harmony might have spent this time in the acquisition of useful knowledge which would have stimulated them as long as they had breath to greater intellectual efforts, as well as perhaps fitted them to fulfil well what stern necessity might compel them reluctantly to follow—a profession. Let those seven cultivate sweet sounds, but let the two hundred and forty-three listen in mute admiration; their minds will then get as much as they can get from music, provided they have judgment to discriminate its teaching, and sympathies to appreciate its feelings, which are often wanting amongst those who are most loud in their expressions of admiration of popular performers.

If asked what might best for the majority of human beings take the place of music as an educator, we should in one word say, SCIENCE. Music studied scientifically is *science;* music studied practically is an *art.* Not one in a million is interested in the study of the science of music; but the majority of us, in youth, at least, take an interest in the natural objects by which we are surrounded, by whose study we learn the laws of nature, and their useful applications to our individual wants. It is only when perverted parental care, unhealthy scholastic training, or the threats of the drill-sergeant of fashion turn us from our natural inclinations that we walk as we are led on the road that leads to NOTHING.

Let every child receive his first education by object lessons, which cultivate the powers of seeing, "for the light of the body is the eye." The articles in daily use, the first necessaries of life should be the first instructors, every object studied in proportion to its utility. Those that feed and clothe the man, that go to his lips, that cling close to his skin, are his best friends and teachers. The air he breathes, the ground on which he treads, and the living myriads that float in it or walk upon it, offer the best second lesson to mankind. No man need be badly educated who learns such

lessons; every branch of study is easier to one trained closely to observe nature. Schools and colleges, which for centuries have rusted out the very joints of their life in the pursuit of antiquarian scholarship, or the unpractical portion of mathematics seek to repair their decay by a plaster of modern science—a plaster which will only the sooner, by its very weight and profundity, promote the dissolution of their rotten system. Their constitutions are beyond cure; the old materials alone are valuable. Let schools and colleges be reconstituted as palaces of science; beginning with objective knowledge, let them rise to subjective knowledge. Beginning with living men's tongues, let them hereafter learn to dig in the graves of the dead. Living heads are better than skulls. If we would study the first principles of anthropology, let us study the living, for it is the knowledge of the living that can alone enable us to form any opinion of the dead. So after we have studied the form of man and animals we may sit down to rest, to listen to their voices or imitate them by instruments; for all instrumental music is at best but a bad imitation of vocal music. As a practical result of thus inverting the order of the instruction of nature, we see life wasted and music itself not advanced; for notwithstanding that now millions cultivate music whose ancestors were mute, this age has not produced a Handel, a Beethoven, or a Mozart. But, on the contrary, music has been vulgarized to a lower pitch than has been known for two hundred years. Musicians can only elevate themselves from their depravity by being deeper students of nature, its forms, and its sounds, than of published works. When they are content to do this, we may expect higher and purer music than any previous age has produced.

The strains of music are often valedictory, and as it is our object to induce this feeling amongst its votaries we will avail ourselves of the only resources at present within our grasp—those of literature. The pen and the voice often move together, and the first is the recording medium of the last. Hear what Shakespeare says:—

"And bring your music forth into the air.
How sweet the moonlight sleeps upon this bank;
Here will we sit, and let the sounds of music
Creep in our ears; soft stillness and the night
Become the touches of sweet harmony.
Sit Jessica, look how the floor of heaven
Is thick inlaid with patines of bright gold.
There's not the smallest star which thou beholdest
But in his motion like an angel sings,
Still quiring to the young-eyed cherubim,
Such harmony is in immortal souls;
But, whilst this muddy vesture of decay
Doth grossly close it in, we cannot hear it."

Music that might be rightly set to such words, that would harmonise with such sentiments, would require an effort of mind almost as great as human thought can reach.

"And ever against eating cares
Lap me in soft Lydian airs,
Married to immortal verse,
Such as the meeting soul may pierce,
In notes with many a winding 'bout
Of linked sweetness, long drawn out,
With wanton heed and giddy cunning,
The melting voice through mazes running,
Untwisting all the chains that tie
The hidden soul of harmony,
That Orpheus self may heave his head
From golden slumber on a bed
Of heaped Elysian flowers, and hear
Such strains as would have won the ear
Of Pluto—to have quite set free
His half-regained Eurydice."

Next to the human voice, nature's best instructors in sound are birds. The song of the missel thrush has a clear mournful sound, and is heard more clearly on the approach of stormy weather; it is like that of the broken-hearted, who yet sing in mockery of their woe.

The voice of the song thrush is one of the most pleasing that we commonly hear; its melody is both cheerful and sweet, and has just sufficient plaintiveness to move our tenderer feelings without drawing every chord of our affections, and opening every old sore which time and change of season had healed. The song of the thrush inspires us with pleasant emotions, for before the winter is passed its strain begins. In like manner a pleasant change may pass over our feelings, for in the midst of trouble our spirits begin to rise, though the relief has not yet come.

The woodlark has a sweet and plaintive song that moves us more than any bird's. Burns compares it to the sighings of a broken heart, which is not silent in its grief but pours forth its feelings to be echoed by the woods. Its mellow notes are so like the moanings of wind through reeds and water, that it might well have been sacred to Orpheus.

The skylark's song surpasses the nightingale's, or any other bird's, in aspiring loftiness of tone. It is pleasing to watch it soar, singing as it rises on high, until it is lost to human sight. But it cannot leave the earth from whence its subsistence is derived, or remain long in its high position. Neither can man when elevated on the wings of his imagination, for he must soon descend to the dull, common places of every-day life.

The music of the nightingale is the concentrated song of a variety of birds. Its executive power is equal to the quality of its tone and the extent of its scale. It combines the mellow sweetness of the woodlark with the sprightliness of the skylark, and the essence of the other warblers of the grove. Its voice is more penetrating than that of any other bird, for it can be heard as far as the voice of man can reach. The late hour at which it sometimes sings enhances the effect of its voice, for most birds are then at rest. It thrills through the still air an evening solo to conclude the daily chorus of adoration which nature, in her beautiful and varied language, pours out to her Creator.*

Dryden's "Alexander's Feast" would be suited for quotation here, as the best literary illustration, in our language, of the power of music.

A LADY BIRD TAMER.

DURING the unusually inclement winter of 1867, she determined on trying how far she could succeed in taming a robin, which had been observed hovering round the evergreens. With this view, to attract notice and familiarise the hungry little stranger, bread crumbs were scattered on the path. The next movement was to place the food on a very small light tray. When thoroughly accustomed to come to the tray, she ventured to stand by. This probably was the most difficult part of the experiment, as, from the instinctive dread birds have of the human eye, it is at first almost impossible to inspire confidence, fully proving the truth of God's word to Noah, Genesis ix. 2, "That the fear of man and the dread of him should be upon every beast of the earth and upon every fowl of the air."

Urged on by want and sight of abundance, the trembler approached

* From the "Book of Nature and the Book of Man," by C. O. G. Napier.

nearer and nearer, fixing its eager round black eye on every glance of its benefactor. By degrees, in the expressive words of the poet, "it picks and starts, and wonders where it is," and rushes off with the largest crumb it can select. This first stage of taming must not be hurried on, as on patience in the outset depends success. Slowly it should progress, day by day, and week after week. The tray is next to be placed across the tamer's foot; then is lifted to the knee, then to the hand, and so on until it is held between the teeth and the crumbs laid on the lip, by which time, finding that it is not molested, the fascinated little captive will follow the tray wherever it is placed. From this time it begins to be accustomed to the voice and answer to its name, which, in the case above mentioned, was Binnie. And so gladly does it hear the well-known call, that it will be seen darting from the highest tree to welcome both the gift and the giver, most fiercely attacking any other robin that is hardy enough to approach the valued treasure. The opening spring brings the *hen*, who sits on a spray, close by, evidently wondering what is to become of her mate, who seems to take pleasure in proving that there is not the slightest occasion for alarm, chirping the while, and calling her to partake of the good cheer; gathering the crumbs and carrying them to her; putting them into her bill, seeming to say, "You little coward, see what a treat you are losing." After a long struggle with her eagerness and terror, she, too, ventures to the bait on the hand, she starting with consternation as she feels the warm palm beneath her little icy feet. The most interesting part of the teaching is when the birds have learned to peck, one off the right, the other off the left hand, both so well knowing their own, and never intruding on each other's portion.

Then comes nest building, in which both busy little architects are engaged, and only answer to the call at intervals.

Next the hen disappears, and her mate is heard warbling his sweetest song on the tall ash tree, or is seen flying off to the distant thicket with food, by which means the nest is reared; and there in the hollow of a moss-grown tree, with a tiny curtain of ivy falling over it, at last is found the faithful little robin, standing on the edge of the nest feeding his imprisoned spouse with the crumbs he knows she loves so well! Sometimes the hen makes her appearance at the trysting place, looking sadly shrunken, and with feathers tangled and worn; meantime her careful help-mate has taken her place in the moss-grown retreat. Soon a chirping is heard in the nest, and all is bustle and fidget, and the birds are seen alternately employed in supplying crumbs to a nest full of open mouths.

After a week or so, five small half-fledged robins are seen struggling after the parents to the old seat under the hawthorn tree, the elders well knowing there is a hand there which will provide for all.

At first the inexperienced brood sit on the evergreens close by, and are fed by the old ones. But at length, taught by observation and experience, they too climb upon the hands and lip; the parents sitting by, marking with expressions of joy their approbation of their nestlings' efforts, no doubt extremely well pleased at being saved the trouble of searching for and digging up worms for the sustenance of five in family. Thus matters remain until after midsummer, when the young birds seem to take to flight, and set up in the world for themselves. But the original pair still continue to frequent the arbour, and during the molting season look so wretched and pitiable that one is tempted to wonder how they manage at such a

time, when not aided by human kindness; but watched over by one who has held them up as man's instructors, they come through all their vicissitudes, and are again heard warbling as the tinted autumn leaves are dropping around their summer haunts. Then return the cold dark winter months, with sleet and drifting snow, and there beneath the evergreens are found the well cared for truants, who gladly pick their plentifully provided daily food, sometimes finding their way through the porch door into the dwelling house, where they take their walk round the sitting room, snatching up little bits scattered on the carpet, and then quietly retiring again to their peaceful, leafy nook, where during every ray of sunshine that brightens the dull wintry day, whilst other more distinguished song birds lie silent and hidden, they pour forth their sweetly welcome note, until the first glimpse of spring comes to cheer and enliven the scene and call them forth to the sheltered alder grove once more.

M. P.

EARLY GREEK PEOPLING OF BRITAIN.

Part I.

The next civilized nation after the Phœnicians who had intercourse with Britain, appears to have been the Greeks. As the Phœnician name Britannica, corrupted from Britanac, the land or field of tin, was the earliest appellation of our island, and has adhered to it in all ages, so the Greek name Cassiterides or tin islands, was the second and only a means of expressing in another language the same idea of the source of a necessary of civilisation. Strabo, in his Geography, Lib. iii. says, "At the beginning, the Phœnicians alone traded to Britain from Gades and concealed from others this navigation; but when the Romans followed, a certain master of a ship, that they themselves might have this traffic of merchandise, he, upon a spiteful envy, ran the ship on purpose upon the sands, and he that had brought them followed into the same danger of destruction himself, escaped the shipwreck, and out of the common treasury received the worth of the commodities and wares he had lost."—Sammes, page 74. It seems probable that the Greeks, first voyaging with the Phœnicians, through the Straits of Gibraltar, acquired a knowledge of the route to these islands of tin, and that they afterwards fitted out expeditions to them for the purposes of trade, but that they, as Rome began to dispute with them the empire of the Mediterranean, protected their commerce as far as possible from her encroachments. According to St. Hèrome, in his questions on Genesis, quoting Varro's book of antiquities, Sinisus Capito, and Phlegon the Greek, proves that the whole sea coast of Europe, including that of Britain was inhabited by Greeks, or at least there were Greeks scattered there, probably sailors and merchants who kept depots for the purposes of trade. In the days of Julius Cæsar Greeks were settled in the heart of Gaul, retaining their language, religion and customs. It seems probable that they visited Britain sooner than Gaul, from the term Cassiterides being of greater antiquity than any Greek term for Gaul. The early chronology of Britain seems to stand in the following order. There is first

the era of the Cyclopæan and Finnic Hyperborean peoples; then that of the Phœnicians who were gradually succeeded by the Greeks. It seems as if the main body of the people of Great Britain, whose descendants we now see, were aggregated in this Phœnician-Greek era. Perhaps the first settlers were comparatively few in number, but finding a fertile soil, and a country of great natural resources, they multiplied rapidly. The remoteness of the time and the extensive destruction of early British records, have caused this period of British history to be obscure, and scanty in reliable detail. Still there seems no reason to doubt that the earliest civilization of Britain was Phœnician and Greek. The Romans, finding a wider territory than Greece could afford, and a climate more adapted for developing the vigour of the human constitution, grew with a sturdiness and with a solid strength which had not before been equalled in human history, and formed roots that will last in greatness to the end of time. But we must never forget that Rome was not a nation. It was an aggregation of nations, a mighty conglomerate of divers materials, which from the harmonious manner in which they adhered, possessed qualities in common to a greater extent than other great divisions of the human family.

Blumenbach, in his term "Caucasian" embraced the Jew, the Arab, the Syrian, the Hindoo and the European. He was aware that some general term must be coined for expressing a great division of mankind. But as Caucasian would only be satisfactory on the assumption that these nations had their birth in the Caucasus, so another term must be substituted. *Semitic-European*, expresses our thoughts better than any other word.

In the days of Cæsar, the Greek language was not only spoken in Britain but in the high and mountainous parts of Gaul by the Helvetii. Sammes informs us, "that learning by this time had found its way even into those parts, out of which the inhabitants themselves, weary of their country, scarce could find a passage. The Helvetii, after they had burned their houses, agreed upon a general march of the whole nation to seek out some new plantation. The first difficulty we find them encountering is, how to get out of their country; so securely bounded as it was with hills and rivers, that it seemed to them rather a prison than a defence, and yet upon their return, being beaten by Cæsar, there was found, as he himself writes, and brought to him, table books written in Greek letters, wherein was recorded exactly the number of those that went forth who bore arms besides women and children." As the Greek characters were in use in Helvetia in the days of Cæsar, we may reasonably infer that the Greeks had been established in the country many years previously, or they could not have been, as it were, the scribes of the nation. The Greeks in ancient as in modern times, were a maritime people, first led to the sea perhaps by a deeply indented coast, and sea-girts island homes, the isles of Elishah of the old Testament. There is abundant evidence that Greek colonies were scattered in almost all parts of the Mediterranean Coast, and having reached its bounds, the same maritime people might reasonably pass the straits of Gibraltar to reach Gaul and Britain. But whether they went by land or sea, their presence in both at a remote period, may be considered to be fully established, and the evidence of the physical appearance of the inhabitants of Britain, especially, having been largely of Greek origin, is not to be gainsayed. In no country in Europe, except perhaps Greek proper, is an approach to the ideal Greek physiognomy more common than in Britain, and in no

country are the language and literature of Greek more commonly cultivated, and no European country has produced a poet nearer to the ancient Greek standard than Milton, the British Homer, who, concentrating with the quicksilver of his mind those grains of gold which our language has produced, fused them into a golden statue of himself in the Temple of Fame, as much larger than Homer's as is the area of England than Greece.

Could this have been done by a representative man in a nation altogether alien and foreign to the great Homer? Judging from our literature, we have more of the Greek element in our nation than France possesses; judging from her arts, she has a larger share of the Greek grace than we have.

Sammes says that "the Greek language or a dialect thereof altogether, was used in these islands until corrupted and grown out of use among the people; it was preserved only entire among the Druids, whom they cannot otherwise imagine could have that language, unless there had been some plantation of the people formerly in these parts. The Druids had the very same interests and used the same practice as the Roman clergy do in sticking fast to the ancient Latin tongue, and were very jealous of the Druids lest their learning and religion should be too much understood and divulged. It was accounted almost unlawful to divulge any of their mysteries, or to set down in writing, what they thought most safe and honourable to deliver by tradition. Their manner and expert way of fighting in chariots, after the ancient manner of Greece, and the countries adjoining when it was unknown to the Roman territories." page 76. Sammes goes on to quote Cæsar's Commentaries as follows: "In fighting, for the most part, the Britains employed their charioteers; first these drive about through all parts of the battle and fling darts, and with the terrible sight of horse and rattling noise of the wheels, they do most commonly break their ranks, and put them in disorder, and after they have once forced themselves within the troops of horsemen, they descend from their chariots and fight on foot. The chariot guiders in the meantime, withdraw a little from the hurry, and place themselves in such positions that if the other be overpowered by the number of enemies, they may readily and without hindrance retreat in safety." "Thus in their fights they perform the quick motion of horsemen, and have the steadiness of footmen. By daily practice and experience, so ready in their service, that on the descent of steep hills, they can stop their horses, although in full career, quickly turn short, and yet moderate their course, run along the spire pole and beam of their chariots, rest upon the yoke and harness of their horses, and from thence jump again with ease into their chariots." Sammes is clearly wrong, for the Druidical rites had evidently an origin in Phœnicia, and were probably the nucleus of Freemasonry, whose members are enjoined not to put its mysteries in writing. Their skill in the use of war chariots, was apparently also Phœnician or Canaanite. In the days of Joshua, the judge of Israel, the Canaanites had chariots of iron. Joshua xvii, 16. Sammes further says (page 77), "the expertness they had in their chariots, argues that they long had known the use of them, and consequently that the Greeks had been longer in their islands than is for the most part conceived, and yet not so long as to be the first planters; and that the nakedness and painting of some of them was rather a corruption and degenerating from the Greeks civility in these points, than the reason of their

name, for the Greeks are supposed to be here long before any such custom, and if at first the Greeks did find them naked, yet was it long before any such word as 'Brith' was used among them, which is not conjected by Mr. Cambden to be long before Cæsar's time."

"There were two different nations in Britain taken notice of by Cæsar, one of which proceeded out of Gaul, to which people, I think, Mr. Camden's antiquities only refer, who came out of a desire of conquest, and so planted themselves on the sea coasts. In other sorts, were they within the land of ancienter date and settlement, who acknowledged themselves to be derived from some of their neighbours, either because they were ignorant of their original, or perhaps thought, according as the Greeks did, that there was no greater honour than to be sprung from the earth they possessed, and so gave out, according to the usual custom of those times, that they were aborigines, so that the Greeks called them Ἀνήχστονες; and this people it is they imagine to be of Greek stock, and to be the primitive planters of this island, being as Cæsar and Tacitus write, they were of a different stature and complexion from those whom they gather to have come out of Gaul, besides their similitude of language and manners."

Another point of likeness between the Ancient Britons and Phœnicians was the custom of sacrificing their children to the Gods.

The Greeks are said to have first landed on the Islands of Anglesea and Man, which were the strongholds of the Druids, Anglesea being their metropolis, more especially their sanctuary, to which they retired on the invasion of Britain. The Southern Druids went to Anglesea, the Northern Druids to the Isle of Man, where the President resided, who held a great council annually. The Druids were driven out of Anglesey by King Cratilinth, A.D. 277, and sought refuge in the Isle of Man, which has been called the Mother of Cumri, in accordance with the expression Mon-Mam-Cumri. "The more northern Britons," says Sammes, page 83, "are supposed anciently to be called Cumero. I mean those Britons that lived in the inland parts of Britain, and not the Gaulish Britons. Sure I am this has given some reasons to think that the first Britons came out of Anglesey, anciently called Mona, and if they be of a Greek stock, that the Grecians first landed here; likewise there are those who have thought that these two islands are the same, which anciently were celebrated by the poets under the name of the Fortunate Island and the Elysian Fields." Isacius Tzetzes, a Greek author, in his "Notes on Lycophron," reports that they were among the Britons, and Homer by one is brought in to say they were on the coasts of Britain, and hence I will put down the following chief reasons, and so leave it to the reader to judge. "The Fortunate Islands lay in the Atlantic Sea, and so do these, with the rest of the British Islands. The Fortunate Islands were two, so are these and bigger Mona, one the nearer, the other the farther off. The Fortunate Islands were a type of the Elysian Fields, and are so called promiscuously, sometimes by one name, sometimes by another. They were said to be places of ease, pleasure, and rest from all labours to all who lived virtuously and regularly, as that the conversations of just and upright persons was the most valuable happiness. The strict life of the Druids might therefore render these two islands more valuable than others upon all the accounts aforesaid, as they were sequestered from the cares of the world, men of upright and moral conversation. Here were their general meetings; here they taught and discoursed of nothing but virtue and

piety. Their solemn assemblies were all concerning the principles of divinity, morality, the immortality of the soul, and the world to come; so that this conversation might well be esteemed for its retiredness and gravity to come nighest those ideas that the philosophers and poets—lovers of virtue—had of the rewards of another world. The Druids had that authority that they were made judges of controversies both in Britain and Gaul, to which esteem they never could have arrived unless they had been strict enquirers and searchers into the lives and manners of those they had admitted into their order, because these two islands were the fountains from which proceeded all their streams. No doubt but the greatest care was taken that they should be preserved pure and untainted, and this strict enquiry and severe examination of souls is supposed to be made by judges before their admission into the Elysian Field, as the ancient poets witness."

From the fact of this part of Britain being the stronghold of Druidism, and from the fact of Druidism being evidently of Phœnician origin, we may conclude that the Phœnicians at one time came in large numbers, so as to form a great part of the population of Britain. The name Mona, applied to the Isle of Man, is significant of monasticism; to live like the people of Mona was to be monastic. The Elysian Fields or Fortunate Islands were anciently full of shades and groves, Anglesey being called Pnis dowil, a dark and shady island, extensively planted by the Druids with woods and groves for the concealment of their idolatrous practices. If we turn to the Book of Judges, vi., we find Gideon cutting down his father's grove by the altar of Baal, and in 1 Kings, xviii., 19, the prophets of the groves are described as being four hundred in number. It is quite certain that Baal was worshipped in Britain, and that the custom of Beltin, preserved in Scotland to a late date, is a relic of it. The name under which Baal was worshipped was Belinus, or the sun-god, the equivalent of Apollo. Julius Capitolus informs us the god Belinus or Belenus by his priests declared that Maximimus should be overcome; his soldiers afterwards declaring that Apollo fought against them. He is called Belis by Herodion. Sammes is of opinion (page 130) that this is proved by the herb called by the Latins Apollinaris, being known to the Gauls by the name Belinuntia. The Phœnician Apollo was called Belus. According to Hesychus, βέλα in the Laconian dialect signifies the sun, and Ἀζέλιος means the same in the Cretic. Philobiblius, quoting Sanchoniathon, says he was called by the Phœnicians by the surname of Beltamen, that is the lord of the heavens. That the worship of this god was practised during the Roman occupation of Britain is clear from inscriptions discovered. Out of the ruins of an old town near Kirby Thore in Westmoreland a slab was dug inscribed: "Deo Belatucad Ro Lib Votu. M. Fecit Iolus," contracted from "Deo Belathucadro liberum votum fecit Iolus." To the god Belatucadrus, Iolus has made a free vow.

On an altar discovered in vaults underground, on the site of an ancient town near Ferby in Cumberland, was found: — "Belatu. cadro Jul. ci Vilis opt V. S. L. M," meaning "Belatucadro Julius civilis optio votum solvis libens merito." "Unto Belatucadrus Julius Civilis optio hath paid his vow right willingly." Another, "Deo Sancto Bela Tucadro Aurelius Diavota Ara E. X. voto posuit L L M M," meaning "Deo santo Belatucadro Aurelius Diatova Aram Ex voto posuit lubens lubens merito merito." "To the holy god Belatucadrus Aurelius Diatorus set up this altar most willingly and

most duly." A piece of a statue was found at Broughton in Westmoreland inscribed: "Sancto Deo Belatucadro," and is presumed to have been part of a statue of Belinus or Apollo. There were slight differences between the gods worshipped by the Phœnicians and Assyrians. The Phœnicians called Assyria Atur and the sun Cares. Hence Balatucadrus, signifying Apollo, the lord of the Assyrians; the Syrian or the Phœnicians Bel. I will now say a few words on the resemblance between the Greek and ancient British languages. The old Greeks used twenty-two letters as did the Britons, and both afterwards increased the number of their letters. Sammes (page 84) says: "The British letters agree exactly in sound with the Greek, as is most remarkable in c and g, not to include in d and a, which c and g are always pronounced by the Britons as χ and γ, and not as now they are before i and e, where c is pronounced like an s, and g like a j consonant. Of vowels the Britons had anciently six, now they have added a seventh, viz., a-w, but this relishes of the Teutonic. Their consonants, after the manner of the Greeks, are divided into semi-vocales and mutes, and these again into tenues, medias, and aspirates, which in the flexion of nouns and verbs pass into one another exactly after the Greek manner. R, in the beginning of words, is always with an aspirate, as it is in the Greek tongue, out of which observations in the British and Greek language I would note these things. First, that the Druids of Britain and Gaul, by the number of letters having only twenty-two, as may rationally be supposed after the manner of the older Greeks, came into Britain very early, when the Greeks had not as yet learnt the use of their other letters, or, if they had, notwithstanding, they were not frequently known among them. Secondly, the Druids using the same characters which were common in Greece in the time of Julius Cæsar, it appears that neither were they of so ancient a standing in this Island and Gaul as the first and primitive times of Greece, when the Greeks learnt their letters from the Phœnicians, and without doubt something nigh their character. Besides Pliny observes, out of an ancient inscription in the Greek tongue, that formerly the Grecians had very nigh the same characters with the Latins, if I be not mistaken did write an h instead of their aspiration, after the manner of the Phœnician, and if the Phœnicians did not themselves bring the use of letters and the number of them into Britain, but contented themselves with trading only hither, yet I am sure the Grecians had not only the first number of their letters from them, but characters also, and as may be very rationally, might bring them into this island after they had new-modelled them, and before they had added any new ones to them."

Sammes give a table of numerals, showing the resemblance between the Greek and British languages:

British.	Greek.	English.
Daw (Armori)	Ἕν	One
Daw (Armorican), Dow	Δύω	Two
Tri	Τρῶις	Three
Pedwar	Τέτταρες; Æol., Πέτταρες	Four.
Pump (Armo.) Pemp	Πέντε, Πέμπ'ὰ	Five
Cheuch (Armo.) Huech	Ἕξ	Six
Saith	Ἑπτὰ	Seven
With (Armo.) Eith	Ὀχτὼ	Eight
Naw	Ἐννέα	Nine
Deg	Δέκα	Ten
An ar deg	Ἕνδεκα	Eleven
Deuddeg	Δώδεκα	Twelve
Again	Εἴκοσι	Twenty
Cant	Ἑκατὸν	A hundred
Mil	Χιλιὰς	In the Latin, mille, a thousand
Mysdd	Μυριὰς	A million

The Greeks being a very definite

people, it is easy to believe how their numerals would influence those of the nations with whom they had intercourse. As these numerals have often been alleged to be of Roman origin, it is important to notice that some of them were carried by the Britons to Armorica, at a period shortly after the advent of the Romans. Of other words the following table contains a few of the more remarkable instances of correspondence, the old characters being preserved :

Brit.	Greek.	English.
Agos	Ἄτιος	A neighbour, or that which is near at hand
All	Ἄλλος	Another
Am	Ἀμφὶ	Round about of all sides or all parts
Amwyn	Ἀμύνω	To defend, or afford aid or assistance

An, is a particle privative as it is among the Greeks.

British.	Greek.	English.
Aoth	Ἄρκτος	A bear
Bloesy	Βλαισος	A stammerer
Brochi	Βρύχω	More cruel, hasty, or unruly
Cade	Καρτερὸς	Strong or valiant
Carthu	Καρὰροιν	To purge or clear
Casmai	Κῦμυσνα, ἡ Κόσμος	An ornament or garnish
Caul	Καυλὸς	Gruel or pottage
Cib	Κίβος	A shell or cabinet
Claiar	Χλεαρὸς	Warm
Cledy	Κληθρον	A rafter
Clod	Κληδὼγ	Praise or commendation
Cnithio	Κνήθω	To strike
Cnoi	Κνάω, ἢ Κνύθω	To bite or gnaw
Deysif	Δεήσις	A petition or quest
Dillis	Δῆλος	Manifest
Doz	Ὕδως	Water
Drysi	Δρῦς	An oak, or grove of trees
Giddo	Ιδιος	Proper or particular ones
Glin	Ὠλένη	A cubic
Etto	Ἔτι	Yet
Faelu	Φηλεῖν	To err
Fair	Φύσιον	Fairs
Flaw	Φλάω	A cut
Fozrioz, fur	Φώς ἢ φὼμος	A thief
Garan	Γέρανος	A crane
Geyleifio	Γιγγλιζειν	To tickle
Halen	Ἅλς Ἅλθ	Salt
Paul	Ηλιος, Ἄλιος, Æol.	The sun
Medd	Μίλ	Mead or Metheaglen
Mis	Μῶις, Æol.	A mouth
Moccio	Μοχίζω	To mock
Ni	Νῶϊ	We
Nyddu	Νήθω	To spin or weave
Pozthuvys	Ποξθμδις	A ferryman
Rhechayn	Ῥεζχειν	To sneeze or snort
Rhyn	Ῥὶν	A hill
Seban	Σήπων	Soap
Sirig	Σηεικὸν	Silk

A larger number of words might be quoted, but these will be sufficient to show a close connexion at one time between the Greeks and ancient Britons. It would be easy also to produce a table of Saxon and Greek words which show correspondence; and though they are fewer in number, yet of sufficient importance to show likewise an ancient connexion. Those who hold the theory of the Israelitish origin of the nations of Western Europe will consider that the presence of these Greek-like words in Anglo-Saxon vocabularies is an argument for the ancient intercourse between the Israelites and the Greeks For some of these words are so deeply incorporated with the Anglo-Saxon language that they appear to have entered it at an early stage of its formation. At the close of this paper I propose to say a few words on this subject. It seems natural that the British and Greeks should be anciently closely connected, if we see in their languages a resemblance of flexion and aspiration. This would probably occur when the language was young and when the people were pliable and eager to catch at Greek civilization. The larger number of Greek roots in British than in Anglo-Saxon language is certainly favourable to the theory which supposes the Anglo-Saxon element to be by no means a preponderating one amongst our population; had it been so, so many words of Phœnician and Greek origin would not have been found

in our language. From whence, then, were the Greeks, who were clearly the ancestors of a considerable part of the British and Western European nations? Attica, anciently termed Iona, and the Athenians, called by Homer Ioanes, show an affinity with the word Javan, the fourth son of Japhet, Gen. x., and Daniel ix. 22, in which latter book of the Bible Javan is used as a synonym for Greece. It was a shallow pretence of the ancient Athenians that Ionia was derived from Ion, son of Xuthus, son of Deucalion, and that they were aborigines Αυτο χονες, or those that have sprung out of the earth. Strabo, quoting Hecatæus, tells us that the Iones came out of Asia into Greece, which is certainly reasonable and in accordance with the earliest records in Genesis. The Iones appear to have been a widely scattered people—the builders of Cairns, monoliths, and other Titanic works in various parts of Europe: that they were probably civilized, so far as Greece was concerned, by Cadmus, son of Agenor, king of Phœnicia, who introduced the sixteen letters which have been called the Cadmean alphabet, and which I can prove to be all derived from and represented on natural objects. For allusions to Cadmus, see Ovid, Met. 3, fab. 1, 2, &c.; Herodot. 2, c. 49, b. 4, c. 147; Hygin, fab. 6, 76, 166, &c.; Diod. 1, &c.; Paus. 9, c. 5, &c.; Hesiod. Theog. v. 937, &c. Cadmus is supposed to have arrived in Greece 1,493 before the Christian era, which was the age of Moses. About this time the Phœnician or Canaanitish kingdoms were at their height, and their civilization began to make itself felt. Cecrops, who founded the kingdom and city of Athens, was apparently nearly contemporaneous with Cadmus. Before his time, according to St. Augustine (De civit Dei, l. 18, c. 10, and Thucydides lib. 1), the people of Greece were savage; probably they were ignorant of the art of writing, and consequently of reading. The successors of Cecrops governed Athens as kings for 400 years, until Codrus, who was the last king, after whose death the people elected their own rulers, under the title of Archontes or life governors, who ruled Athens for 316 years, after which decennial governors succeeded.

The civilization of Greece approached the culminating point at the time when that of Persia had reached it and Xerxes's expedition organised to oppose it, being overthrown, convinced the inhabitants of this little country of their relative strength, and fired their ambition, which only wanted a leader such as Alexander the Great to cleave for them a way to the capital of the world. The Greeks lost this empire almost as soon as it was gained, for it could not be sustained without a corresponding stability of character—a quality of mind in which the Greek is relatively deficient. He could dazzle, he could elevate, he could civilize, but he could not govern. There was about him a facility for change; his capital was Athens, of whose people it was said "for all the Athenians and strangers which were there spent their time in nothing else but either to tell or to hear some new thing" (Act xvii. 21). The Greeks in the days of Xerxes were powerful in their fleets, and at this time we may infer the trade was most active with the West, and probably with the Cassiterides or Tin Islands, Britain, considering that they subdued the Phœnician fleets and gradually absorbed their commerce with the West. One of their principal colonies was Marseilles in the South of France. The Council of Areopagus much resembled in some respects the Druidical body.

C. O. Groom Napier.

(To be continued.)

ON LEGISLATIVE PROTECTION TO THE BIRDS OF EUROPE.

In 1864, at the Bath meeting of the British Association, I produced ten Tables, showing the food and economic value of every British bird, as a plea for their legislative protection. Having published the paper in the form of a small book, I have had the satisfaction of receiving several letters of acknowledgment from Members of the Committee of the House of Commons, appointed to consider the Wild Birds' Bill of 1872, to the effect that my book had been the text book of their Committee in the matter.

In 1865 and 1866, I stated, in various letters to newspapers, that within two years after any extensive legislative protection was given to our insectivorous birds that our grain and fruit crops might be expected to be larger than had been hitherto known. And so, two years after the Bill of 1872 became law, crops of exceptionally large size and high quality were reaped. Reports from various districts spoke of a general increase in the number of insectivorous birds since the passing of the Act, and I have no doubt that the large crops of 1874 are in great part to be attributed to their friendly aid. With a view of sifting this matter, I beg to challenge all who are willing to join issue with me in this belief, feeling convinced that the array of facts which it will be possible to elicit cannot fail to be useful in that important science—Economic Natural History. Let farmers, gardeners, landowners, sportsmen, and naturalists accept this challenge.

If we look at Europe, we see migratory insectivorous birds, which have bred in Britain and northern parts of the Continent, pass the winter in southern climes, either of Europe, Northern Africa, or Western Asia, there to meet their death, particularly in Italy and France. Although these countries are peculiarly liable to the attack of insect scourges, yet the bird murderers are more numerous there than they were in England before the passing of the Act. The Act which has been passed in England appears to want amending, especially in the following respects. First, that there is no legislative protection given to the purely insectivorous birds which reside with us in winter; and, secondly, that there is no protection afforded to the eggs of insectivorous birds, whose legal guardians should be the owners or tenants of the soil on which they are found, without whose authority, in writing, no stranger should be permitted to take their nests.

In the spring of 1875, the Petition Committee of the German Parliament had a motion before it in favour of a project for obtaining international protection to birds, on the ground that the wholesale slaughter of them in the south of Europe was injurious to the interests of German agriculture. In consequence of this movement, I communicated with his Highness Prince Bismarck, and urged him to do all in his power to favour the movement, as it was a European question of vast importance. His Highness, by the command of his Government, caused the Minister of Finance and Agriculture to investigate into the truth of my arguments, and into the facts on which they were based, and, accordingly, Count Münster, the Imperial Ambassador, was desired by his Government to thank me for the information I afforded him. I have

had similar thanks from the Italian and Spanish Governments. I mention these facts to encourage my co-workers to co-operate together, with a view of making another great stir in favour of our feathered friends.

If we look at Sweden, Norway, Finland, and Lapland, we see birds of prey—the great agents for preventing propagation by diseased birds of game kinds—steadily diminishing in numbers under the relentless attacks of sportsmen and egg-collectors. Some legislation seemed called for in these northern countries. Accordingly, by an Act which came into operation on January 1, 1878, in Norway, a close time was provided for many birds and animals, and considerable restrictions imposed on foreign sportsmen. This paper, having been originally read before the British Association, at Bristol, and widely circulated at home and abroad, may have strengthened the hands of those who were disposed to follow the example of England in legislation.

At the time I wrote my paper, read at Bath, in 1864, I was in possession of a large number of facts relative to the food and economic value of birds found in Europe, but not known in Britain, especially as regards their food in their southern winter quarters. These facts are especially important at a time when German agriculturists are endeavouring to obtain international protection for birds. I will briefly summarize these facts.

I have arranged a catalogue of all the European birds not observed in the British Isles, have given their geographical distribution, economic value, and a comparative estimate of their form, color, and voice, which I have indicated in three degrees by the letters A, B, and C; A being the highest. By these letters in connection with the form and colour refer to the relative beauty of species in the family or order in the class to which they belong, and not to their beauty in the whole class of birds. I have also indicated their food during the various months of the year, and value as food to man. The importance of birds can hardly be overestimated. They exist in the greatest variety of situations of any class of animals, and in number of species are second only to fishes. Amongst vertebrata 14,000 has been given as the probable number of species or races of birds existant on the globe.

The number of birds killed in Europe is perhaps about 550, from these, when we deduct about 360 killed in the British Isles, we have 190 of European, but not British birds.

The vultures have a very high economic value in those parts of Europe where they abound. They feed principally on carrion and feculent matter, which, but for them, in countries where sanitary laws are little regarded, might deliver the land over to a reign of pestilence and death.

The Lammer gëyer (*Gypaetos barbatus*), the most noble and powerful of the European birds of prey, does not hesitate to attack living animals of large size, unlike the griffon and Egyptian vultures. The Alpine climber, on the brink of the precipice, has been attacked and driven over the rocky crags by the ferocious bird, who thus is enabled to feast undisturbed on his mangled remains. Its German name appropriately indicates its preference for lamb's flesh, but it often feeds on the ptarmigan, the fox, the marmot, or on carrion. Instances of its carrying away children are recorded. I am inclined to place it in the lowest rank from an economic point of view, but it must be remembered that it lessens the number of many animals which consume the scanty herbage of Alpine regions, which, if not kept in check, might render if less capable of sustaining the flocks

and herds of the mountaineers. The European falcons which are not found in Britain are of less importance, as they are more rare as species. The Norway jer (*Falco gyr-falco Norvegicus*, Wolley), and the Saker falcons (*Falco sacer*, Schlegel), in the countries where they are found in tolerable abundance, are very destructive to birds and the smaller quadrupeds, for they unite a large size with great activity and courage. They lessen, doubtless, considerably the supply of game; but are themselves among the choicest birds that can be used for the sport of falconry. This, in a comparatively civilized society, renders them the objects of protection. A trained falcon has a very high economic value. The lesser kestrel (*Falco cenchris*, Naum), is an especially useful bird in southern and central Europe, Syria, and Algeria, for it greatly lessens the number of those troublesome pests—locusts, grasshoppers, centipedes, scorpions, and tarantulas. The pale-chested harrier (*Falco pallidus*, Sykes), devours many poisonous reptiles as well as small gnawing quadrupeds, that frequent the plains of Russia, Hungary, and North Africa. But as many a duckling and smaller marsh bird falls a victim to this courageous harrier, I am induced to put it in the second rank from an economic point of view. It preys, however, greatly on locusts and other large insects. The imperial eagle (*Aquila imperialis*) and Bonnelli's eagle (*Aquila Bonnellii*, Tem.), are very destructive to hares, marmots, partridges, and grouse, but, like the golden eagle and the bearded vulture, do some good by lessening the number of those creatures which, although so suitable for man's food, yet when very numerous, are apt to exhaust the scanty supply of vegetable food in the districts they often inhabit. The black kite (*Milvus ater*, Brisson), feeds greatly on the carcases of animals which taint the air. They are of much value in Syria, Egypt, and Algeria; many fish stranded on the shores are devoured by them. The black-winged kite (*Elanus melanopterus*, Leach) is one of the principal enemies of the locust in some parts of Africa. It apparently delights in decapitating these insects; it destroys far more than it can devour.

The Lap owl (*Strix Laponica*), like the Eagle owl (*Strix bubo*,) is very formidable to the smaller birds of Arctic Europe and America. They possess the ferocity and courage of larger eagles and hawks. The smaller species of owl found in Europe, but not found in Britain, are useful birds on account of their insectivorous tastes and love of preying on the small rodents.

The azure-winged magpie (*Pica cyanea*, Wragler), is perhaps more insectivorous than the common magpie, and therefore of greater economic value. The Siberian jay (*Garulus infaustus*, Vieillot), from inhabiting wilder tracts of country where little cultivation of fruit is attempted, is less brought in contact with civilised man than the common jay. It is therefore of less consequence to man, its food nevertheless is largely insectivorous, but it does not hesitate to attack small birds and quadrupeds.

The great grey shrike (*Lanius meridionales*, Tem.) and the lesser grey shrike, (*Lanius minor*), are birds of great economic importance, they are probably races of the same species; the first inhabiting the South of Europe, N. Africa, Syria, and Palestine, and the second the more central or northern regions of Europe. They are both principally insectivorous, but devour small birds and mice, especially in the winter. The Swedish blue-throated warbler (*Sylvia caeruluca*, Pallas), like the Dutch race, (*S. cyanecula*) of this species, is one of the more important insectivorous warblers; its value as a destroyer of this class of animals is great, and it is a highly orna-

mental species, but its song has little to recommend it. The thrush, or greater nightingale, (*S. philomela*, Bech.), is likewise one of the most useful birds of its class from an economic point of view, and should be specially protected ; its excellence as a songster is only second to the common nightingale, (*Sylvia luscinia*). The bard warbler (*S. nisoria*, Bech.) is likewise a useful bird for a similar reason, and its great abundance in many parts of central Europe, renders it an important species.

The Sub-Alpine warbler, (*S. Alpina*, Bonelli), and the Sardinian warbler, (*S. melanocephala*, Lath.), and Bonelli's warbler, (*S. Bonellii*, Vieillot), are all useful little species, and like the birds to which we have just referred, should not be much molested in the breeding season. The aquatic warblers are especially valuable in districts where rice or other plants requiring great moisture are cultivated ; for they devour multitudes of small insects and mollusca. Of these I may specify the marsh warbler, (*S. palustris*, Bech.), and the aquatic warbler, (*S. aquatica*, Lath). The wheat-ears, of which five more species are found in Europe than in Britain, are likewise almost entirely insectivorous, and as they afford a choice repast, should not be molested in the breeding season. The red-throated pipit, (*Anthus cervinus*, and the water-pipit, (*A. spinoletta*, Deg.) feed principally on insects and mollusca. They eat also the seeds of marsh plants, but these are generally of little importance to man. The larks are an important genus in Europe, for the number of the species is great ; six being found in Europe that are not found in Britain, they feed variously on insects, worms, mollusca. green food and seeds. Their economic value generally is of the second rank, they should be by no means lessened too much in numbers, for although one or two species at particular seasons may devour a considerable portion of the produce of fields and gardens, yet they atone for this damage by still more extensive onslaughts on the inferior branches of the animal world. The tits of Europe, not found in the British Isles, are not so numerous as the last.

The sombre tit (*Parus lugubris*, Natt.), is a useful species in Greece and Hungary, where it, like our own blue tit, frequently removes the laroae of insects from beneath the buds of tree. The azure tit (*P. cyanus*, Pall.), has a similar habit ; it may be called the blue tit of Siberia.

The Penduline tit (*P. pendulinus*, Lin.), is exceedingly beneficial in the marsh lands of France and Russia, from the number of insects and small mollusca it consumes, like the azure tit, it is among the most beautiful and attractive of the small birds of Europe. The buntings are only entitled to an inferior rank when contrasted with the tits. They feed greatly on seeds. The black-headed bunting (*Emberiza melanocephala*, Scop.), during the spring, feeds greatly on the seeds of grass and weeds, but in summer it adopts a diet of which insects form a considerable portion. The meadow bunting (*E. cia*), like our yellow-hammer, is very destructive to grass and small seed crops, such as millet (and rape-seed). But this is only of consequence in particular districts. Its general food may be said to be grass-seed.

The serin finch (*Fringilla serinus*, Lin.), is similar in its food to the meadow bunting.

The Italian house sparrow (*Passer domesticus cis-Alpinus*), like the common house sparrow is omnivorous in its diet. In the neighbourhood of Turin thirty-five examinations of their stomachs, made by a correspondent of mine during the year 1860, yielded the following results :— Jan., Feb., green food, grain, berries, seeds, refuse ; March, seeds, insects ; April, May, green food, seeds, insects ; July, Aug., grain, green food, seeds, insects ; Dec., seeds, mollusca,

refuse. The Spanish sparrow (*P. salicarius*, Vieillot), is similar in its food. It will be seen that grain is several times mentioned as the food of this bird, but this is not always, as I have said in my little work on British birds, necessarily stolen from a crop, but may be often obtained from the undigested grains, so frequently observed in the droppings of quadrupeds.

The European woodpeckers, not found in Britain, are four in number; they are of the highest importance economically; if they sometimes devour a few berries, such as mountain-currants, cranberries, bilberries, and hazel-nuts, they atone for this by devouring multitudes of coleopterous, hymenopterous, and dipterous insects, some of which are very injurious to timber and fruit trees. The swallows found in Europe but not in Britain, are but three in number, and like those which we observe here, feed on insects which they take on the wing.

The Egyptian turtle dove (*Columba Egyptiaca*), like the species which visits us in summer, does great injury to the green crops of Northern Africa and Syria, but gives in return its excellent flesh. In some districts it lives very much among the palm-trees, hence its name palm-dove; the young shoots of the palm often afford it food.

The hazel grouse (*Tetrao bonasia*, Lin.), like its congeners found in the British isles, is much less injurious to agriculture, and has a higher economic value than the partridge and pheasant, unless we view these birds as important crops in themselves. In the breeding season it devours many insects.

The sand-grouse are of little value as food, although supposed by some writers to have been the quail of scripture. They are highly ornamental, however. Their food consists principally of the seed of wild plants, herbage and insects. The social plover (*Vanellus gregarius*, Vieillot), is an important species in Russia, in some districts of which it usurps the place of the common lapwing. It is good for the table. The rosy flamingo (*Phœnicopterus antiquorum*), is a great enemy to fry and small fish, but it devours many mollusca, which are generally of less importance to man. The willet (*Totanus semipalmatus*) although abundant in many parts of America, is but a rare and accidental visitor to Europe, in which country, however, it takes a similar place to that of the Dunlin and snipes of Britain. It feeds on the mollusca, insects, and worms, inhabiting the marshes, and affords excellent sport. The crested coot (*Fulica cristata*, Gmel.), in Southern Europe and Northern Africa, greatly represents the common species. It is omnivorous, but mollusca, fry, fish, and the seeds of aquatic plants, form its principal food. The gulls, of which four more species are found in Europe than in Britain, feed on fish, mollusca, and crustacea, mostly met with on the surface of the sea, or stranded on the shore. Two species of albatross have been killed in Europe, but their rarity renders them of no economic importance on its shores. The greater part of the year they are on the ocean. They subsist principally on floating mollusca, fish which swim near the surface, smaller aquatic fowl, exhausted land birds, or the carcasses of marine animals.

The little white-fronted goose (*Anser erythropus*, Newton and Lin.), is an important species in Norway, Russia, and Finland. It feeds, like our white-fronted beau and grey-legged geese, principally on grass, sedges, and other wild plants. The ducks found in Europe, but not occurring in Britain, are five in number. They may be divided into two classes. The first, feeding on plants principally, do not greatly attack mollusca or insects, and are excellent food. The second feed on fish, foy, fry, and mollusca, and are

not good for the table. Among the first we may mention the teals, the tufted duck, the marbled duck, the pochard, and the mallard. Among the second, the white-headed duck, the golden eyes, and the shieldrakes. The mergansers, which visit the British Isles, are still more destructive to fish and ovæ, and even more unsuited for the food of the civilized man. The pelicans in Eastern Europe are the greatest enemies known to the finny tribe, whether we consider their large size or inexhaustible voracity. They are clearly only to be tolerated in wild parts of the country; this they appear to understand, for a pelican island, or roosting, is generally far from the haunts of man. I have specified the species of most importance that are found in Europe, and not found in Britain, and will proceed to give a summary of their characters and value in accordance with the three degrees of qualities, which I have found so convenient in my published work, "The Food, Use and Beauty of British Birds." We have about 190 birds which have been obtained in Europe, but not in Britain. Of these, seventy-two, from their rarity, are of little importance in Europe; but thirty-eight species have a great economic value, which I have indicated in the catalogue by the letter A, as for example, the cinereous vulture, lesser kestrel, smaller owls, great grey shrike, thrush nightingale, Bonnelli's warbler, aquatic warbler, wheatear, red-throated pipit, penduline tit, woodpeckers, swallows, hazel and willow grouse, and spur-winged and social plovers. Twenty-two species have an economic value of the second degree; these should not be allowed to become too numerous, yet, in the interest of agriculture and society in general, should be in considerable numbers. These I have indicated by the letter B, as, for example, the pale-chested harrier, short-toed eagle, black kite, Siberian jay, red-breasted thrush, calandra and black larks, azure tit, and the yellow-headed bunting. The number of species I have placed in the third degree of value is eighteen; it is less than one-half of those in the first. These I have indicated by the letter *c*, as, for example, the bearded vulture, imperial eagle, Pallas's sea eagle, meadow bunting, serin finch, Italian house sparrow, Egyptian turtle dove, crested coot, gulls, white-headed duck, and pelicans. Only seven species are of much commercial importance as food: The Egyptian turtle, hazel grouse, willow grouse, spur-winged plover, snow goose, Greek partridge, and little white-fronted goose, being either imported or largely brought to market. But thirty are excellent for the table, among which I may mention the white-collared fly-catcher, red-breasted thrush, blue-throated warblers, barred warbler, Pennsylvanian pipit, calandra lark, meadow bunting, snow finch, rock sparrow, francolin, willet, Algerine cinereous shearwater, and marbled duck.

Forty-two, consisting of such birds as the vultures, falcons, eagles, owls, flamingos, shrikes, and coots, ducks that live exclusively on fish, terns, gulls, albatrosses, are scarcely fit for human food, being either very dry, hard and tough, or else otherwise unpleasant in flavour.

The lovers of the beautiful will be pleased to find at least fifty-three highly ornamental species, some of which, it is true, are accidental visitors to Europe. For example, the Norway jer falcon, bearded vulture, pale-chested harrier, imperial eagle, Arabian kite, lap owl, azure-winged magpie, blue-throated warbler, fantail, russet wheat ear, penduline tit, yellow-browed bunting, crimson-winged grosbeak, white-rumped woodpecker, wall creeper, pin-tailed sand grouse, sacred ibis, and Audouin's gull. And of species

excellent as songsters, he will find eleven. We may mention the thrush nightingale, red-breasted thrush, red-throated pipit, Calandra lark, and Serin finch. Some species of birds are such useful servants to man that they appear deserving of special protection at his hands. These I have indicated in my little book on "British Birds," by a letter *a* before the name of each bird. Amongst the European birds not found in Britain, the number I have placed in this class is forty-one. I may mention the cinereous vulture, lesser kestrel, black-winged kite, shrikes, fly-catchers, blue-throated warbler, thrush nightingale, Sub-Alpine warbler, wheat ear, pipits, penduline tit, woodpecker, Dalmatian nuthatch, swallows, hazel and willow grouse, spur-winged plover, and marbled duck.

The eggs of these birds should not be wantonly destroyed, for some in the perfect state afford valuable food for man; others are pre-eminent as songsters, while other classes, like the swallows and woodpeckers, effect an immense amount of good by the multitudes of insects they destroy; and a last class, like the birds of prey specified, remove pestiferous carrion, noxious reptiles or insect scourges from our neighbourhood.

As I said before, the birds that have been killed in Europe are about 550 species; of their respective degrees of economic value, attractive qualities, and value as food to man, we have the following numbers, according to my arrangement:—

Economic value of those found in Great Britain (*which we do not confine to their economic value in Britain*). Those of the greatest value, marked *a*, are 119, to which, if we add the European birds of the same value not observed in Britain, 38, we have a total of 157 species of the greatest economic value to man, or more than one-fourth of the birds of Europe.

Those of less economic value, marked *b*, number in Britain 90; to these, if we add the number in Britain of the same value, 22, we have a total of 112 found in Europe, and which are of secondary but important economic value as species of more than one-fifth of the whole.

Of those of least economic value, marked *c*, we have, of British birds, 84, of European, not found in Britain, 18, or a total of European birds of 102, or less than one-fifth.

Of species deserving of special protection in the countries where they are found, which I have marked in my work with the letter *a* before the name of each bird, we have found in Britain 90; found in Europe, but not in Britain, 40; together 110, or exactly one-fifth.

Of species excellent as songsters, we have, in Britain, 44; of European species not found in Britain, 11; together 55, or exactly one-tenth.

Of highly-ornamental species we have, in Britain, 137; in Europe, but not found in Britain, 53; together 190, or more than one-third.

Species important commercially as food in Britain, 38; found in Europe, but not in Britain, 7; together 45, or more than one-twelfth.

Species good for food, but unimportant commercially are, in Britain, 82; found in Europe, but not in Britain, 30; together 112, or more than one-fifth.

Species unfit for food, in Britain, are 98; found in Europe, but not in Britain, 42; together 140, or more than one-fourth.

C. O. Groom-Napier.

A CATALOGUE OF THE BIRDS THAT HAVE BEEN KILLED IN EUROPE, AND HAVE NOT AS YET OCCURRED IN THE BRITISH ISLES,

From a Utilitarian Point of View, with their Localities, Degree of Rarity, and Food, shewing their Comparative Value to the Agriculturist and Society in General.

The Economic Value, Beauty of Form, Colour, and Voice are indicated in three degrees, A, B, and C, A being the highest. Species deserving of special protection are marked here (*a*) before the name of each bird. The observations on the food of the various birds are made in different countries, mostly where the birds are abundant.

a. Sociable vulture. *Vultur auricularis*, Daudin. Europe, extremely rare; killed once or twice. Mountains of Nubia and East Central and Southern Africa. Gregarious. Ec. value Africa A. Beauty of form and colour B. Food: Africa, Feb. carrion. May, carrion.

a. Cinereous vulture. *Vultur cinereus*, Lin. Europe East Central, Spain, the Pyrenees and Apennines, Egypt and Arabia. Ec. value Europe, B. Beauty of form and colour B. Somewhat migratory. Food: Europe, Mar. carrion. Ap. carrion. Dec. live animals.

Bearded vulture. *Gypaëtos barbatus*, Cuv. Pyrenees, Sardinia, Siberia, the Tyrol, Egypt, Syria, and Africa Ec. value, Europe, C. Beauty of form and colour A. Food: Europe, Feb. live animals. Mar. young lambs, kids. Egypt, May, Jy., young antelopes.

Norway jer falcon. *Falco gyrfalco Norvegicus*, Wolley. Lapland, Norway, Russia, resident. Beauty of form and colour A, when trained for the chaise. Food: Norway, Feb. Mar. small birds and quadrupeds. Ju. Jy. small birds and quadrupeds.

Saker falcon. *Falco sacer*, Schlegel. Turkey, Russia, Syria, and Tartary. Ec. value Russia, C. when trained for the chase. Migratory. Beauty of form and colour A. Food: Russia, May, small quadrupeds.

Lanner falcon. *Falco lanarius*, Schlegel. This is probably a variety of the preceding. Russia, Syria, and Egypt. Beauty of form and colour A. Accidental in Western Europe. Food: Ju. Egypt birds.

Eleonora falcon. *Falco Eleonoræ*, Géné. Greece, Turkey, Sardinia. Beauty of form and colour B. Food: Greece, Ap. May, small birds and insects.

a. Lesser kestrel. *Falco cenchris*, Naum. Southern and Central Europe, Spain, Greece, Syria, and Algeria. Ec. value, A. Beauty of form and colour A. Food: Algeria, Jan. Feb. Mar. insects, scorpions, centipedes. Hungary, Ju. Jy. Au. insects, small reptiles.

Little red-billed hawk. *Falco gabar*, Lath. Turkey, North and South Africa. Beauty of form and colour B. Food: Algeria, Ju. large beetles and young birds.

Levant sparrow-hawk. *Falco Gurneyi*, Bree. Probably a variety of the next. Greece and Syria. Beauty of form and colour B.

Calcutta sparrow-hawk. *Falco badius*, Gmel. Hindostan, Syria. Beauty of form and colour B. Food: Syria, May, insects, small birds.

Pale-chested harrier. *Falco pallidus*, Sykes. Russia, Hungary, Spain, and Africa. Beauty of form and colour A. Ec. value B. Hungary, May, Ju. young birds, reptiles, and small quadrupeds.

Imperial eagle. *Aquila imperialis*, Cuv. Hungary, Egypt, Turkey, Russia, Spain, Algeria. A rare bird generally. Ec. value C. Beauty of form and colour A. Food: Algeria, Jan. Mar. birds and small animals. Hungary, May, birds and small animals.

Bonelli's eagle. *Aquila Bonellii*, Tem. Greece, Italy, Sardinia, South of France, Spain, and India. Ec. value C. Beauty of form and colour B. Food: Italy, birds and animals. Spain, birds and animals.

Booted eagle. *Aquila pennatus*, Brehm. South of France, Spain, Greece, India, and Algeria. Ec. value, B. Beauty of form and colour B. An uncommon bird. Food: Algeria, May, Ju. Jy. insects, reptiles, small birds.

Tawney eagle. *Aquila nævioides*, Cuv. Crimea, North Africa, and India. Food: Algeria, spring, birds and small quadrupeds.

Pallas's sea eagle. *Aquila leucorypha*, Pallas. Crimea and India. Ec. value, C. Food: Crimea, May, Ju. fish.

Bald eagle. *Aquila leucocephala*, Pallas. Rare and accidental in most parts of Europe. Said to breed in Norway. The emblem of the United States, where it is common. Food: U. S., Mar. fish, aquatic fowl.

a. Short-toed eagle. *Aquila brachydactyta*, Meyer. South and centre of France, Spain, Syria, Algeria, and India. Ec. value, B. Food: Spain, May, insects, birds, and lizards. Algeria, Ju. Jy. Au. small animals.

Long-legged buzzard. *Buteo rufinus*, Kaup, Russia, Syria, India, Egypt, and Algeria. Food: India, Ju., insects, reptiles, small birds, and reptiles.

African buzzard. *Buteo tachardus*, Vicillot, Russia, North Africa, and Japan. Food: May, insects and reptiles.

a. Black kite. *Milous ater*, Brisson. Switzerland, Greece, East and South of France, Algeria, Spain, Japan and North Africa. Ec. value, B. Beauty of form and colour B. Food: Algeria, Mar., Ap., May, carrion fish. Syria, Ju., carrion.

Arabian kite. *Milvus parasiticus*, Kaup, Greece, Africa, and Syria. Ec. value B. Beauty of form and colour A. Food: Egypt, birds, quadrupeds, fish, and carrion.

a. Black-winged kite. *Elanus melanopterus*, Lath. Spain, Germany, Greece, India, North Africa. Beauty of form and colour A. Food: Africa, large insects, locusts, and grasshoppers.

Ural owl. *Strix uralensis*. Pallas, Lapland, Russia, Siberia, and Hungary. Ec. value. B. Beauty of form and colour B. Food, Russia, May, rats and small quadrupeds.

Lap owl. *Strix lapponica*, Retzius. Lapland, Greenland, Labrador, Arctic America. Beauty of form and colour A Food: Lapland, Ju., hares and grouse.

a. Least European sparrow owl. *Strix pusilla*, Daudin. Russia, Lapland. Beauty of form and colour B. Food: Lapland, Ju., insects, small birds.

Egyptian eared owl. *Strix asc calaphus*, Vicillot. Sardinia, Sicily, Syria, Egypt, India and Algeria. Beauty of form and colour B. Food: Mar., India, quadrupeds and birds.

Black Jackdaw. *Corvus monedula nigra*, Frisch. This is probably a variety of the common jackdaw. South of France and Spain. Beauty of form and colour C.

Azure-winged magpie. *Pica cyanea*, Wagler. Russia, Spain, China, and Japan. Ec. value Spain, A. Beauty of form and colour A. Food: Spain, Jan., Feb., Mar., insects. Jy., Aug., Sept., insects, fruits.

Black-headed jay. *Garrulus melanocephalus*, Géné. This is probably a variety of the common jay. Syria, Algeria, and Russia. Beauty

of form and colour A. Food : Jy., berries and insects.

Siberian jay. *Garrulus Infaustus*, Vicillot. Lapland, Russia, Sweden, Norway, Siberia. Ec. value Lapland, B. Beauty of form and colour B. Food : Norway, Ju., insects, small birds, and quadrupeds. Oct., small birds and quadrupeds.

Alpine chough. *Pyrrhocorax pyrrhocorax*, Tem. Alps, Pyrenees, Greece, Spain. Beauty of form and colour B. Ec. value Spain, B. Food : Spain, May, Ju., insects, carrion, mollusca, and fish. Au , Sept., grain, fruits.

Sardinian starling. *Sturnus unicolor*, Marmora. Sardinia, Algeria. This is perhaps a race of the common starling.

a. Great grey shrike. *Lanius meridionalis*, Tem. Italy, Greece, Syria, Palestine. Ec. value, Italy, A. Beauty of form and colour B. Food: Italy, summer insects, young birds.

a. Lesser grey shrike. *Lanius minor*, Gmel. Greece, Turkey, Spain, Holland, and Germany. Ec. value, Spain, A. Beauty of form and colour B. Food : Greece, Ju., insects, birds. Spain, Au., Sept., Spain, insects small birds.

a. Masked shrike. *Lanius personatus*, Tem. Greece, Egypt, Syria, Arabia, and Algeria. Beauty of form and colour B. Food : Greece, May, insects.

a. Hooded shrike. *L. tchagra*, Le Vaillant. Spain, South of France, N. and S. Africa, and Palestine. Beauty of form and colour B. Food : South Africa, May, insects.

a. White-collared flycatcher. *Muscicapa albicollis*, Tem. Hungary, Greece, and Algeria. Ec. value, A. Beauty of form and colour A. Food: France May, Ju., Jy., insects. Excellent eating.

Red-breasted thrush. *Turdus migratorius*, Lin. Accidental visitor in Europe. Generally distributed in N. America. Ec. value, America, B. Beauty of form, colour, and voice B. Food : Boston, Jan., insects, berries, grain, mollusca. Mar., insects, seed, mollusca. May, insects, fruits. Aug., Sept., Oct., berries, fruits, insects. It is very good for the table.

Black-throated thrush. *Turdus atrogularis*, Tem Hungary Germany, Russia, and Siberia. Beauty of form, colour, and voice B. Food: Russia, May, insects.

Naumann's thrush. *Turdus Naumannii*. Tem. Hungary, Germany, Siberia, and Japan. Beauty of form and colour B.

Siberian thrush. *T. Sibiricus*, Gmel. Russia rarely, more common in Siberia and Japan. Beauty of form and colour B.

Pale thrush. *Turdus pallidus*. A rare and accidental visitor to Europe, like the last named more common in Siberia.

Blue thrush. *Petrocincla cyanea*, Gould. Pyrenees, Spain, Turkey, Greece, Switzerland, and the Tyrol, Syria and Algeria. Beauty of form, colour and voice B. Food : Tyrol, May, Ju. insects, Greece, Au. insects good food.

a. Dusky ixos. *Ixos obscurus*, Tem. Spain and North Africa. Beauty of form and colour C ; of voice A. Food: Algeria, May, insects.

Guldenstadt's redstart. *Sylvia erythrogastra*, Mühle. Eastern Europe. Beauty of form and colour B ; of song C.

Grey redstart. *S. Cairii*, Gerbe, Probably a race of *Sylvia tithys*. Alps. Food : Ju. insects.

a. Swedish blue-throated warbler. *S. Caeruluca*, Pallas. Norway, Sweden, Lapland, Russia, and India. This is a race of *S. Cyanecula*. Beauty of form and colour A ; of voice C. Food : Sweden, May, Ju., Jy., insects. Good food.

Ruby-throated warbler. *S. Calliope*, Mühle. Russia, Crimea, Siberia, and India. Beauty of form, colour and voice B.

a. Thrush nightingale: *S. Philo*

mela, Bech. This is probably a large variety of the common nightingale. Sweden, Germany, Switzerland, Poland, Hungary, Russia, and Persia. Ec. value, A. Beauty of form and colour C; of voice A. Food: Germany, May, Ju., insects.

Barred warbler. *Sylvia nisoria*, Bech. Germany, Hungary, Russia, and N. Italy. Beauty of form, colour and voice B; Ec. value, B. Food: Germany, May, Ju., Jy., insects and fruits.

Ruppell's warbler. *Sylvia Ruppellii*. Tem. Greece, Palestine, Egypt. Beauty of form and colour B.

a. Sub-Alpine warbler. *Sylvia sub-Alpina*, Bonelli. Italy, Dalmatia, Russia, Greece, and South of France. Ec. value, A. Beauty of form, colour and voice B. Food: S. of France, Ju., insects.

a. Sardinian warbler. *Sylvia melanocephala*, Lath. Spain, Greece, Sardinia, North Italy, and France. Ec. value, A. Beauty of form and colour B; of voice C. Food: Ap., May, insects.

Spectacled warbler. *Sylvia conspicillata*, Marmora. Sicily, Spain, Greece, and Algeria. Ec. value, A. Beauty of form and colour A; of voice B. Food: May, Ju., insects.

Marmora's warbler. *Sylvia Sarda*, Marmora, Sardinia, Sicily, and South of France. Beauty of form and colour B; of voice C. Food: Sardinia, Ju., insects.

a. Bonelli's warbler. *Sylvia Bonelli*, Vieillot. South of France, Spain, Italy, Switzerland, Algeria. Ec. value, A. Beauty of form and colour B; of voice C. Food: France, Ju., Jy., Au., insects. Pretty good eating.

Olive-tree warbler. *Sylvia olivetorum*, Strickland. Greece, Palestine, and Algeria. Beauty of form and colour B. Food: Palestine, Jy., insects, mollusca.

Olivaceous warbler. *Sylvia elaica*, Mühle. Greece, Palestine, Turkey. Beauty of form and colour B; of song C. Food: Greece, May, Ju., insects, mollusca.

Vieillot's willow warbler. *Sylvia icterina*. Probably a variety of S. Hypolais, Lath. France, Sardinia, and Germany. Beauty of form, colour and song B.

Black-throated warbler. *Sylvia virens*, Lath. N. America; taken on Heligoland. Ec. value, America, A. Beauty of form and colour A; of voice C. Food: America, May, Ju., Jy., insects.

a Marsh warbler. *Sylvia palustris*, Bech. Central Europe, Russia, Italy, Holland, and France. Ec. value, A. Beauty of form and colour C; of voice, A. Food: Germany, May, Au., Sep., insects, mollusca. Eatable.

Booted reed warbler. *Sylvia scita*. Russia, Siberia, and Greece. Beauty of form and colour C.

a. Aquatic warbler. *Sylvia aquatica*, Lath. France, Germany, Holland, and Algeria. Ec. value, A. Beauty of form and colour B; of song C. Food: France, May, Ju., insects, mollusca.

Moustached warbler. *Sylvia melanopogen*, Tem. Italy, France, and Greece. Beauty of form and colour C. Food: Italy, Sep., insects, mollusca.

Fan-tailed warbler. *Sylvia cisticola*, Tem. Spain, Portugal, Sicily, Sardinia, and France. Ec. value, A. Beauty of form and colour B; of song C. Food: Italy, Ap., May, Ju., insects, mollusca.

Cetti's warbler. *Sylvia Cetti*, Marmora, France, Spain, Sardinia, Egypt and Algeria. Beauty of form, colour and song C. Food: Algeria May, insects, mollusca.

River warbler. *Sylvia fluviatilis*, Meyer and Wolf. Shores of the Danube, Ec. value, A. Beauty of form, colour and song, C. Food: insects, mollusca.

Pallas's locustelle. *Sylvia certhiola*. Tem. Siberia and Heligoland, Beauty of form and colour B. a very rare bird.

Mountain accentor. *Accentor Montanellus*, Pallas, Hungary, Siberia and Russia. Beauty of form

and colour B. Food: Russia, Ju., insects.

a. Black wheatear. *Saxicola leucura.* K. B. France, Spain, Sardinia, Greece and Algeria, Ec. value. Algeria, A. Beauty of form and colour B; of voice C. Food: Au., Sep., Algeria, insects, mollusca. Excellent eating.

a. Russet Wheatear. *Saxicola Stapazina.* Tem. France, Greece, Italy, Algeria and Syria. Ec. value, Algeria, A. Beauty of form and colour A; of voice. C. Food: Algeria, May, Ju., Dec., insects, mollusca. Excellent eating.

a. Black eared wheatear. *Saxicola aurita,* Tem, Greece, Italy, Sardinia, France and Algeria. Ec. value, A. Beauty of form and colour A. Probably a race of the preceding. Food: Africa Oct., Nov., Dec. insects, mollusca. Excellent eating.

a. Pied wheatear. *Saxicola leucomela,* Tem. Africa, Russia and Greece. Ec. value. Russia, A. Beauty of form and colour A. Food: Russia Mar, Ap., insects and mollusca. Excellent food for man.

Menetries' wheatear. *Saxicola saltatrix.* K. B. Russia, Egypt, Greece and Palestine. Ec. value, Russia, A. Beauty of form and colour B; of song C. Food: Egypt, May, Ju.. insects. Good for eating.

Yellow-headed wagtail. *Motacilla citreola* Pallas, Russia, Siberia. Beauty of form and colour B; of voice C. Food: Siberia, insects.

a. Red-throated pipit. *Anthus cervinus,* K. and B. Algeria, Lapland, Sweden, Norway and Russia. Ec. value, Lapland B. Beauty of form and colour C; of voice B. Food: Lapland, May, insects and seeds. Jy. insects, seeds, Germany, Aug. insects, seeds. Good food.

a. Water pipit. *Anthus spinoletta,* Deg. The Alps, Tyrol, Spain, Italy and Bulgaria. Beauty of form and colour B; of voice C. Food: Spain, May, insects, mollusca. Alps, Ju., insects, mollusca. Good eating.

Bifasciated lark. *Alauda bifasciata,* Lich, Spain, France, India, N. Africa. Beauty of form and colour B; of song C. Food; Algeria, May, Au., insects, seeds.

Dupont's lark. *Alauda Duponti,* Vieillot, Spain N. Africa. Beauty of form and colour B; of voice B. Food: Algeria, Sep. insects, seeds.

Desert lark. *A. Isabellina,* Tem. Greece, Spain, Portugal, Syria and Algeria. Beauty of form and colour C; of voice B. Food: May, Algeria, insects.

Black lark. *A. Tartarica,* Pallas. Rarely in W. Europe, common on the Wolga. Beauty of form and colour C. Food: May, Ju., Jy., insects, mollusca, seeds. Good eating

Calandra lark. *A. Calandra,* Briss, Russia, Algeria, Italy, the Peninsula, Greece and Syria. Ec. value, Algeria. B. Beauty of form, colour and song B. Food: Algeria, Jan., Feb., Ap. seeds, insects, May, Ju., insects. Good eating.

Siberian lark. *A. Sibirica,* Gmel, Russia, Siberia, and Tartary. Beauty of form and colour B. Food: Wolga, Jy. Au. insects, seeds. Good eating.

Sombre tit. *Parus lugubris,* Natt. Hungary, Greece, Russia. Beauty of form, colour and song C. Food: Greece, Ju., insects.

Siberian tit. *P. Sibiricus,* Gmel, Lapland and Russia. Beauty of form and colour B; of song C. Food: May, Lapland, insects.

Azure tit. *P. cyanus,* Pallas. Rarely, Sweden, Germany, Russia. Siberia. Ec. value, Russia. A. of voice C. Food: Russia, Ap. May, insects. Ju., Jy., insects, fruits.

a. Penduline tit. *P. pendulinus,* Lin. Russia, Central Europe, Italy and France. Ec. value, France and Russia, A. Beauty of form and colour A; of voice C. Food: France, Mar., Ap., May, insects, mollusca. Jy., Au., Sep., insects, mollusca.

Black-headed bunting. *Emberiza melanocephala*, Scop. Germany, Greece, Italy, Syria. Ec. value, B. Beauty of form and colour B; of voice C. Food: Spring, seeds of grass and weeds principally. Summer insects, seeds. Excellent eating.

Marsh bunting. *E. palustris*, Savi. Italy and France, but probably a race of Schœniculus, Lin. Beauty of form, colour and voice, C. Food: Ap. May, aquatic plants, insects, mollusca.

Pine bunting. *E. pityornis*. Pallas. Turkey and Siberia. Beauty of form and colour, B. Food: Siberia, May, seeds, aquatic plants and insects.

Cretzschmaer's bunting. *E. cæsia*, Cretz. Greece, Egypt, and Palestine. Beauty of form and colour, B; of voice, C. Food: May, Ju. Palestine, insects.

Striolated bunting. *E. striolata*, Rüppell. Spain, Egypt, and Africa. A doubtful visitor to Europe. Beauty of form and colour B.

Meadow bunting. *E. cia*, Lin. South of France, Spain, S. Germany, Syria, and N. Africa. Ec. value, C. Beauty of form and colour B; of voice C. It is sometimes very destructive in millet fields. Food: France, Jan. Feb. seeds, Algeria, May, Ju. insects, seeds. Jy. Au. seeds, insects. Is excellent eating

Rustic bunting. *E. rustica*, Pallas. Russia. Beauty of form and colour B; of voice C.

Yellow-headed bunting. *E. Aureola.* Pallas. Russia, Siberia, Ec. value, B. Beauty of form and colour A. Food: Siberia, May, seeds.

Yellow-browed bunting. *E. chrysophrys*, Pallas. Rare and accidental in Europe. Beauty of form and colour B.

Little bunting. *E. pusilla*, Pallas. Russia, Siberia, China, Heligoland, and Italy. Beauty of form and colour B.

Scarlet bullfinch. *Pyrrhula erithrina*, Tem. Scandinavia, Russia, Siberia. Beauty of form and colour A; of song C. Food: Russia, Ju. seeds.

Rosy bullfinch. *P. rosea*, Tem. Siberia, Hungary. Beauty of form and colour A. Food: Siberia, May, seeds.

Desert-trumpeter bullfinch. *P. githaginea*, Tem. Italy, Africa. Beauty of form and colour A; of voice C. Food: Algeria, May, seeds.

Crimson-winged grosbeak. *Fringilla coccothraustes phœnicoptera*, Bree. Caucasus, Russia, Turkey. A rare species. Beauty of form and colour A.

Citril finch. *F. Citronella*, Lin. Switzerland, Italy, Greece, the South of France and Algeria. Ec. value, France, B. Beauty of form and colour B; of song B. Food: Switzerland Ap. May, seeds, insects. France Jy. Au. Sep. seeds. Eaten in France.

Snow finch. *F. nivalis*, Briss. Switzerland, Pyrenees, Apennines, and the Caucasus. Ec. value, Alps, B. Beauty of form and colour B; of voice C. Food: Switzerland, May, seeds of mountain plants, Nov. Dec. seeds of the pine and other plants. Good eating.

Alpine serin finch. *F. pusilla*, Gmel. Russia, and the Caucasus. Beauty of form and colour B.

Holboell's redpole. *F. Holboellii*, Brehm. Greenland, accidental in France. Beauty of form and colour A.

Rock sparrow. *Passer petronia*, Schlegel. Spain, France, Hungary, Turkey, Greece, Palestine, and Affghanistan. Ec. value, Spain, C. Beauty of form and colour B; of song C. Food: Jan. Feb. Mar. Spain, grain, seeds, and berries. Ap. May, Ju. Jy. insects and fruits. Good eating.

Italian house sparrow. *P. domesticus cisalpinus*, Schlegel. This is probably only a variety of the common house sparrow. Italy, Sicily, France, and Syria. Ec. value, C. Beauty of form and colour C Food: Italy, Jan. Feb. green food,

grain, berries, seeds, insects. Jy. Au. grain, seeds, green food, insects. Dec. seeds, mollusca, refuse. Pretty good as food.

Spanish sparrows. *P. salicarius*, Vieill. Spain, Italy, Algeria, Ec value, Spain C. Beauty of form and colour B ; of voice C. Food : Spain, Jan. and Mar. grain, green food, insects. Ju. Jy. insects, fruits. Nov. Dec. grain, seeds, refuse. Eatable.

a. Grey-headed green woodpecker. *Picus canus*, Gmel. Norway, Sweden, Switzerland, Russia, and Hungary. Ec. value, Hungary, A. Beauty of form and colour B ; of voice C. Food : Hungary, insects in summer, occasionally fruits.

a. White-rumped woodpecker. *P. leuconotus*, Meyer. Sweden, Lapland, Russia, Poland, Pomerania, Germany, Ec. value, Russia A. Beauty of form and colour A. Food : Russia, insects. Like the last, not often eaten.

a. Middle-spotted woodpecker. *P. medius*, Lin. France, Spain, Italy, Ec. value, France A. Beauty of form and colour A ; of voice C. Food : France, insects.

a. Three-toed woodpecker. *P. tridactylus*, Lin. Sweden, Lapland, and Russia. Ec. value, Lapland A. Food : Lapland, insects.

a. Dalmatian nuthatch. *Sitta Syriaca*, Eher. Dalmatia, Turkey, Greece, India, and Syria. Ec. Syria, value, A. Beauty of form and colour, C. Food : Syria, insects and nuts, principally the first. This may be a race of the common European nuthatch.

Wall creeper. *Tichodroma muraria*, Ill. Switzerland, Spain, Italy, Greece, and India. Beauty of form and colour A. Food : insects. Good eating.

Blue cheek bee-eater. *Merops Persica.* Greece, Palestine, Algeria, Persia, and Egypt. Ec. value A. Beauty of form and colour A ; of voice C. Food : Algeria, May, Ju., Jy., insects. Eaten by man ; excellent.

Black and white kingfisher. *Alcedo rudis*, Lin. Turkey, Greece, Italy, Spain, Egypt and Palestine. Beauty of form and colour B. Food : Egypt, insects, small fish.

a. Oriental chimney swallow. *Hirundo rustica*, var. Savigni, Bree. This is an Oriental race of the common swallow. Switzerland, Sardinia, Egypt, and Siberia. Ec. value, A. Beauty of form and colour A. Food : insects.

a. Rufous swallow. *H. daurica*, Lin. Greece, Italy, France, and Syria. Ec. value. Syria, A. Beauty of form and colour A. Food : insects.

a. Crag swallow, *H. rupestris*, Scop. Alps, Pyrenees, Syria, Egypt, N. Africa, and India. Ec. value A. Beauty of form and colour B. Food : insects.

Egyptian turtledove. *Columba Egyptiaca*, Lath. Egypt, Syria, Africa, and Greece. Ec. value, Syria, C. Beauty of form and colour A. Food : Syria, seeds of weeds and green crops. Excellent eating.

Japan turtledove. *C. gelastis*, Tem. This is probably a race of C. turtur. Accidental in Europe ; found in China and Japan. Ec. value. Beauty of form and colour.

a. Hazel grouse. *Tetrao bonasia*, Lin. Norway, Sweden, Germany, Switzerland, France, Italy, and Siberia. Ec. value. Sweden B. Beauty of form and colour A. Food : Sweden Jan., Feb., leaves and seeds of trees. Ju., Jy., insects, seeds, herbage. Excellent eating.

a. Willow grouse. *T. salicetti*, Tem. Norway, Sweden, Lapland, and N. America. Ec. value, Sweden B. Beauty of form and colour A. Food : Ap., May, catkins and buds of willows and birch. Ju., Jy., herbage, leaves, and insects. Excellent food, and are important in commerce. This is probably a variety of the common ptarmigan.

Pintailed sand grouse. *Pterocles alchata*, Step. Spain, Pyrenees, S. France, Algeria, Egypt, Persia, and India. Ec. value, B. Beauty of

form and colour A. Food : Algeria, May, seeds of wild plants. Flesh dry and of little value.

Sand grouse *P. arenarius*, Tem. Spain, Sicily, Germany, Russia, Algeria, and India. Ec. value B. Beauty of form and colour A. Food : India, Jy., desert seeds and plants. Flesh dry and of little value.

Caucasian snow partridge. *Tetraogallus Caucasicus*, Grey. Greece, Armenia, Caucasus. Ec. value, Caucasus A. Beauty of form and colour A. Food : Asia, Jan., Feb., the dung of animals, berries, and refuse. Jy., Au., Sep., seeds of wild plants. Excellent eating.

a. Francolin. *Perdix francolinus*, Lath. Nearly extinct in Europe ; formerly found in Cyprus, Sicily, Sardinia, Italy, and Greece, more common in India. Beauty of form and colour A. Food : India, Ju., seeds of wild plants and herbage. Excellent eating.

Greek partridge. *P. Græca*, Gesner. Greece, Italy, Switzerland, Turkey, and France ; and P. chukar ; probably a race of this species is found also in India. Beauty of form and colour. Good eating.

Pallas pratincole. *Glareola Pallasii*, Bruck. Greece, Hungary, Russia. Beauty of form and colour B. This is a variety of the collared pratincole.

Ruffed bustard. *Otis hubara*, Gmel. Spain, Greece, Turkey, Germany, Algeria, and Egypt ; a straggler in Europe. Beauty of form and colour B. Food : Algeria, May, Ju., Jy., reptiles, desert herbages, refuse. Somewhat dry as food.

a. Spur-winged plover *Charadrius spinosus*, Lin. Greece, Russia, Turkey, Italy ; abundant in Africa and India. Ec. value, A. Beauty of form and colour C. Food : Africa, mollusca, herbage, worms. Is said to pick the teeth of the crocodile. Eatable.

Black-headed plover. *C. Ægyptius*, Hassq, Egypt ; and very rare in Europe. Beauty of form and colour B. Food : Egypt, mollusca, and worms. This bird is also said to pick the teeth of the crocodile.

Asiatic plover. *C. Asiaticus*, Lin, Russia, Tartary. Beauty of form and colour B.

a. Social plover. *Vanellus gregarius*, Vieillot. Accidental in Hungary, Germany, Italy, and France ; common in Russia and the Punjaub. Beauty of form and colour B. Food : Russia, Ju., mollusca, worms, and insects. Pretty good eating.

Siberian crane. *Grus leucogerana*, Pallas. A doubtful visitor to Europe. Siberia, Persia, China, and Japan. Beauty of form and colour A. Food : Siberia reptiles, fish, mollusca.

Balearic crane. *G. pavonina*, Bris. A doubtful visitor to Europe. Africa. Beauty of form and colour A. Food : insects, mollusca, fish, and reptiles. Good eating.

Rosy flamingo. *Phœnicopterus antiquorum*, Bp. Spain, Italy, and France ; breeds in Africa. Ec. value, C. Beauty of form and colour A. Food : Africa, mollusca, and fish ; it is also a great enemy to fry.

Sacred ibis. *Ibis religiosa*, Cuv. A doubtful visitor to Europe ; common in Egypt, Western Africa, and the Cape. Beauty of form and colour A. Food : Egypt, fish, insects, mollusca, and reptiles. Fishy in taste.

Slender-billed curlew. *Numenius tenuirostris*, Vieillot. Sicily, Greece, and Italy. This may be a race of the whimbrel.

Marsh sandpiper. *Totanus stagnalis*, Bech. Russia, Greece ; rarely France, Germany, Africa, Algeria, Egypt. Ec. value, Russia C. Beauty of form and colour B. Food : Russia, Ju., mollusca, worms. Good food.

Willet. *T. semipalmatus*. Tem. America ; an accidental visitor to Europe, A. Beauty of form and colour B. Food : America, mollusca, insects, and worms. Good food.

Terek godwit. *Limosa terek*, Tem. Archangel, Wolga, Japan; an accidental visitor even in most parts of Russia. Ec. value, Siberia A. Beauty of form and colour B. Food: Archangel Ju, insects, mollusca, and worms.

Crested coot. *Fulica cristata*, Gmel., Africa, Spain, France, and Italy. Ec. value, C. Beauty of form and colour C. Food: Africa, fish, young birds, mollusca, and seeds of aquatic plants. Fishy. This is probably a race of the common coot.

Allied tern. *Sterna affinis*, Tem. Greece, Africa, Asia, and Syria. Ec. value, C. Beauty of form and colour A. Food: Red Sea, fish and mollusca.

Audonin's gull. *Larus Audouinii*, Payrodeau. Greece, Sardinia, Africa, Syria. Beauty of form and colour A Food: Sardinia, crustacea and fish. Not eaten.

White-eyed gull. *L. Leucopthalmus*, Licht., Greece. Beauty of form and colour B.

Slender-billed gull. *L. tenuirostris*, Tem. France; Italy rarely. Beauty of form and colour A. Food: France, mollusca and fish.

Mediterranean black-headed gull. *L. Melanocephalus*, Natt., Dalmatia, Algeria, Greece. Beauty of form and colour A. Food: Dalmatia, May, mollusca, fish, crustacea.

Algerian cinereous shearwater. *Puffinus cinereus*, Cuv., Algeria, Greece, and Dalmatia. Beauty of form and colour B. Food: crustacea, mollusca, and fish.

Wandering albatross. *Diomedea exulans*, Lin., Atlantic and Pacific Oceans; has been killed on the European coasts. Beauty of form and colour A. Food: fish, mollusca, floating carcases, and smaller birds. Flesh hard and fishy.

Yellow-nosed albatross. *D. chlororhyncos*, Gmel. The oceans. Beauty of form and colour A. Food: fish, mollusca, carcases of animals and smaller birds.

Snow goose. *Anser hyperboreus*, Pallas. Artic, America Asia, and Europe; visits Germany and Greece rarely. Ec. value, A. Beauty of form and colour A. Food: America, aquatic plants, crustacea, and berries. Excellent food.

Little white-fronted goose. *A. erythropus*, Newton and Lin., Lapland, Sweden, Norway, and Russia. Ec. value, Norway and Sweden, A. Beauty of form and colour B. Food: Sweden, water plants. Excellent food.

Clucking teal. *Anas glocitans*, Pallas. Siberia, Wolga, China, and Japan. Beauty and form of colour, A. Food: Siberia, aquatic plants.

Falcated teal. *A. falcata*, Pallas. Siberia, accidental in E. Europe. Beauty of form and colour A. Food: Siberia, aquatic plants. Excellent eating.

Marbled duck. *A. marmorata*, Tem. Algeria, Syria, Spain, and Greece. Beauty of form and colour B. Food: Algeria, seeds of aquatic plants, mollusca, and insects. Eaten.

White-headed duck. *A. mersa*, Pallas. Russia, Finland, rare and accidental in other parts of Europe; Algeria Ec. value, C. Beauty of form and colour B. Food: Russia, crustacea, mollusca, and fish.

Iceland Duck. *A. Barrowii*, Gmel. This is the Iceland race of the common golden eye. Ec. value, Iceland B. Beauty of form and color B. Food: Iceland, Ju., crustacea, mollusca, and fish.

Dalmatian pelican. *Pelicanus crispus*, Bruch. Africa, Hungary, Wolga, Greece, Syria, and China. Ec. value, C. Beauty of form and color B. Food: fish. Not eatable.

White pelican. *P. onocratalus*, Lin. Greece, Africa, Russia, Asia, Sicily. Beauty of form and colour B. Food: fish.

Little cormorant. *Carbo pygmæus*, Tem. Russia, Hungary, Greece, Syria, and Egypt. Ec. value, C. Beauty of form and color B. Food: fish. Not eaten.

ON NATURAL MAGNETS AS AFFECTING THE HUMAN BODY.

SOME years ago I experienced a peculiar feeling somewhat resembling cramp, or a low voltaic shock on handling a mineral a little larger than a walnut. It consists of quartz, blende, and copper pyrites with a little iron pyrites. Several friends also experienced the same feeling. One in particular observed that the action of the heart was much lowered and the pulse was correspondingly depressed after holding it about ten minutes. Although I have made numerous researches, I have not been able to find any recorded observations of similar effects produced on handling these minerals, which are supposed to be neutral bodies, and neither negative nor positive electrically. I am not prepared to assume that the influence they exert is magnetic or voltaic, still it is analagous in some respects with these phenomena. Most scientific authorities deny that simple magnets have any effect on the human body. In opposition to this, I may mention that I possess a specimen of magnetite found in the iron mountain district of Missouri, U.S., which on being held for some-time in the hand produces a feeling of exhaustion and a tingling sensation in both arms; at least this is the case with myself and some other persons who have tried it. It possesses considerable magnetic power, although I have often seen more powerful loadstones.

A friend of mine, Dr. J. Simms, of New York, who has visited this district and procured there a piece of magnetite, about twenty pounds weight, tells me that he experiences, on handling this loadstone, a sense of exhilaration throughout the whole system, similar to that felt on taking strong alcoholic stimulants, which is followed by great relaxation or exhaustion, after a few hours have elapsed. This loadstone will lift eight pounds. At the smelting works where this ore was reduced to the metallic state the workmen—who prepared some powerful loadstones for exhibition at the State agricultural show—were much exhausted and declined to work at it without intermission. The surface ore in this district is highly magnetic and extends down ten inches.

In the neighbourhood of these mines, explosions almost annually occur, which are locally believed to arise from the earth's current, affecting the large masses of magnetic ore, buried in the earth in the vicinity, or what in my opinion appears more probable, that electric discharges from the atmosphere induce the explosions, in a manner somewhat analagous to the interrupted magnetism of the artificial electro-magnetic machine.

The ore at the surface, which is so highly magnetic, may acquire this property from being electrified by the atmosphere, the electric current not being sufficiently powerful to influence ore deeply buried. This magnetite frequently yields 72 per cent. of pure iron.

C. O. GROOM NAPIER.

WHOLESALE DEALING WITH THE LAND IN CYPRUS, IN 1878, AND NOTES ON ITS ARCHÆOLOGY AND NATURAL HISTORY.

BY A TURKISH PASHA.

(*Continued from page* 176.)

Russian.—"I have been translating a long letter in Turkish from a Pasha, who is now coasting round Cyprus in a steam yacht; it is full of interesting details of the Colonial prospects of the island, I will translate to you part of it."

Englishman.—"I have heard of this before. A Pasha who has been much in England has contracted to buy a large part of the Island at a small price, and is selling the land to a company now being formed, at a moderate profit. The transaction, however, is so large, that, considering he took the land in lieu of securities, of little value at present, and that he is selling the land for cash, he will realise a million sterling."

Russian.—"This is no secret to me. Well, I will read. The Pasha says:—'I arrived off Cyprus in the month of June. I had private intelligence that the Island was on the eve of being transferred to England, and made my arrangements for immense tracts of land at nominal rates. As soon as the announcement of the transfer was made, I thought of forming a company to take the land at a profit, but still at nominal rates, thinking that this would be much better for me at my advanced age. Accordingly my friends have been so kind as to enter into my scheme, and have most liberally given me their confidence. I expect the land will be worth in ten years, when I am in my grave, from five to ten times what they have paid for it. By the request of a scientific friend in London, who studies anthropology, and who believes that among the women of Cyprus the nearest approach to the Greek ideal of beauty is to be found, I have procured a young woman for the purpose of bringing her to England, in the interests of science. I sent a messenger through the island, saying that I wanted to engage as servant a young woman of good character, with features like a photograph of an ancient Greek marble female head, which a Jewish friend had given me. About forty young women came with their friends in answer to this notification, but only one was like the photograph. She was, in my opinion, very beautiful, and would serve as a model for an artist, both in face and in figure. Her father was a Mussulman, and would only part with her on condition that I bought her, according to the old custom. He demanded for her £500. As I could not get her in any other way, I consented to the principle of purchase; but, by appearing indifferent in the matter, her father eventually consented to take £50 for her. Accordingly she came on board the yacht, where she now is. I made her attendant to my lady housekeeper, and companion to the female servant. I at once gave her her freedom, a privilege she did not appreciate. She at first cried very much, but after a fortnight she was cheerful. She is five feet five inches high, and has a very deep chest, full bust, but small waist. She is eighteen years of age, quite illiterate, but clever in floss silk and other embroidery on cloth. She is

occupied about four hours daily in learning to write and read English. She shows a great talent in forming the letters. She seems learning to write well after half-a-dozen lessons, and a very good disposition, and is as pleasing in manner as she is beautiful. As she is not accustomed to male society, I do not allow her to be alone with or to speak to any man except those that I introduce her to. When she comes to England I intend to send her to a school for about four years, after she has been seen by the scientific men of London. Afterwards, if she is disposed, I will send her back to the East as a missionary. She wishes to be baptised, to be of the same religion as the great Empress of the East. She plays in a pleasing manner on a kind of guitar. In order that she may preserve her spirit, I have given her as an attendant a young girl of fifteen, of Cyprus. I will get her an English servant as soon as she arrives in England. Her father was a gentleman of a small estate, about 500 sheep, and 100 head of cattle. She was his shepherdess, and was born and brought up in the mountains. She has been on the top of Mount Olympus. Her hair is properly speaking black, but she has been in the habit of dyeing it with henna. However, I have made her give up all these disfigurements, and she now sees that these habits are unsuitable to an educated woman, which she wishes to become. She has a courageous high spirit, and I am quite hopeful she will become a useful Christian woman.

For the gratification of my English friend, I am making a collection of the antiquities and natural productions of Cyprus. I have employed two Germans, a Greek, and an Englishman, to help me in this and other matters. They have collected about 300 articles of ancient and modern pottery, mostly of the so-called Etruscan type. Some have inscriptions in Greek and Phœnician. One of my sailors, when roaming among some ruins, discovered a marble slab, which my Italian physician declares has on it a Phœnician inscription. No one that has seen it can decipher it. It seems of great antiquity, and appears to have been taken from some temple of the sun, for it has on it a figure of Baal, rudely sculptured. This appears to be the most important object we have obtained. It is carefully rolled in matting, and is now on board the yacht. We use the dredge constantly on the coast, and have fished up some good pottery, bronze helmets, fragments of bronze, two pairs of gold earrings, and some gold jewellery, ancient Greek, but of little intrinsic value. One of my men bought, for its weight, in English sovereigns, a small gold image of an animal, with very long legs and a tufted tail; it may be of the style, my German says, of the gold mice, which some think were jerboas, which the five Lords of the Philistines sent back with the ark, as is mentioned in 1. Samuel. This little thing cost £14, but I am told it might fetch £100. I have obtained from the natives about 300 ancient gold coins of 130 different patterns, mostly in very good preservation. One Greek merchant sold me all his collection, made with great care during forty years. I have likewise obtained about 2,000 silver and copper coins, of about 400 different patterns. Many of the gold and silver coins are said to be Phœnician, quite undescribed; they have, however, but little in the way of inscription. I have obtained at great cost, over a hundred engraved seals and ancient cameos, mostly each in its original gold settings; I have given too much money—£900—for them; but they have been collected, I am told, for about a hundred years by a family here. They have mostly inscriptions in Archaic, Greek, or Phœni-

cian. I also purchased a silver ingot, which had been fished up at sea, weighing twenty-five pounds. It is inscribed with Phœnician characters, possibly indicating the mine where it was obtained. The silver is quite free from copper. I bought it at four shillings per ounce, after my German had made an assay. As regards Natural History, I have already obtained the skins of 120 species of birds, 1,500 species of insects, mostly beetles and flies; but in the wet season and spring I hope to obtain a large number of butterflies and moths. I should have mentioned that I obtained five gold necklaces and a golden crown, very thin metal, weighing only fourteen ounces, and having spikes or points sticking up, such as are seen in some of the old crowned portraits on Roman coins. This is called unique; I had to give £100 for it. It exactly fits my own head. I also got a golden girdle of thick twisted wire, which I am told is a Celtic torque; its ends are ornamented with bull's heads. This weighed thirty ounces, and cost £4 per ounce. I have formed a large collection of the commercial products of the vegetable kingdom of this Island, and hope that by next summer I shall have a large collection of dried plants; but not beginning to collect till the end of June, most of the flowers were withered. My German, who is a good botanist, says he can see at once that the Island will afford a great many new species, probably hundreds; a great variety of crocuses, lilies, and other bulbous plants. (This report was very long, and entered into the details of the various lands, and concluded by expressing most sanguine anticipations of the advantages of Cyprus to colonists from the West.)

GEOLOGICAL SOCIETY OF LONDON.

THE Quarterly Journal of the Geological Society for February and May, 1878, contains:

"The Invertebrate Fauna of the Lower Carboniferous or Calciferous Sandstone Series of the Edinburgh Neighbourhood," by R. Etheridge, jun. This went over nearly new ground, and contains plates figuring thirty-three species, principally mollusca.

"Discovery of Silurian Beds in Teesdale," by W. Gunn, a short physico-geological paper.

"On Possible Displacements of the Earth's Axis of Figure produced by Elevations and Depressions of her Surface," by the Rev. Professor J. F. Twisden. A short technical, mathematical paper founded on a passage in Mr. Evans' presidential address.

"On Terminal Curvature of the South-Western Counties," by J. E. Usher. A short paper having reference to the ice sculpture of the counties.

"On the Cretaceous Dentalidæ," by J. S. Gardner. A short paper giving forty-eight figures of greensand and gault species.

"Notes on Fossil Plants discovered in Grinnell-land by Captain W. H. Feilden," by Professor Oswald Heer. A coal bed of between 25ft. and 30ft. had been found. Captain Feilden's collection contained twenty-six species, of which eighteen were from the miocene deposits of the Arctic zone, which stamped the formation as miocene. The Grinnell-land Flora approached the Miocene of Northern Spitzbergen. Taxodium distichum miocænum found fossil at Grinnell, now requires the climate of the United States and Mexico for its life. The spruce also was found, and numerous other fossil plants identical with those found at Spitzbergen, but such as will not grow there at present. In the discussion which followed the reading of the paper, reference was made to the alteration in the position of the Pole being the cause of alterations in the Flora.

"On Points of Similarity between Zeolitic and Siliceous Incrustations of Recent Formation by Thermal and those observed in Amygdaloid and other altered Volcanic Rocks," by Professor A. Daubrée. An important mineralogical

paper, in which in the recent formation of minerals suggests that in older rocks.

"On the Sand-worn Stones from New Zealand," by J. D. Enys. A short paper, with cuts, showing the curious sculpture of the stone by natural sand-blast, analogous to that now used for etching on glass.

"On the Superficial Geology of British Columbia," by George Mercer Dawson. A long paper illustrated with special reference to ice action.

"On *Argillornis longipennis*, a large bird of flight from the Eocene of Sheppey." The remains were very scanty, and were contrasted with similar bones of the albatross. The fossil bird was, however, much larger.

"On the Circinate Vernation, Fructification, and Varieties of Sphenopteris Affinis, and on Staphylopteris, Peachii of Etheridge and Balfour, a genus of plants new to British rocks." By C. W. Peach, A.L.S.

"On the Pre-Cambrian Rocks of Bangor," by Professor T. M. Hughes. A very short paper, with "Notes on the Microscopic Structure of the Rocks," by Professor Bonney.

"On some Pre-Cambrian Rocks in Carnarvonshire," by H. Hicks. A very short paper.

The annual meeting took place on February 15th, Professor P. M. Duncan in the chair. The presidential address was a *resumé* of the Paleontographical work of the year.

"Additional Notes on Dimetian and Pebidian Rocks of Pembrokeshire," by H. Hicks.

"On the Building-up of White's-sinter Terraces, Rotomàtiànà, New Zealand," by the Rev. R. Abbay. A short paper on geyser deposits.

"On the Stratigraphical Position of the Corals of the Lias of Mid and England and Wales," by Robt. F. Tomes, describes many species, some new, with one plate.

"On Foraminifera from Pleistocene Beds in Ischia" by Ernest Vanden Broeck and A. W. Waters. Little more than a list of species.

"The Pre-Carboniferous Rocks of Charnwood Forest," part 2, by the Rev. E. Hill and the Rev. T. Bonnay. A long and important paper, with plates. "The Moffat series," by Charles Lapworth, an extremely long and important memoir, with sections, lists of fossils, and review of the Lithology.

"Notes on the Physical Geography of the Upper Punjaub," by A. B. Wynne. A long and important paper.

"Notes of Two Skulls of Crocodilia from Wealdon and Purbeck," with plate, by G. W. Hulk.

"On Glacial Deposits of West Cheshire and Fauna of Cheshire Drift" by W. Shone, gives a long table of drift shells, contributed to by the leading authorities.

"Notes on a Crocodilian Jaw from the Corallian Rocks of Weymouth," by E. T. Newton, with plate.

"On the Deer of the European Pliocene and Miocene Strata," by W. B. Dawkins. A valuable paper; but perhaps the knowledge of the subject is too scanty to warrant all the specific distinctions arrived at.

"On the Influence of the Advent of a Higher Form of Life in Modifying the Structure of an Older Form." An evolutionary paper with special reference to the development of Saurians.

ROYAL ASTRONOMICAL SOCIETY.

THE Royal Astronomical Society's monthly notices for March and April contain the following papers:—

"Galileo's Trial before the Inquisition in the light of recent researches," by Mr. Sedley Taylor. It is usually thought that Galileo committed contempt of court by writing in favour of the Copernican doctrinein 1632, when he had in 1616 been inhibited by the Inquisition from doing so. It is now found to be very doubtful whether such inhibition ever existed, and it appears probable that the allegation of it at the trial was maintained on forged documents. The evidence is carefully weighed in the paper.

"On Hansen's terms of long period in the lunar theory," by E. Neison, Esq. A paper appreciable only by specialists. The same may be said of the following papers:—

"On the telescopic observations of the transit of Venus, 1874, made in the expedition of the British Government, and on the conclusions to be deduced from those observations" by Mr. Stone.

"On certain groups of stars with common proper motions" by Professor Safford.

"Ephemeris for physical observations of Jupiter" by Mr. Marth.

"Observations of occultations of stars by the moon, and phenomena of Jupiter's satellites, made at the Royal Observatory, Greenwich, in the year 1877."

"On Mr. Stone's note in the January number of the monthly notices" by Mr. Proctor.

"Observations of shooting stars in 1877" by Mr. Denning.

"Radiant points deduced from the paths of 4,143 shooting stars observed by the members of the Italian Meteoric Association in the year 1872" by the same.

"On the determination of the axial position of Mars with respect to the earth at any epoch" by Mr Proctor.

"On the proper motion in right ascension of Draconis" by Mr. Downing.

"On a new variable in the constellation Ara" by Mr. Tebbutt.

"Improvements in a solar spectroscope made by Mr. Grubb for Professor Young" by Mr. Erck.

"On a combined position and setting circle to be used with large Newtonian reflectors" by the same.

"On the variable star U Geminorum" by Mr. Knott.

"Note on the mean Solar Parallax as derived from the observations of the recent transit of Venus" by Capt. Tupman.

"The luminous spot on Mercury in transit" by Mr. Jenkins.

"Early transits of Mercury" by Mr. Johnson.

"A comparison of the observations of contact of Venus with the sun's limb in the transit of 1874, Dec. 8, made at the Royal Observatory, Cape of Good Hope, with the corresponding observations made at the stations in the Parliamentary report, and a discussion of the results" by Mr. Stone.

"Photography at the least refrangible end of the solar spectrum" by Captain Abney.

"On the duration of meteor showers" by Mr. Greg.

"On the solution by trial of the Lambert's theorem in Olbey's method for the computation of parabolic orbits" by Mr. Bosanquet.

"Observations of the companion of a Canis Minoris with the transit circle of the U. S. Naval Observatory" by Mr. Eastman.

"English observations of the satellites of Mars, 1877. Note on the table, p. 70 of vol. ii. *Dun Echt*, observatory publications" by Lord Lindsay.

AN AFGHAN IN IRELAND.

THE following letter was written by an Irishman, in Cork, to his brother, in London, and has been given by the brother for publication:

"Sept. 24, 1878.

"DEAR TOM,—I am off for the East. That confounded Government won't give me an appointment in Cyprus, so I must do the best I can for myself; so I have joined the Hibernian Corps of Afghans, and will be off to the East on the 1st of November. Do you think Mr. W. E. G. would be kind enough to pay for my outfit? I would do all I could to help him in Afghanistan, for as long as I have a drop of blood left in my body I am willing to spill it for the defence of my country. It is often said, 'England's difficulty is Ireland's opportunity.' Let us arm and play the man for our holy Pope; and, as Russia hates England, let us love and help her, as by so doing we may achieve our own independence—if we do not, we will perish gloriously. I send you twelve stamps to drink success to my holy mission in the best Irish whiskey, not 'L. L.' I want nothing to do with the Lord-Lieutenant; may he go to the blazes. He might, by the mere stroke of his pen, have got me a good appointment in Cyprus. But I have not much time for vituperation, for I must stick to my duties. I have pawned my watch, and have bought a Remington rifle and 500 bullets, one each for 500 John Bulls. But I have not enough to pay my passage to India. I must work it, unless I can get help from W. E. G. I will write once more before I go. Love from mother and sisters.

"Yours affectionately,

"F. O.

"P.S.—Our M.P. has just written to say that, if I stop at Cyprus and use his name, I may get something, after all, so I shall do so, and if I do not succeed I must go on to Afghanistan.—F. O."

VEGETARIANISM THE CURE FOR CONSUMPTION.

CONSUMPTION, or phthisis, is a blood-poisoning, originally induced through the inhalation of impure air, which developes tubercular disease of the lungs. This is the original source of consumption; but when established in families even pure air, which might have prevented it before its establishment, will not cure it. Consumption, or phthisis, has analogy with a furnace, the combustion in which is intensified by a strong draught of air, induced by a bellows or other appliance, which produces an intense heat. The very intensity of the heat tends sooner to wear out the walls of the furnace than a lower degree of heat or slower rate of combustion. Man's bodily existence is prolonged in a degree which bears an exact relation inversely to the rapidity and intensity of his consumption of those elements necessary to life of which he partakes. The problem of maintaining life is, therefore, solved by supplying the elements necessary for life.

Phthisis is a consumption of the fuel of life more rapid than its supply. If these principles are admitted to be true, and I think those who have studied the human body will, for the most part, admit them to be true, and some of them, they will say, are even generally acknowledged to be true, we are brought to consider how far it is possible to prevent or cure the blood-poisoning, or phthisis. Sulphur, in its volatile combinations, is a great enemy to animal as to plant life, and it is only the very vigorous that can sustain health in air contaminated with more than a trace of it.

Those who would cultivate human health must, therefore, nourish the body, and at the same time introduce into it as little as possible that can induce disease. The four elements most necessary for the support of the body are oxygen, nitrogen, hydrogen, and carbon; but although this is a great fact, yet their complex combinations give to each its own properties and effects on the human body. A very slight difference of proportion of the combination of these elements being all the difference between a wholesome food and a virulent poison, it thus remains to us "to refuse the evil and choose the good." The tendency of food mainly derived from the flesh of animals is to promote a feverish state of body, heat of blood, tendency to perspiration, restlessness rather than energy, and consequently all those diseases which proceed from cold, which is generally the offspring of checked perspiration, cancer, tumour, most eruptive diseases, fevers of all kinds, and *phthisis*. The limits of this paper do not admit of a dissertation on the great principles of disease of which phthisis is so striking an example; but for the sake of clearness it will be necessary, from time to time, to enter a little into a consideration of these great principles. A well-selected vegetable diet, from its not exciting the mucous membrane of divers parts of the human body, tends to discourage thirst, and, consequently, prevents drunkenness, perspiration, and fever, and many of those diseases which spring from checked perspiration and are accompanied by fever.

Having become convinced more than twenty years ago of the truth of these principles, the author was led to think that phthisis was the result of impure living in the majority of cases, and was in the majority of cases a curable malady. He was

induced by these convictions to endeavour to apply nature's preventive and nature's cure for phthisis—vegetarianism. The following cases which fell under the author's notice seem worth mentioning :—

Case A. A young lady of twenty-eight, married, and the mother of three children, much emaciated, was supposed to be in a very advanced stage of phthisis. She weighed only 84lbs. She had been in the habit of taking a pint of strong ale daily, and about 1lb. of meat. She had strength to walk daily short distances, but was much troubled with spitting of blood, cough, expectoration of pus, and other consumptive symptoms. Her husband, who was a slight acquaintance of the author's, induced her, by his advice. to take an oil bath daily. The bath resembled a slipper-bath, and was of tepid water, on the surface of which a pint of vegetable oil (rape oil) was poured. The body absorbed daily about a quarter of this oil. Her diet was of maccaroni, bread, haricot bean, cabbage, rice, and bean tea, which consists of haricot beans boiled for about one hour and a-half. She gained rapidly in flesh. In the course of six weeks she had increased 8lbs. ; in the course of four months, 18lbs ; in nine months, 28lbs. ; and in twelve months, 31lbs., which brought her to a healthy weight for her height. By this time she had almost lost her cough, and was considered by herself and husband cured. The sole medicine she used was about a quart of the pure juice of watercress, taken in spoonfuls, three times a day.

Having given some time and reflection to the subject of the oil-bath, I contrived a dress of caoutchouc cloth, which, fitting tightly round the legs and moderately so round the body, admitted of being filled with oil, which was thus brought in contact with the body of the patient suffering from emaciation for one hour daily. In the case of a boy of eight, about nine ounces were absorbed through the pores of the skin in two applications. This oil cure, accompanied by the vegetarian diet, is, according to twenty cases which came under my own observation, a specific, so far as any remedy can be, for consumption, either of the lungs or other parts of the body involving great emaciation.

I hold that the healthy action of the skin tends to decrease consumption, and, as a means of stimulating it, washing the body once or twice a week with a weak solution of permanganate of potash or Condy's fluid was found very useful. This had a tendency to destroy the unwholesomeness of the exhalations, which, in phthisis and other diseases, tend to increase the disease of the patient. After such washing, the patient's body should be freely anointed with oil, which will prevent taking cold, and will otherwise stimulate and warm the body. A salt-water bath, either of marine salts or of natural sea-water, is likewise very useful.

The success of the first case under this treatment induced me to advise the friends of several other sufferers to adopt similar means of cure.

Case B. Thirty-four years old, sister of A., like her of a very consumptive family, had spent about half her fortune in getting change of air and medical advice, when she came to see her sister, hearing of her recovery. It required little persuasion to induce her to adopt the oil baths and vegetarian diet, and weekly bath of permanganate of potash solution. She increased twenty pounds in weight in six months ; lost a cough from which she had suffered about five years, and was otherwise completely cured of what had been pronounced an incurable phthisis.

Case C. A brother of the same lady, had less marked, but still decided symptoms of phthisis; he was cured in nine months.

Case D. The mother of the above was considered to be in a deep decline, and was cured by adopting the same treatment, in the course of eight months. The author instructed a Dr. Mecklewörth, a German physician in his system, and Dr. M. has sent him about forty cases of successful cure at Moscow. Dr. Mecklewörth's brother-in-law, Doctor Herman Swegelhörst, a Swedish medical man, has had an even greater number of successful cases, among which may be mentioned that of a young lady, aged eighteen, who resided with her parents in Stockholm, and who after having been eighteen months in a consumption, Dr. Swegelhörst was called in; he placed her in a weak permanganate bath which lasted one minute. She was then dried and put in a bath of pure olive oil, in which she was allowed to remain a quarter of an hour, she immediately absorbed about a pint of it, and was able to take a small quantity of lentil porridge. This was her diet twice a day, but she had three other meals in which fruit, vegetable, soup and bread were included. In three months she was able to go out and take the fresh air as it was summer, and by winter she was able to take sleighing and skating exercise. One of Dr. Swegelhörst's pupils has applied the system with great success in the United States, and is of opinion that if the treatment were universally adopted, consumption would become a disease of the rarest occurrence. Dr Swegelhörst causes his consumptive patients to breathe on a slide of glass, which when magnified shows traces of matter to which no doubt the ill odour of the breath of consumptive patients is due. The breath of the patients when cured, shows nothing peculiar when preserved on a glass slide and magnified.

The tendency of modern civilised society, is to promote the increase of the consumption of butcher's meat, it being a popular belief that bodily vigour cannot be sustained without an extensive consumption of, or at any rate, a small consumption of this sort of food. The tendency of a flesh diet is to excite and stimulate to an unhealthy extent, not merely the surface of the body, but the vital organs, and to promote hemorrhage, fever, liability to cold, irritability of the mucous membrane of the stomach, and consequently dyspepsia, thirst and drunkenness, cancer, tumour and every sort of eruptive disease, undue corpulence, dysentery and diarrhœa, depending of course on the constitutional susceptibilities of the individual and other attendant circumstances. If we cast our eyes on the majority of the populations of great towns, particularly of London, and enquire into their food, we find that their wages cannot possibly supply them with an adequate proportion of animal food to nourish them fully at its present high price in England. Hence when they attempt to procure it they can buy so little food that they and their whole families are undernourished, at a time when a judicious outlay of a portion of the means at their command, would give them ample food if derived entirely from the vegetable kingdom. In proportion to the nutriment it affords, beans are the cheapest food that can be procured in England; next, perhaps, comes wheat. These should be the staples of the poor, with a moderate addition of potatoes, green vegetables and fruit, rice, and other starches. After hearty meals of this food, there is but little or no appetite for tea, coffee, tobacco, or the arch enemy of the poor—alcohol. On such a diet the British Isles would support from home-grown

food a hundred millions of people less inclined to drunkenness and crime than the thirty-four millions, who, under the present system, are subject to many unnecessary temptations to crime and vicissitudes of disease, which a diet more in accordance with the order of nature would have prevented.

> "Not so the golden age
> Which fed on fruit,
> Nor yet with bloody meals
> Their mouths pollute."
> —*Ovid's Metamorphoses.*

C. O. Groom Napier.

ON THE LOCALITIES WHENCE THE GOLD AND TIN OF THE ANCIENTS WERE DERIVED.

Read before the British Association at Bristol, 1875. *(For the lively discussion which followed, by Canons Rawlinson and Tristram, see local papers.)*

The earliest mention of tin is in the Pentateuch, (Num. xxxi. 22, 23), where it is enumerated among the spoil taken from the Midianites. It is further mentioned in (Is. i. 25, Ez. xxii.), and was made into plummets, (Zech. iv. 10). It appears to have been abundant, for in Ecclesiasticus xlvii. 18, we read, speaking of the wealth of Solomon, "thou didst gather gold as tin." Tin is mentioned in Homer's Iliad (xi. 25); twenty layers of it were used in the making of Agamemnon's cuirass and his shield of twenty bosses, (Iliad xi. 25). The shield of Achilles was made of an alloy of copper, gold, and tin, (xviii. 474). The Etruscans were great workers in bronze as well as the Egyptians, and bronzes have come down to us of Carthaginian, Tyrian, Assyrian, and archaic Greek periods; therefore as tin was required for the composition of bronze, it must have been well known to those ancient peoples. If we take the age of the Pentateuch to have been fourteen centuries B.C., the age of Troy to have been twelve centuries B.C., the age of Soloman to have been ten centuries B.C., the age of the Etruscan bronzes to have been at least eight centuries B.C., the age of the Egyptian bronzes to have commenced from a period of at least 1500 years before the Christian era, the age of the Carthaginian bronzes to have begun 800 years B.C. and to have continued to the Christian era at least; that the Tyrian bronzes were probably as old as the time of Moses, if not older, the Assyrian not less, and the archaic Greek at least as old as the time of the siege of Troy; presuming the dates given in ordinary tables of chronology to be approximately correct, we have a range of 1500 years at least, mentioned by ancient writers B.C., during which tin was known. If we go still further back into the so-called bronze age, we reach a period which is denominated Prehistoric, which was at least as old as the earliest period we have mentioned. The late Mr. John Crawford, F.R.S., read a paper at Bath in 1864 on "the sources of supply of tin for the bronze weapons of antiquity." In it, he stated that there were at present three sources from which the tin used in ancient Europe could have been derived, Britain, Malacca, and China. And although tin is found in Spain and Portugal at present and was probably obtained from these places in old times, yet the quantity was too small we may reasonably infer, to supply the vast population of the ancient world with any considerable amount of tin. Cornwall and the south of Devon were, until re-

cently, the great European sources of supply, but have lately been largely supplemented by the tin of Banca in the Indian Archipelago. Mr. Crawford thought however that the tin obtained by the ancients was from the East, although it is clear that the tin of Britain was broght overland through Gaul to southern Europe by way of Marseilles, which is first mentioned in the age of Julius Cæsar. Strabo informs us (iii. 75), that the Phœnicians carried on a traffic in ancient times from Gades, which Pliny identifies with Tartessus in Spain. The Phœnicians, wishing to monopolise the traffic, concealed the passage through the Straits of Gibraltar to the Cassiterides. The Romans once followed a Phœnician vessel in order to discover the source of the supply of tin, but the ship perished on a shoal. The Romans not daunted, eventually discovered the route to the Cassiterides, or Tin Islands. Some derive the word Cassiteros from the Sanscrit Kastira, a word also signifying tin, which is an argument in favour of an oriental supply of this metal in ancient times, This derivation may fairly be matched with that of Britannia, which Bochart deduces, from the Phœnician Baracanac, the field or land of tin. The Britannia metal of modern times is an alloy of tin in harmony with the ancient bronze of British derivation. The Tarshish of the Hebrew Bible, satisfactorily identified with Tartessus in Spain, was an emporium of ancient commerce, especially characterised to shipping. The following are the principal passages in the Bible where tin is mentioned: Gen. x. 4; 1 Kings x. 22; 1 Chron. 1-7; Is. xi. 16, xxiii. 1, 6, 10, 14, lx. 9; lxvi. 19; Jer. x. 9; Ez. xxvii. 12-25, xxxviii. 13; Jonah i. 3, iv. 2; and Psl. xlviii. 8, lxvii. 10. There was evidently a large trade between Tyre and Tarshish, the latter being the great seat of commerce in the west and Tyre in the east. The ships of Tarshish, spoken of in the above passages, appear to have been suited for long voyages. lasting three years, 1 Kings x. 22. Three theories occur to the writer to explain these voyages. First, those contemplated by the servants of Jehoshaphat, 1 Kings xxii. 48, who made ships of Tharshish at Eziongeber, on the Ælanic gulf of the Red Sea, to go to Ophir for gold. In this case it appears that the term ships of Tarshish was indicative of the description of vessels, and might possibly mean oceanic decked ships or ships calculated for long voyages. The second, commonly held among scholars, would place Tarshish in some eastern locality; while a third theory supposes that the ships of Tarshish passed through the Straits of Gibraltar, starting from Tartessus in Spain; that they coasted Africa and doubled the Cape of Good Hope, and reached Ophir, which was certainly a locality accessible from the Red Sea, or ships would never have been prepared for a voyage to it at Ezion-geber, which, as was said, lasted three years. In 2 Chron. ix. 21, we read King Solomon's "ships went to Tarshish with the servants of Huram: every three years once came the ships of Tarshish bringing gold, and silver, ivory, apes, and peacocks." These ships must therefore have visited a land capable of producing these commodities. Gold was probably derived from eastern Africa, while the apes and peacocks (parrots?) some authorities say were from India. The ivory might be obtained from India, Ceylon, and Africa. If the theory that the ships of Tarshish made a voyage to India by the way of the Cape of Good Hope be accepted, they might have obtained both gold and ivory on the western coast. Annon or Hanno, a Carthagenian, wrote, in the Punic language, an account of a voyage he had made "round Africa," which was translated into Greek, and is

still extant (Vossius de Hist. Gr. IV.) It appears clear that Hanno visited the land of great apes in equatorial Africa. Some modern geographers think he doubled the Cape of Good Hope. Diodorus, Herodius, and other ancient writers mention voyages round this great promontory. The Carthagenians formed colonies in Spain, and conquered a great part of the country, and, working deep mines therein, acquired immense wealth. Some critics, therefore, are inclined to place Ophir in Spain, but it appears safer to infer that it was a general name for a gold-producing country. The word ophir is used in the Hebrew Bible (Job xxii. 24) as a synonym for gold; thus conclusively proving this theory. No Egyptian or Assyrian gold coins have been discovered among the antiquities of either country; the earliest gold coins being apparently the Darics issued about the time of the Babylonish captivity, by the Persian monarchs. The bulk of critics are, however, of opinion that Ophir was situated in Arabia, a belief founded on the fact that the sons of Joktan generally settled in Arabia, and Ophir, one of these sons, probably settled in a country not far off. It seems probable that one of the gold-producing countries called Ophir, was on the borders of the Red Sea, either in Africa or Arabia. Some think that an emporium for the collection of gold would answer perfectly to the ancient accounts of Ophir, and, from a geographical point of view, no better place could be found than Aden, which has long been a great seat of Arabian commerce, and would answer well as a place of deposit, both for the gold of India and of East Africa. The Mahra people in the neighbourhood of the Red Sea use the term ofir to signify red (Baron Wrede, "Jour. Geogra. Soc.," Vol. XIV., p. 110), and say they are the inhabitants of the red country, and call the red "bar ofir."

Bochart thought Ophir might be in Peru, from the resemblance of the name to Pervaim (II Chron. iii. 6), which he thought was identical with Ophir. But the Phœnician inscription found in Brazil seems to point to that country rather than to Peru. Bochart, however, believed in the existence of two Ophirs (Phalegii. 27), one in Arabia, the other in India, or rather in Ceylon.

Three places in Arabia have a name resembling Ophir—Aphar, Zophar, and Daffir. Sofir is a Coptic word for India, and Sophir is the word used for Ophir in the Septuagint, and by Josephus, who says it was India. Gold and almug or sandal-wood trees are obtained from India. The precious metal is found in the sources of the Indus and Cabool rivers, the Himalaya Mountains, and the Deccan. Josephus, however, says that Ophir was in the Golden Chersonese, which has been identified with the Malay Peninsula, now a gold-producing country, and one, when fully developed, likely to produce a large supply. But Africa is the country whence, from the experience of the present time, it seems probable that the greater amount of the gold of Solomon was obtained. When the Portugese, in 1500, voyaged to India, *viâ* the Cape of Good Hope, they found Sofala, a port on the Mozambique coast, a place of deposit for the gold of East Africa; hence some have identified Sofala with Ophir. We shall now speak of the sources of gold of the Greeks and Romans. In the time of Sophocles, the dramatist, gold was rare at Athens (Antigone v. 1,038). The gold possessed by the ancient Greeks was principally acquired by commercial means through the Greek colonies in Asia Minor, and the Islands, where it was in general circulation; the main sources of supply being India, Arabia, Armenia, Caldris, and Troas. The sands of the river Pactolus and of other streams

likewise afforded gold dust. The gold procured from Arabia was doubtless from an *entrepôt* in that country. There were gold mines in Scaptepyle, in Thrace, which were worked (Thucydides iv. 105); the gold was not coined, but laid in the Treasury in the form of counters (φβοῖδες Bockh. inscrip. vol. i. 145, 146). For a long period the Athenians had no gold coinage of their own, but they apparently made use of the gold coins of other nations. Later, Attic gold coins were issued, but they are extremely rare in collections. On the rise of the Macedonian empire gold became plentiful in Greece, as is proved by the comparative abundance of the coins of Philip and Alexander, kings of Macedon. About the time of Alexander the Great, gold coins of Ægina, Thebes, Argos, Carystus in Eubœa, Acarnanea and Ætolia, were known, and the Islands of Sicily and Cyrene also had a gold coinage. According to Herodotus i., 94, the Lydians were the first who coined gold, and Crœsus, their famous king, reputed the richest man of classic antiquity, was the first who issued them. They were known by the name of staters. Staters were also issued in Cyzicus Phocœa; the Islands of Syphnus and Thasos had anciently gold mines, which induced their rulers to issue a gold coinage. The gold of most of the Greek Colonies in Asia Minor, is much alloyed, but that of the Macedonian Empire is nearly pure. No doubt many of the ancient sources of the gold possessed by the Greeks, are nearly, if not quite exhausted; in modern times, the surface gold having been obtained, and there not being sufficient science or capital to work the mines in a remunerative manner, where the ore is poor or the depth great. The localities where gold is now found, are much too numerous to be quoted at length, it being one of the most widely distributed of metals, still this paper would not be complete without some review of them It occurs in Hungary and Transylvania, at Kremsitz, Schemnitz, Nagzag, Salathna and Offenbanya; Antioquia Choca in South America, between the rivers Yadkin and Katawa in North Carolina, in the Island of Araba near Curacoa, New Spain, Mexico, Peru, Beresowsk, Posing and Magurka in Hungary, in the Banat of Temeswar; Rauris and Schallegaden, in Salzburg, at Vöröspatak, in Transylvania, at Villa Ricca, Matto Grosso and Dimantina in the Brazils, in Bohemia, at Eule, Neuknin and Bergreichenstein; in Norway, at Kongsberg; at Schlangenberg in Siberia, at Tilkerode, in the Hartz; at Schwarzgrund near Rudolstadt; the Hundsruck; Aedelfors in Sweden; La Gardette in France and in Spain; in the Ural and Altai, between Neujansk and Nischne—Tagilsk; in North Carolina, Chilé, Bolivar, Aruba, St. Domingo, New Grenada, N. Scotia, Carodoc; in Africa, Siam, Thibet, China, Java, Borneo, Sumatra, at Crogan, Kinshelain, Wicklow, Glen Turret in Perthshire, Sutherlandshire and Cornwall; in the sand of the Danube, Rhine, Lech, Inn, Iser and Edder; in California, Australia, Tasmania, New Zealand, Nevada, Vancouver's Island, and British Columbia. Almost wherever lead is found small quantities of gold are mixed with it, which will generally pay for extraction if the country be rich, populous and civilised. While we admit the probability of the Hebrews, Greeks, Babylonians, Assyrians, Persians, Egyptians, Romans and Carthaginians obtaining their gold from numerous and widely scattered localities, but few out of the long list of modern gold producing countries, could have been accessible to them either directly or indirectly. Still the existence of Phœnician inscriptions in Brazil and Sumatra, seem to point

to Phœnician commerce with those countries in very ancient times; and if with these widely scattered localities, why not with Ireland, from whence the Wicklow gold was procured, which seems the more reasonable, considering that so much of the population of Ireland is held by many Ethnologists to be Milesian, affiliated anciently to Milesius, king of Miletus in Greece. And if with Brazil, why not with other gold-producing countries? such as Mexico, whose ancient traditions mention (see Philips and Dana's "Mineralogy") the arrival of voyagers from the West, who instructed them in Arts, long prior to the advent of the Spaniards. (Vide Prescott's hist. "Conquest of Mexico.")

As a strong argument for an early connection between the Tyrian trader and the people of the far East, we may mention the manuscripts on split bamboo, in Phœnician characters, obtained from Sumatra, described in a paper read before the Anthropological Institute, on December 22, 1874, and stated to be still in use in the district Bejang, Lemba, and Passuinmah. Some of these MSS. are in the library of the India Office. The written traditions of Java and Sumatra, according to Sir Stamford Raffles's "History of Java," and Masden's "Sumatra," page 3, second edition, mention the arrival of ships in early times from the Red Sea and Persian Gulf, when vessels coasted round the Bay of Bengal. Alexander is said to have built a bridge on the sea, which may mean that some ships in command of his officers arrived direct from India. Three of his descendants are said to have become kings of Palinbang, &c. The ships would have been manned principally by Phœnician sailors (Jour. Inst., Vol. iv. 388). There is nothing improbable in the ships of Soloman having visited Sumatra and other islands of the Archipelago and obtained from thence the apes and peacocks, and the cassia and sweet cinnamon used in the making of the holy anointing oil (Ex. xxx. 23). The word cinnamon is Persian—cinn-amon—that is, Chinese ammomum, or Chinese spice. Speaking of the return of Israel (Is. xlix. 12), they are spoken of as to come from the land of Sinim, which is no doubt an allusion to China, in the present day the abode of a good many Jews. If modern science has discovered relics of Phœnicia in the East, it has been equally fortunate in the West. In the Journal of the London Anthropological Society for 1874 there is a paper on a Phœnician inscription from Brazil, which we take to be conclusive as an argument for widespread Phœnician navigation in very early times. This inscription was discovered by Joaquim Alvesda Costa on his "Sitio de Ponso-Alto nas Margens de Parahiba." His slaves were seeking for building materials, and found a large stone in Phœnician characters. The son of M. da Costa sent a copy of the inscription to Dr. Netto, Director of the Brazilian National Museum, who has translated it, as have also Messrs. E. Richmod Hodges, of London, and the Rev. Professor Prag, of Liverpool. These translations differ slightly, but in no important particular. We give Mr. Hodges's translation as follows: "We (who this) stone (have erected) are Canaanites, Sidonians of the royal City, the prosperous or secure emporium. We are not natives of the land of Rome or high land, and we praise the gods and godesses. In the ninth and tenth years of Hiram, our mighty king then, we went from Ezon Geber (*i.e.*, Ezion-Geber) in the Red Sea, and we departed with ten ships, and we were in the sea of Yakbo two years, going round the land of Ham, and we departed from Jerba'al, and we did not take shelter, and we came here twelve men and three women, without loss

of a man. I am Methu-Astarte, chief of the sailors. The gods and godesses be gracious unto us." This visit of the Zidonians to Brazil, even if accidental, would be no argument whatever against frequent communication between Brazil and the East. The alleged impossibility of the ancient navigators crossing the Atlantic receives its death blow from such a discovery as this. We have a clue to the early peopling of far distant countries—a confirmation of the single pair theory of the origin of mankind, and of the existence of an Ophir in America. Mr. Hyde Clarke, in a paper read before the Anthropological Institute, has shown many instances of correspondence between American and Asiatic names, which strengthens the supposition of early intercourse between the East and the West.

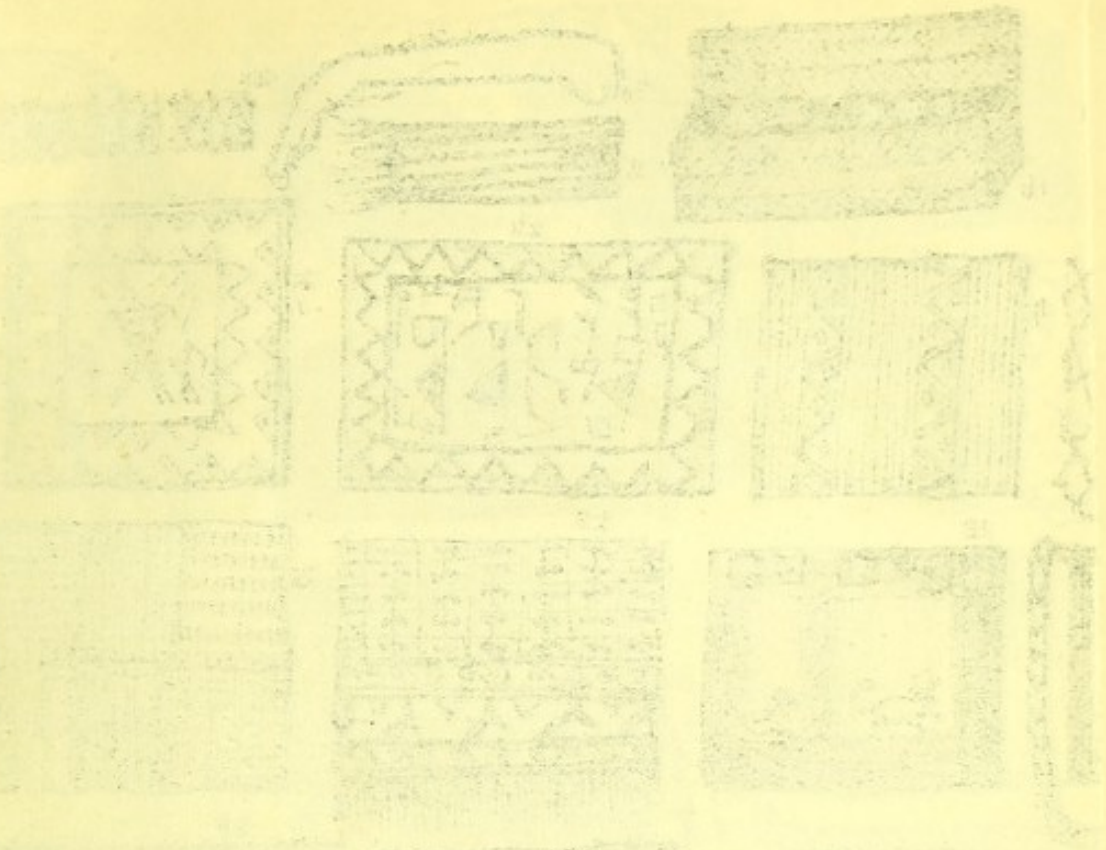
C. O. GROOM-NAPIER.

NOTES ON DIAMONDS, GOLD AND OTHER MINERALS FROM NEW GUINEA.

MR. J. JOHNSTONE has lately arrived from Australia, bringing with him a purchase of minerals collected during four years' residence in New Guinea, by Mr. T. Smart. The minerals cover a very large dining table. Mr. Johnstone has allowed me to describe them in B. H. First: Seven large diamonds. A. A fine crystal of about six carats, very perfect in its form, like a Brazil stone B. Three smaller diamonds, each in its ferruginous matrix. C. A small diamond red as the finest ruby, clear and about a quarter of a carat weight. He was offered £15 for it. D. Three small yellow diamonds, one a finely formed crystal. Second: Rubies and sapphires; a quantity of large opaque rough stones, some showing the crystalline form well. About a thimbleful of ruby grains of fine colour, an equal quantity of clear sapphires. Third: A piece of trap rock attached to granite, containing a beautiful group of white crystalline topazes, some doubly terminated, with crystals of black quartz and aquamarine. This specimen is worth about £10, and is like those found in Siberia. Fourth: Aquamarines; some fine large worn pebbles from 1oz. and under in weight. Fifth: Beautiful clear crystals of almandine garnet, and varying from an inch to a quarter in diameter. Sixth: Ochre coloured zircon, opaque large crystals. Seventh: White topazes, fine pebbles. Eighth: A variety of pearls from different classes of shells of different colours. Ninth: Gold, both very fine dust, coarse grains, nuggets in quartz and detached. The most remarkable specimen is a geode of quartz which, being broken in half, discloses a cavity full of crystalline quartz and hexagonal crystals of gold, the best formed I have ever seen. There may be two ounces of pure gold in this specimen.

I have ascertained that there are seventy species of minerals in the collection, quartz, crystalline in many forms and colours, jaspers, agates, and onyxes in great variety, fluors, cuprite, copper pyrites, pyrite, hematite, all well crystallized; sulphur, graphite, galena, blende, both opaque and transparent; native iron, silver, copper, and platinum, coal and lignites, primary, secondary, and tertiary, cobalt, arsenical and nickel ores, uranium, rutile, cassiterite. Space will not allow mention of more, but I am promised the privilege of exhibiting them, of which particulars will be announced. Mr. Johnstone is an advocate for the British annexation of New Guinea, and so am I.

C. O. G. N.



PREHISTORIC PERUVIAN ANTIQUITIES.

BURLINGTON HOUSE.

FEBRUARY, 1879.

STUDIES FROM NATURE.

(*Continued from page* 217.)

CHAPTER III.

HERALDRY AND GENEALOGY—THEIR IMPORTANCE AS STUDIES—THE HERALD AND HIS PEDIGREE—A PROUD AND SOUR PRESBYTERIAN.

HERALDRY is an important subject, and should not be considered merely an excuse for parade, elaboration or expenditure of money. It is a science of emblems, by which animals, or inanimate objects, are made to typify qualities. This was the primeval institution of Heraldry; antiquity of arms was then little valued. The qualities of the individual, or those he most admired, were represented on his shield. It is a mistake to suppose that Heraldic insignia were co-eval with feudalism. The four standards of Israel; those of Egypt, Assyria, and Rome, prove this to be an idle fallacy. It was perhaps fortunate that in the more advanced feudal age, coats of arms became hereditary; for by this means we have many a clue to the origin of families, and to much that would be otherwise obscure in genealogy. There are many among us who undervalue genealogy and family history, exclaiming, "*Cui bono.*" But are these prepared to renounce parental and fraternal ties, for it is only the superficial, who confine the term kindred to contemporary relations. The son naturally enquires the early life of the father; the father that of his father; and thus oral information is sought stretching back for several generations. It is quite the exception to meet with those who have no curiosity,—at any rate in youth—about their immediate ancestors. Inglorious pursuits may so absorb the mind of "a nation of shopkeepers," as to make them forget history, both of families and nations, for the same qualities of mind make men indifferent to both. The history of nations is principally valuable from the practical examples it affords of the result of national movements, both for good and evil; family history is equally instructive in the family circle. To think only of the present, in the one as in the other, is alike foolish.

The interest derivable from family history should be by no means associated with titled or wealthy ancestry; such is very well in its way, but is an insignificant honour when compared with that derivable from ancestors who have been pious, or morally and intellectually elevated.

> "The rank is but the guinea stamp;
> The man's the gowd for a' that."

To despise humble and honest ancestors is the most paltry of feelings. I have met with some who did so, and always thought that the generation I knew, however contrary it might be to the general opinion of their acquaintances, was a sad falling off from the preceding. One in par-

ticular, who, while apparently whiningly humble, yet despised his worthy grandfather, who had every quality of excellence he possessed, and was destitute of his paltry pride. Lord Macaulay, whom no one will charge as an adherent of the aristocracy, remarked "that a people that takes no pride in the achievements of remote ancestors will never achieve anything worthy to be remembered with pride by remote descendants."

If from a very early age we make anxious inquiries of elders as to events and facts which they have experienced, or which have descended to them by tradition, we pick up many scraps of information, both about family and local history; but this knowledge is only fragmentary, and many undiscoverable links are wanting, so that much patience and perseverance are required on our part to solve those obscure points in genealogy, which perhaps might be cleared up, after a very little study at the British Museum, the Herald's College, or the Public Record Office. It is not everyone who has these facilities, and this was my case. What little I did discover was remembered or written down, and I waited patiently to know more. I had access to the best library in the town and was perusing a Peerage, when a little dark man in a buff-coloured coat passed by me and cast a hasty glance at the "Peerage" open before me. "Do you want it?" said I.

"Presently, when you are done with it."

I handed it to him. "It is Burke's, there is none like that," said I. "It contains the essence of so many of the older works, that it is a library in itself."

"I am glad," replied he, "you take an interest in these studies, for so few do so now-a-days; nothing is valued but what produces a pecuniary return, and the student, the antiquarian, and the herald are held very cheap."

Conversation was not nominally allowed in the room, but it being then nearly empty we were not much in danger of disturbing others. My companion had in his hand a black leather bag which he now opened, and took from it a circular, vellum covered case.

"This," said he, "contains the original grant of some land in the county of Sussex to an ancestor of mine, by King Henry II. The land has been some centuries out of the family, but it has been the hobby of my life to purchase it, and I have only just now paid the first instalment of the money."

On this the old gentleman took out his card case and handed me a card.

"You may, perhaps, know my name; I am a member of the college of heralds." And his face became illuminated. "I am now working at my own pedigree, it is all as clear as daylight from Henry the Second to Edward the Fourth; but between that and Henry the Seventh two generations are confused. But my brother heralds think, from the name, the county, and the arms being identical in both, that my ancestor of the days of Henry VII. was the grandson of the man who lived in the days of Edward IV."

"Well," said I, "I think I can give you a hint. There is an old history of Sussex in this library, containing a lot of notes in manuscript of pedigrees; your very peculiar name occurs in it, and, I think, a sketch of the arms. I will ask the librarian for it."

The old gentleman turned over the pages of the book with an air of keen expectancy but great carefulness. His eye lighted on a little note at the bottom; he turned to a page.

"Here in truth is what I have been looking for during many years, and what I have offered £10 for over and over again,

He took out a manuscript book and made a note of it.

"I shall endeavour to buy this

book from the library," he continued; "but I shall now copy all these notes in my illuminated pedigree."

On which he showed me a case made of cowhide, enclosing an inner one of vellum, which contained a roll of about four yards long, on which his pedigree was most splendidly illuminated in gold and colors. The male line was represented by a river of gold; the female by a stream of silver. It was not a genealogical *tree*, it was a genealogical *stream*, the different branches of which had their rise in different parts of England. The various country seats of his ancestors were prettily painted as on a panoramic map, while their names were marked on a tablet by the side of the house. In one instance where the ancestor had been ruined through his loyalty to Charles I., and had taken to innkeeping, his pedigree appeared on his inn sign, by the side of the family arms. "But this very man, said he, at the 'Restoration' was received at Court, and made a Justice of the Peace."

The Herald thanked me very much for my help, and said he would be pleased to assist me in a similar way, on which I at once stated several queries relating to Scotch genealogy.

"I am," he said, "no great authority on this branch of the subject; but I have, singularly enough in my bag, an old manuscript genealogical history of Scotland, with an appendix of pedigrees by my deceased brother. You are welcome to look it over during the two hours I intend to be here."

This manuscript history gave me just the sort of information I required. The families it treated of were few, and it took no cognisance of the events of the last 100 years. Those of the days of the Stuarts were often treated in very great detail.

I was never able to meet with the "herald" again, or obtain another peep at this book. But I had seen quite enough to obtain food for meditation. It is common in books of genealogy to dwell merely upon those circumstances of family history, which tend to throw lustre on the individual—a great mistake. The consequences of wrong or foolish actions, as of good and noble ones, should be brought home to their authors, and their descendants would then have the benefit of their example. Those who undervalue family history, mostly know nothing about it.

If we survey English history, we are forced to admit that the majority of our noble and illustrious men have had ancestors whose lives have not been passed in obscurity, and those whose pedigrees are little known I believe on careful examination will be found to contain individuals who possessed similar qualities to themselves, either in a greater or less degree, or under great repression. As an example of this I may mention a distinguished musician of the present century of whom I heard it said that none of his ancestors had showed much skill in music. I, however, by accident discovered that his grandfather had much taste for music, but that his trade, that of a bricklayer, injured his touch for musical instruments. If he had possessed equal advantages to his grandson he might have been a notable musician.

On my return from the library, I encountered a Scottish Presbyterian minister, to whom I mentioned my discoveries and conversation with the Herald.

"I hope you don't waste much of your time in these investigations? They are utterly profitless and vain. What good can it do anyone to know that he is sixth in descent from a duke, or even that he is of an ancient county family? For my part, I don't care about knowing what my grandfather was. I never saw him; he died when I was a little boy. I think all these inquiries are but the pomps and vanities of the world," said the Rev. Mr. Growler, with a sneer.

I turned to Mrs. Growler, who was sitting near her husband, and she said to me:

"I differ *in toto* from Mr. Growler on these points," on which I went and sat near her, and she went on to say, in a loud voice: "He is a little deaf and won't hear us. There is no wonder he wants to forget his grandfather, for he died, poor dear man, in the workhouse, where his unfeeling son, a wealthy tradesman, let him go. He was originally a small farmer, but, losing his sheep through rot, he couldn't pay his rent, and was rouped out. His son was a wholesale chemist in Glasgow, and when the old man came begging to him he cursed him, and set all his children laughing at their old grandfather, which so broke the old man's heart that he never came near them again, but went to his own parish and gave out that all his children were dead, and died himself a few months after, unheeded by the wealthy chemist. Those middle classes are so fearfully selfish! I wish I had never had anything to do with them. Growler is as stuffed with family pride as ever he can hold. He never mentions his brothers and sisters, because they are of the mercantile class, and will hardly let me be commonly civil to them because my father was a Dumfriesshire laird. 'We are county people,' he says, 'and it won't do for us to be at all identified with the Glasgow mercantile class.' Therefore he need not talk about despising family. Pride is his besetting sin. Could he find out that he was fifth in descent from a duke he would jump out of his black gown with joy; and, although he talks about my excessive family pride as unbecoming a Christian, when he wants to humble me, still I know that he is always puffing my descent to his brothers and sisters, much to their annoyance."

Mr. Growler was evidently quite the type of a class. He wished lords and dukes to come down to his level, but thought himself far above the level of his parents, brothers, and sisters, and that it was quite unreasonable and monstrously degrading to associate with persons, quite as well educated as himself, but one degree lower in the social scale, such as Dissenting ministers; while for men at all poor, however well born or well educated, he had the utmost contempt; they were only tolerable when obsequious to him.

The poor grandfather he so much despised had pinched himself to send his son to the Glasgow College, where he distinguished himself for his knowledge of chemistry; and during the first years of his son's married life, as long as the old man had anything to give, frequent hampers of potatoes and sacks of oatmeal were received by the degenerate son.

Personal pride, repressing the ties of nature, common enough in Europe, is even more general among hybrid races.

THE HISTORY OF A PHILOSOPHER: ADVENTURES IN BRITAIN.

(*Continued from Page* 124.)

My wife was a great advocate for the decimal system in weights and measures; while I preferred the old *régime* of twos and fours. It was foolish to attempt to Frenchify the English, who would never consent to surrender "Troy weight," however long it might be besieged. The old wooden stalking horse of equalisation will never be admitted by John Bull within his gates. Not having been very long married ourselves, we were very fond of attending weddings, and viewed with no common interest an announcement entitled "Approaching marriage in high life. An alliance is contemplated between the Honourable Hyde Park and Miss Maida Hill; the ceremony will take place in St. Marrow-bone Church. The dresses have been ordered from Mesdames Moussline, Sarsanet and Co.; the bouquets from Messrs. Flower and Cutbush; the breakfast and the cake from Messrs. Baker and Cooke, of Baker Street; and the carriages from Mr. Horsfall."

My wife and I went to Marrow-bone Church, to witness this august ceremonial. The bride was given away by her father, Pentonville Hill, Esq. The bridesmaids were Miss Primrose Hill, (a stiff young lady overlooking the Parks), sister of the bride, Miss Victoria Park, sister of the bridegroom, and Miss A. N. T. Hill, the bride's aunt, or as given in Cockney shorthand, Aunt Hill. The bridegroom was attended by some of the most influential members of the Park family, as well as by some of the loftiest Hills. There were Mr. Battersea Park, Mr. Regent Park, and Mr. Richmond Park, brothers of the bridegroom; his cousin and next door neighbour, Mr. Park Lane, and the eminent solicitor, Mr. Chancery Lane; and Mr. Ball Pond and Messrs. Ludgate, Holborn and Andrew Hill, brothers of the bride. My wife and I having high interest in courting—next best to having interest at Court, got permission to see the bridal presents, many of them very magnificent — among them an ivory-bound copy of that pretty little book "Hill's it is well." As soon as the ceremony was over, the happy pair betook themselves to the Derbyshire hills, to spend the honeymoon with some eminent members of the Hill family. The assembled band played magnificently, "The Green Hills of Tyrol."

London boys are very sharp. I noticed a young lad working hard at one of the City pumps.

"What do you call, yourself," said I to the little fellow.

"I'm a pumkin. Sir, and a water drinker, too, and no follower of Backuss."

I am a great admirer of English cheese, so I asked this clever boy to direct me to a good cheesemonger's.

"There's Cheddar and Coy. just round the corner; but they don't keep Stilted cheese."

"Then they won't do, for it's Stilted or Stilton, I want."

But my wife was anxious to try, so we entered the shop. There was no name over the door, but we asked a young man if he was Mr. Cheddar. He hesitated.

"Perhaps," said I, "you're the Coy?"

"Yes, Sir."

Of course we visited the British Museum. My wife went there par-

ticularly to see some antiquities of the Age of Moses—the Mosaics, I mean. By the way, how this poor man is now abused ! It is not only sceptics and other humbugs which fasten on him, but real, genuine English Bishops. But I think his tables of stone are proof against all their shafts. I heard the other day a faint echo of an expiring curse from the infidels of the Continent.

"Charge, Colenso, charge ; on Stanley, on,"

Were the last words of M. Rénan.

Becoming a convert to modern Spiritualism, I purchased some spirit drawings, which my wife called "draft spirits ;" one of the most important of them almost assumed the dimensions of a great National English painting. It was entirely ornithological, and was entitled, "Bird-eat-Coots." A large vulture was depicted, eating up a quantity of little Coots. There was a view of Coots' bank in the distance ; the last of the Coots was made to say, "I'll give you a check, Miss Vulture." Coming out of the bank was Miss Angelina, in the character of an angel, with a coronet of good works on her brow.

My movements about London at this time were a good deal obstructed by corns, which my wife noticed, and said, the "Pilgrim's progress is surely much hindered by corns, but would be much more so by bunions."

We accepted an invitation to stay with a farmer's wife near London ; she was a homely sort of person, and boasted that she had everything within herself. Soon after our arrival, we sat down to tea. "I hope you will eat heartily, my ducky," said she, "there are new laid eggs and plenty of milk and cream. We always lay our own eggs. This is my own milk, and these are home made sausages." My wife looked at me and cocked her little nose higher than ever.

"It seems," said I, smiling complacently on our hostess, "that the proverb is true, 'if you want a thing well done, you must do it yourself.'"

The Rev. Professor of Stammering, Mr. Wordsworth, had been spoken of by many of my friends as a most wonderful man, and I much longed to have an interview with him, to ask him to cure me of an occasional impediment in my speech, and impart a little of his eloquence, or, as his enemies variously called it, magniloquence and grandiloquence. He had obtained a degree of Dr. from the famous German University of Bosh, but was really a most eminent Neologian. I was walking in the heart of London one day, when a shabby-genteel, elderly man moved towards me, as if to speak. I instinctively grasped my pockets and kept a sharp look-out.

"S—er—er, I am a strang—er —er, in Lond—on, and I want to know the way to Reigate."

"Well," said I, "you must go by train or walk, or take a cab or omnibus. If you walk, you better cross Westminster Bridge."

"How fa—ar is it ?"

"More than you could go in a day."

"S—er, do you know if Professor Wordsworth lives at Reigate, for I want to go to him to cure me of this confounded sta—mmer—ering, for, unless I get cured, I won't be able to keep my excellent situation of stump-orator to the Peace Society ? I'd give ten pounds to be cu—erd."

I looked in my new friend's face; it seemed honest, so I took my hands away from my pockets.

"Sir," said I, "I am on the look out for Professor Wordsworth myself, so, if you like, we'll both go together ; and, as you are a poor man, I'll pay the fare and give you your grub into the bargain."

My new friend took off his hat.

"Grubb's my name, S—er. If it ain't a pretty one, it's a useful one."

"You don't always stammer, Mr. Grubb?"

"Nun—un—no—o, Sir, only when I's a thinking about it, S—er."

We started from the Charing Cross Station, and in two hours stood before Professor Wordsworth's gate.

A large board indicated that the place was called Stutter Hall, and that the institution was open to the public twice a week. Fortunately for us, we were on the right day.

I sent in my card, and was glibly asked by a page-boy to walk upstairs, which we did, and soon found ourselves in a mediæval hall, built on the ruins of St. Stutter's Church, an ancient structure, which in bygone days had been erected to the patron saint of stammerers. The pupils, to the number of near one hundred, were going through their alphabet.

The Rev. Professor stood on a green-baize table, and beckoned to his best boys to say their lessons, which at first seemed to be exercises on the alphabet.

"Arthur Alfred Angus," said the Professor, "repeat your lesson."

Arthur Alfred Angus did as he was bid, and, in a doleful voice, said:

"Alas! Agnes, anguish attacks my art. I am taken aback. In vain I abase myself before the abbot. He absolves me according to his art. But I do not advance at all in admirability. Adults, according to the abbot, advocate adultery. Adorable Agnes, adorn thy Adonis and cast thy ancient Adrian adrift for the adjutants to assassinate and absorb."

This pleasing soliloquy was repeated by the whole school, when Dr. Wordsworth called upon Bathsheba Bell, of Bath, to bring forth. She at once bawled:

"Back up your babyish brothers, Bacchantes, at the bar bawling Bab ballads. Be not badgered, brethren, from bringing your bacon to Birmingham, bad though it be; and be sure you bring it in a baize bag, and blow bag-pipes, by-the-bye. Bailiffs will not bite your bairns bald-headed ballast of a balloon, no bigger than a bandy-legged bantam. I will beat you with my bamboo on a banama, for you are a bankrupt, bad one; not worth a bannock of barley meal, although better than a barbarous, bare-footed Baptist of Barbadoes."

"Charles Charlesworth," said the Doctor, "chatter about chestnuts, calligraphy, cat-calls, culculus, calfskin, or calico, to the cadets. Don't cackle like a cacique or a cœchalot, but like Colin Campbell, your cousin, the Cambist."

Charlesworth at once began:

"Camels come to Cambay, commonly carrying cameos, carved curiously with a camera-lucida. Canals candidly constructed of candy or cannel-coal, at Candlemas, by the canon of the cathedral—a condor, certainly, among the clergy; a canker in the church, though not chary of his canteen or his canoe."

Daniel Douglas was next demanded.

"Deafness," said Douglas, "debars dab-chicks dace, Daddy Longlegs from dabbling in daguerreotype. Decay decimates deeds and makes them defective."

The whole of the letters of the alphabet were gone through in this way. This was an almost daily exercise, and greatly improved the pupils in spelling and pronunciation, and by calling especial attention to any defect was the means of cure.

As I occasionally stammered, I determined to give myself half-a-dozen private lessons from the Rev. Professor, which cost me, unfortunately, as many pounds. My poor companion was disheartened on hearing of the terms the Professor demanded, but stammered out his thanks to me, and resolved to set himself some stuttering exercises, in

strict accordance with a treatise on the subject, which he purchased within the walls of Stutter Hall.

As I considered all these pursuits very profound, and in consequence very wearing to the human frame, I determined to take a little recreation, and so, accordingly, I went the round of the sights of London. I was devoted to omnibus travelling. There was an air of universality about it. Is not that beautiful compound word omnibus derived from that Latin root, *omne*—all? But my wife and I generally had a 'bus all to ourselves. We thought we'd go to the Crystal Palace one day, so we hired a large omnibus. It soon stood at the door. Just at the last moment my wife was taken ill, so I had to go alone.

Wishing to see a little of London life, I jumped on the "knife board," and shouted "Bank" just as a stout gentleman came up. A lady would have followed him, but I said "this is a private omnibus which don't admit ladies." She stared, as did the stout gentleman. I pulled the bell and we started. Presently we saw another stout gentleman gesticulating with an umbrella, and shouting "stop—stop." I roared to the driver to pull up, and I took in a second stout gentleman. We drove on a few yards further and it began to rain, when lo! two other stout gentlemen jumped in, being evidently brothers of nearly the same size and weight. I stopped as often as I dared, for the police several times drove me on by shouting "higher up," and at last I got my omnibus full of stout gentlemen, all bound for the City. The horses groaned they had never known so great a weight before. When we got to the Bank most of my passengers got out and were surprised at my telling them there was nothing to pay. They were astounded and said:—

"How's that?"

"Because this is a free omnibus."

When I got to London Bridge I looked out for thin people, to give the horses a rest, and, before I got a mile, was full of "scarecrows." I was full inside to all but thin, and, it being cold and gusty weather, my inside showed no tendency to turn out. When I had got rid of all my thin gentlemen, I thought I'd take in a batch of stout ladies. I cast them all out, and soon filled my 'bus with mothers, each having a noisy infant. When my 'bus was half empty, I shouted out "Ladies and gentlemen, take notice. This 'ere is a free 'bus, bound for the Crystal Palace; who'll have a drive?"

This style took wonderfully with the cockneys, a class, however, I, as a whole, detest. They are the selfishest, most flippant, superficial set of wretches I know, and come next to us Yankees and the Yorkshiremen in cheating. I wouldn't trust any one farther than I could see him; and as for marrying a cockney girl, if I were s widower to-morrow and she were a millionairess and the handsomest girl out, I should spurn her. When I got to the Crystal Palace, I was surrounded by a crowd of women, all bent on treating the conductor, whom they supposed to be me. My pockets were stuffed with motto kisses and other bonbons. But by the time I had seen a little of the Palace I was thoroughly tired of conducting, so I jumped on the box beside the driver, and drove home empty.

We were eminent correspondents of Mr. Harriet Beecher Stowe, that gentlemanly person who wrote "Uncle Tom's Cabinet;" and knowing his devoted admiration for Lord Byron, were not very much surprised by receiving a letter and a poem from him after a triumphant visit to the battle-fields of the South, on which he told us he had made a fine collection of the bones and teeth of rebels; and had col-

lected with his own delicate fingers enough of the latter to make bracelets and necklaces for himself and all his lady friends. When at Natchez he went alligator shooting, and was fortunate in hitting one of the largest of these reptiles, as it crawled on the banks of the river. He could not help apostrophising it in these beautiful lines :—

"I see before me the alligator lie,
He leans upon his paw—his reptile brow
Consents to death, but conquers agony,
And his drooped head sinks gradually low,
And through his side the last drops ebbing flow
From the red gash, fall heavy one by one.
Like the first gush of alligator's tears; and now
The river swims around him—he is gone
Ere ceased the inhuman shout from out the wretch who won."

This wretch, I suppose, Mr. Harriet Beecher Stowe felt to be himself, and so immediately went home and subscribed largely to the "Society for the Protection of Animals,"—a society for which, bye-the-bye, I have a great respect myself, for I think it is doing an immense amount of good.

With my Darwinian principles, I have strong hopes that this society will be the means of much benefit. I hope to see animals elevated; if not quite to the level of man, at least half way; and if man comes down a step to meet the brute, it will be all the better. Man has too long stuck up for his dignity. The pride of man is a favourite subject with preachers, and well they may preach about it. I attended a meeting for "the society for the protection of animals," in London. Animals gave evidence and a cat was sworn. The most interesting case was that of a donkey, who sought damages from his master for breach of promise of marrige. Next there were two turtle doves, who desired a divorce, but whose master, a cruel publican, insisted on keeping together. There was a dog who was ordered to pay half a crown's worth of bones a week, for the support of an illegitimate family. He did not say anything on hearing the order, but he was evidently much annoyed. His manly dignity was hurt. His master who was allowed to give evidence, defended him, but could only get the half-crown mitigated to eighteen-pence worth of bones, on account of the poverty of his dog. The mistress of the aggrieved female dog expressed her intention on behalf of her canine dependent, of bringing an action for breach of promise of marriage as a next friend, which I have no doubt would be successful, as she was a very attractive and highly proper single lady. Among other cases, I should mention, that one horse complained to the society, of being underfed; another of not being allowed to marry, a third of being in an ill-drained and ill-ventilated stable, a fourth of being whipped by his master; while a fifth got his master fined for saying half-a-dozen bad words to him. According to the laws lately passed by the British Parliament for the protection to animals, a man requires to be extremely cautious in his behaviour to them. He can be fined from ten shillings to five pounds, for every lash he gives to his horse or dog, and he is not allowed to sell any animals without their consent. As animals have not yet acquired the faculty of speech, their evidence is interpreted by biologists, paid by the socieiy. And masters are not allowed to compel their quadrupeds to marry those that they are not inclined to. If a man kills a horse, the Lord Mayor may order him to be put to death; and cases of assault may be tried by juries of quadrupeds. It is quite time for the law to be altered; man has tyranised too long over the brute; the Republic of Nature proclaims man and animals to be free and equal; such is the birthright of Nature. Cruel

man may deny it, but it is not the less a right. The day is not far distant when quadrupeds will rule, and will drive about Hyde Park in carriages or velocipedes, drawn or worked by men. Man has too long had his day, and so "every dog's day" is coming. Man is in truth fast "going to the dogs."

When at our lodgings in town, I received certain information, that an interesting fight for £100 a side would come off in Greenwich marshes. I could not lose the chance of this, so I took a ticket for the special train, and was soon on the ground. The ring was formed, and Joe King and Bill Sykes sparred for some minutes. At last an unlucky blow from King hit Bill on the nose, and he "bit the dust," crying "Ruin seize thee, ruthless King."

We went to Scotland where we heard many funny stories. Once upon a time there lived in the South of Scotland a minister who had well studied "Fuller's Sacred and Profane State." He was remarkable for his popular and homely illustrations, which generally made a great impression on his audience. He got into the pulpit one day and said, "Now my brethren, I'm a good shepherd, and my clerk, Davie Geddes, he's my dog."

"Hold, Sir," said the clerk, "I'm no your dog."

"Whisht, Davie, I'm speaking mystically."

"Deed, Sir, you're speaking very impertinately."

If the sermon began and ended in this style, I do not know how I and my wife could have kept our countenances grave, or our mouths shut if we had heard it. Sydney Smith says "it takes a surgical operation to get a joke into a Scotch understanding," and I believe he is right. How different they are from the Irish.

Having occasion to go to the "West End" of London, we took a Royal Oak omnibus, which, stopping at Regent Circus, conveyed us along Oxford Street. Whenever we stopped, the conductor roared out what seemed to be "Mr. Praed's Street."

"What a wonderful man," said I to my wife, "Mr. Praed must be, to have a street all to himself. It's Mr. Praed, the poet, of course. After building "a bridge of sighs" at Venice, he came and built a street of poems in Paddington. "You've heard, my lovey, of poetic feet, and this lengthy street will prove to you a long metre."

We passed through Praed Street and reached the Great Western Hotel.

"You've heard of Belmont tower, that's it, my dear. Shall we go there and have supper?"

My wife thought it would be very romantic and poetical to do so. So I spent a sovereign very pleasantly, and quite forgot Mr. Praed and his dreary poem. We were just rising from table, when I felt a hand on my shoulder, and lo and behold, there was my cousin and old playfellow Bob.

"Well, Pigge Wiggins, how came you here? I hear you're turned a guinea-pig, that you are as rich as a Jew."

I laughed.

"The troughs are nearly empty," said I; "but we can have some more wash; I'll pay for you."

And he sat down.

Hog's flesh does not seem a very refined or elegant name, but we once knew a Dr. Hogsflesh, who was one of the most refined and polished gentlemen, my wife said she ever saw. The greatest rudeness flowed off him without leaving a stain, as water would off a duck's back. The dear good doctor, one Christmas sent us a goose, but from having been rather long on the way, it was too fragrant for our use; so we handed it over to the

page-boy, in waiting, at the lodging house we then lived in. This boy was really about forty and very stout, but, being unmarried, he liked the notion of being thought a very young man. On my wife questioning him what had become of the goose, he drew himself up to his full height, and in a most solemn manner pointed to his waistcoat, and repeated these beautiful lines :—

"When thou read'st this page alone,
Oh think of who is buried here."

In the midst of my scientific lectures, I received a most pressing invitation to spend a week with a most charming family in Yorkshire. We could not resist it, so left a staid Irish upper servant in charge of our premises, with strict orders to report every event that occurred, weekly, by letter. We were staying with a Mr. and Mrs. Grant, and were much amused one morning at breakfast by the appearance of a letter, sealed with a thimble, and addressed to Mrs. Dr. Pigge Wiggins, Swiny House, Larderton, Yorkshire.

"If you will excuse me, I will open it," said my wife. She had hardly broken the seal, when she burst into a laugh. She continued to read amidst well-nigh unextinguishable laughter. At last she said : "I cannot read it till breakfast is over, but I should be glad if you would read it to me. It is from my housekeeper in town—a very humorous Irish woman. I told her to tell me everything that occurred during my absence, how she spent her time, and if any cards or parcels were left for me."

I took the letter and read :

"MOST ONORD AND HORRIBLE MY DAM,—I have dun my best to execute all your commissions. I have sent the works of Lieall and Liebigge, and other eminent liars, to Fleet Street, to be bound in Russia ; and Costermonger's Eli, arranged for the piano 40, to be bound in half-calf, all to Mr. Butcher's, the binder's. The Cheerupadust have sent in his bill for cutting your husband's corns ; and the foetografts have arrived from Bugboy injunction. There was no one in the house but myself when they arrived, so they kept ringing some time, as I was dressing and in stationary, so I fered I would not have them on in time to keep the foetografts from going back to the stayshon. But Mr. Daniel Wapper, of Wapping, timber merchant, the 6-foot man you have seen, who is coming a courting of me, paid a bob for the foetografts ; so when I came to the door I was taken in arms by Mr. Wapper.

"We were going out for a walk in Hyde Park, when the horetissicus of dried leaves reached us from Q. Two days ago the Geeupological Society sent you the Ammonites, Moabites, Hamites, and an immense piece of an Amalekite, a slice of a real fossil Agag. A little bit is chopped off, it would make a nice broach for you, as green as ould Ireland. Dr. Sicamore has sent the dispeptic medicine for yew.

"Last Sunday Mr. Wapper and I went to church. Mr. Wordsworth, the Rev. Professor of Stammering, preached on Shem, Ham and Pork, and the Science. Mr. Wordsworth said of Annatopology, and said he was led into many clerical errors. As we walked home from church we fell into an argument.

"'A flirt is a lover of mankind,' said I.

"'Yes,' said Mr. Wapper.

"'A lover of mankind is a filantropist, therefore a flirt, being a lover of mankind, is a filantropist,' said I.

"'Then you are a great pilantropist, for everybody knows you're a flirt,' said he.

"In the evening we went to church, when the Rev. Professor Wordsworth preached upon the great image of Nevercouldiknowsir. Last week Aliesir Smith called to ax me whether I thought you wood give her another character as cook to Mr. Funks, for she has left Professor Newton Coovier Snooks's place as kitchenmaid. Mr. John Bull, of Bashan, Esquire, left his card for you, but Messrs. ABraham, Isack, and Jacob, the watchmakers, haven't sent your ticker home yet. Aliesir Smith still follows James Fudge, the beggar, or, as he calls himself, the asker.

"Now with many pardons, my dam, for faults of spelling and sense, I remain your humble servant,

"ANNO DOMINI."

"What a quaint, amusing letter, Mrs. Pigge Wiggins. Your servant must be a very clever woman to make such ingenious blunders."

"I quite think so. She takes a great deal of trouble with her letters, because she knows I enjoy them. I daresay you wonder that she signs herself 'Anno Domini.' Her name is Anna Masters; but a schoolmaster once jokingly told her that her name in Latin was Anno Domini, and she, taking a fancy to it, adopted it in her letters to me. I would not put up with her writing to me in such a manner for a moment were she not an Irish woman."

After a tolerably long tour, and seeing everything that was worth seeing in Europe, we returned to America, and I brought with me the finest library I believe that has been imported from Great Britain for many years—in fact, all the books published that are worth having.

EARLY GREEK PEOPLING OF BRITAIN.

Part II.

(Continued from page 233.)

The Bardi or Poets, among the ancient Britons, preceded the Druids. According to Strabo, Posidonius and Festus, they sang the praises of heroes. Diodorus calls them the composers of verses only. They used only two musical instruments; of which the cynira had ten strings and was played on with a quill. The nablium had twelve strings, and was played with the fingers. This reminds us of the psaltery and harp of the ancient Hebrews (Psl. xxxiii. 2); the psaltery being characterised as an instrument of ten strings. These bards were at first, says Sammes, no doubt a religious order, singing the praises of heroes at their apotheosis, which in ancient times was not only esteemed glorious for the dead and useful to the living, but a glorious and acceptable act to the gods. This custom was clearly derived from the East, most probably from Palestine, from whence the Phœnician and Hebrew elements in their population came. The ancient Greeks had their whole theology in verse, suitable for singing. Thus Pindar says—

"Homer and I find bards in Delos' Isle.
Sang in new hymns and new composed lays
The golden-haired Phœbus Apollo's praise."

The Greeks got their civilisation from the Phœnicians, and the two natures together brought it to Western Europe, particularly to Britain. The Bards at one time predominated in Britain; they held the doctrine of the immortality of the soul, the order and harmony of the spheres, and sang the praises of the gods, foretold future events, and practised magic and necromancy. The Druids, to a great extent, succeeded the Bards in their influence over the people. Seldon, in his "Janus Angl." lib. 1, page 32, thus describes them from their old statues found at Wichtelberg, "Erant sex numero lapideas dicis antiquas imagines ad radices Piniferi Montis Wichtelberg vulgo in viciniâ Voitlandiæ, in Cœnobio quodam sibi visas quas credit ionicè Druidas præhibere, a fores Templi parieti insertæ, vii pedum singulæ nudis pedibus capita intectæ, Græcanico Pallio et Cucullato, peruláque, barbara ad inguina usque promissa, et circa naris fistulas bifurcata, in manibus liber et Baculus Diogenicus, severa fronte, et tristi supercilio, obstipo et figentes lumina terris." These statues were six in number and were discovered at the foot of a mountain abounding in pines at the Confines of Voitland. Conradus Celtus thus

describes them—"at the gates of the temple there were placed, seven foot in height, bare-headed, their heads covered with a Greekish hood, or cukil, with a budget by their side, and a beard descending to their very middle, and about their nostrils, plaited out in two divisions. In their hands was a book and Diogenes staff, which is supposed five foot in length; a severe and morose countenance, and a forehead down-looked and sorrowful, and much intent upon the matter, their eyes fixed upon the earth."

In illustration of this quotation, Sammes gives a copper-plate representing a Druid in accordance with this ancient statue.

Selden thus refers to their golden ornaments and painted garments:—"Quod ut cum iis quadrat quæ decorum, aureis ornamentis tinctis vestibus, armillis vasis Britannorum genis et mento, atque id genus aliis à Cæsare et Strabone recensentur viderit quorum interest." That our knowledge of the Druids is so limited may be attributed to their committing nothing to writing. According to Sammes, "their way of delivering their secret cabbala savours of the Jews learnt from the Phœnicians, who taught it also to the Greeks, but longer preserved in Britain than in Greece, so that to the days of Cæsar the commonalty were kept in ignorance unless admitted of this order." Their public records were preserved in the Greek tongue, and in Greek characters, which being unintelligible to the vulgar, none could have recourse to them but persons of repute and learning ("Cæsar's Commentaries," lib. I.). The Government of Britain, as regards its civil affairs, was much subdivided, but its ecclesiastical or Druidical authority was universally felt over the whole island, and even extended into Gaul. The Druids were subject to two Primates—the one resident in Anglesey, the other resident in Man. This system had its origin in Palestine, being a development of the Bardic system, imported by the Phœnician ships. The Druidical Primates were elected like the Popes of Rome, and from amongst themselves. Druidism is no doubt the nucleus of Popery and monasticism, and was the source also of Shamanism in Siberia, and Buddhism, although in the latter case very extensive alterations were made.

The competition for the office of Druidical Primate being very keen, the secular power was often used to direct the choice, just as the Princes of Europe endeavour to secure the appointment of their favourites as Popes. They issued excommunications, which, according to Cæsar, lib. VI., was reckoned the greatest punishment that could be inflicted. The excommunicated being reckoned profane, wicked wretches, were not admitted to sacrifice, were avoided, and held moral lepers, incapable of honourable office, and excluded from the enjoyment of property and civil rights. The Druids being judges of all controversies, both civil and criminal, used their immense power for the enslaving of the common people, in which they may remind us strongly of the Jewish High Priest and Sanhedrim, at one time in possession of a large share of the civil power, although usually under it. Human sacrifices were frequent, and either consisted of persons taken in war or of their own population, either malefactors or innocent persons. In this manner they established a reign of terror, as was the case in Jewish history, when the iniquities of the people were come to the full: through ecclesiastical corruption the nation was given over to conquest and spoliation by the Romans. This was in the east, and in the west nearly at the same time in Gaul and Britain Druidism was broken down by the same Roman power. The Druids were exempt from the service of war, and were free of taxes; they

held the oak-tree and mistletoe in great veneration, the latter of which they cut down with a golden bill-hook. (Pliny's Nat. Hist., lib. xvi., cap. 4.) They planted many oaks in Britain. They were called Saronides, Σάρων, or Σάρωνις, signifying the same as Δρῦς in Greek; Derw by the Britons, and Deru by the Armoricans, which means an oak. When the mistletoe grew on an oak it was considered a proof that the tree was especially sacred. In Isaiah i. 29, Israelites who had embraced the idolatry of Canaan were to be "ashamed for the oaks they had desired." When the moon was six days old, they began their months and new years, and counted cycles every thirty years. Selden notices that Τενεὰ, according to Heraclitus and Herodotus, was by the Greeks included in the same measure of time. Having led two milk-white young bullocks under the tree, it was climbed by a priest, clothed in white, who cut down the mistletoe, to be received below in a soldier's white cassock. The animals were then sacrificed with many prayers, and the mistletoe was esteemed a remedy against all manner of poison and barrenness, both in man and beast. In the present day the mistletoe is a Welsh cure for St. Vitus's dance, which was instanced by Mr. Moggeridge in a paper read before the British Association at Bath in 1864. Sheringham, in his De Orig. Angl., notices that the Greek Δρύαδες and Hamadryades were of the same origin as the Druids, but that the Greek Druids were of the female sex only—vestal virgins living in the groves and deserts; whereas the Druids of Britain and Gaul were of both sexes. The nymphs of Greece, half goddesses, were mere women who acquired a sacred character from their seclusion, and became elevated to a high position, an important fact in mythology, through the ingenious fictions of poets and writers. It was the imagination of Greek writers that gave to the lives of men the character and attributes of gods; this is the key to Greek mythology; and the same key, with a very little alteration, will unlock the mythology of every nation. It is of the nature of a historical novel—a work of fiction, founded on fact, often allegorically true, when literally false.

The Druids were of opinion that the life of a man endangered by sickness or war, could not be secured unless another suffered in his stead, so that in such a case, according to Sammes, page 104, they either offered men in sacrifice, or else vowed to do so after their delivery. The most acceptable sacrifice to their gods, they deemed murderers, thieves, and robbers, and also other criminals—a custom common to the Druids of Britain and Gaul. They made a statue or image of a man in vast proportions, whose limbs consisted of twigs, weaved together in the nature of basket-ware; these they filled with live men, and after that set it on fire, and so destroyed the poor creatures in the smoke and flames. Sammes gives a copper-plate representation of this description of awful sacrifice in the name of religion. The Palestine nations, Israelitish, Moabitish, and Canaanite made their children to pass through the fire to Moloch, Chemosh, and Milcom. See 2 Kings, xxiii. 10—13; xxi. 6. Britain, according to Camden, was the home of giants, another argument for the Phœnician origin of their people, for the Israelites dreaded Canaan as the special dwelling of giants. Havillan, the poet, who lived about six hundred years ago, thus describes them—

Titanibus illa
Sed Paucis famuloso domus quibus uda serarum,
Terga dabant vates, cruor haustus pocula trunci
Antra Lares dumeta thoros Cœnacula rupes
Præda cibos raptus Venerium spectacula cædes

Imperium vires animos furor impetus arma,
Mortem pugna sepulchra rubus; monstrisque gemebat
Monticolis tellus: sed corum plurima tractus,
Pars erat occidui terror majorque premebat,
Te furor extremum Zephyri Cornubia limen.

Here giants lodged, a brood of Titan's race,
Raw hides their clothing, blood their drinking was,
Their cups were hollow trees, their houses dens,
Bushes their beds, their chambers craggy pens,
Hunger with prey, their lust with rapes they eased,
The sport of slaughtering men their eyesight pleased.
Force gave them rule, their rage did arms supply,
Being killed, in groves instead of graves they lie,
These monsters every quarter did molest,
But most of all the Cornwall in the West.

The Britons used boats made of a sort of wicker-work called Coracles, which remind us of the ark of bulrushes in which Moses was placed and the Ethiopian people mentioned in Isaiah xviii. 2, that sendeth ambassadors by sea, even in vessels of bulrushes upon the waters.

Herodotus mentions that the Egyptians made a drink with barley similar to beer, and it is well known to be of ancient date, and beer is used in Palestine in the present day.

The people of Syria make clotted cream similar to that used in Devonshire, another instance of the preservation of an old eastern custom in the west. Ale was called by the Britons "Kuzu," by the Gauls "Kormá," by Dioscorides κύρμ, by Marcellus "Curmi." The Tartars call fermented liquor made of mare's milk Kümis. It is reasonable to infer that these names applied to fermented liquors are connected. The name Thomra, the Phœnician word for wine, resembles Kormá in all but two letters. Another ancient British custom, as related by Selden, was a trial by ordeal of the wives of a man suspected of having been killed by them with fire, another torture. Sir Edward Coke considers this the origin of burning women that murdered their husbands, which was in modern times the law of England. The Britons, according to Cæsar's Commentaries, did not esteem it lawful to eat the hen, the hare, or the goose. They made a close distinction between the clean and the unclean, objecting to eating fish, which may well be considered to have been borrowed from the Mosaic ritual.

According to Cæsar and Strabo they ate venison, fruit, and milk, but they did not make cheese. According to Dio Nicæus, as quoted by Sammes, page 110, "they would stick themselves in bogs up to their heads and there continue many days together without sustenance, and upon occasion returning and hiding themselves in the woods they fed on the bark and roots of trees, as the Indians at this day are wont to do"; but I cannot imagine what that meat should be which Dio says they preserved on all occasions, whereas if they eat but the quantity of a bean it satisfies their hunger and thirst.

Diodorus Siculus says the food they eat was simple, not dainty, consisting of corn which they thrashed as required for immediate use. According to Pliny they manured their grounds with marl, whereas Dio Nicæus says the Northern Britons tilled no ground. From this it is clear that the southern parts of Britain were well cultivated, for the marling of soil is an indication of good farming and old-established agriculture; even civilized Europeans do not pursue it in their newly settling colonies. These various statements of divers habits were no doubt true, but were applicable to different tribes or persons living in different localities whose definition and distinction is extremely difficult with the scanty historical record which has descended to our time.

According to Sammes, page 180, it is manifest "there were two sorts of the Britons, one of whom was more civilized, namely, those that lived upon the sea-coast, and, as Cæsar said, they of Kent exceeded all the rest. These had sumptuous houses, gardens, and orchards, after the manner of the Gauls. They did not go naked, but had their apparel after the custom of the same nation. They were daintier of their diet, having particular dishes in great request among them, and positively not superstitious in the eating of hen, hare, or goose, as the Chenorotes their delicate diet may witness. Another sort of people were in this island; these had no houses or cities, not because they did not know the use of them, but because the circumstances of their lives did not permit them to build any living; constantly in war and making daily incursions upon their richer neighbours so that they that had built would have been daily subject to spoil. And it could not be but altogether against their design to settle themselves in any fixed habitations, whose business was to range about at liberty—whose livelihood depended upon sudden excursions, private and obscure retreats."

Sammes, quoting Strabo, says, "their woods stood to them instead of cities and towns; for when they, by felling of trees, encompassed and fenced a spacious round plat of ground, there they built for themselves huts and cottages, and for their cattle set up stalls and folds, all for the present use, and not to stand long, just after the manner of the Cossacks in the Ukraine, who, although they are daily exercised in the sieges of great and sumptuous cities, and know all the arts of building and fortifying, yet live exactly after the manner of these Britons, retiring into these tabors, made like the British holds described by Cæsar, fenced in with trees, and trenched about with ditches and ramparts, into which they draw all their cattle and carriages, the necessity of their condition being much the same as these Britons."

"Being attacked by the Polanders lately, they retired into their bogs and fastnesses just as the Britons did, living upon barks of trees and enduring the same hardships, so that we must not esteem a people barbarous for those customs which the necessity of their forced condition, not ignorance, leads them into. These were the Britons which tilled no ground, because they tarried not so long in any place as to expect a crop. They went naked, keeping no sheep, a creature slow in motion, and apt to be surprised, besides subject to beasts of prey, as wolves and foxes, which were in great number in the woodland county of this island. They made no cheese as it was heavy in carriage, but satisfied their hunger with the prey of venison and natural fruits of the earth. It had been a piece of madness in them to have made delicate gardens or planted curious orchards where they could not tarry so long as to enjoy the fruits and pleasures thereof."

"These inland Britons as they succeeded the sea coast as Gaulish Britons, so I believe they were in perpetual hostility with them, being as may be conjectured of quite a different origin; the customs of these Islanders exactly corresponding with the German nations that Cæsar describes, which customs of the Germans I will set down in his own words, because it seems to be an exact description of these Britons, and may partly evidence the primitive inhabitants of this island not to have been of the Gauls but German race. 'The Germans spend their lives in hunting and in the military affairs from their youth; they give themselves to labour and to endure hardship; they cover half of their bodies with the hides of rhenos; they take little or no notice of tillage; the greatest part of their diet

is milk, cheese, and flesh; they have no measure or certain bounds of lands, lest by tillage they should forget the use of arms; they build no curious edifices to keep out cold or heat, lest the more powerful should drive out the weaker; they keep their people in unity by making all things common.'"

The remarks of Sammes and his quotations from Cæsar are very much to the point, and still further confirm the belief in the existence of two distinct races in Britain previous to the advent of the Romans. The predatory migrating Britons appear to have been a Finnic Hyperborean people. The settled civilized Britons, a race akin to the Germans, but like them of Asiatic origin, among whom was infused elements of Phœnician and Greek, in what proportion these various nationalities were commingled it is perhaps impossible for us to determine. The attempt to make the Britons in Cæsar's time as a whole painted savages is a folly and a fallacy quite unsupported by the ancient classic historians, although it is clear that some of the people stained themselves with woad. Cæsar says they used to dye themselves with woad to make themselves more terrible in battle. They tattooed themselves with the figures of beasts, as our sailors now do.

On the subject of woad, Pliny says, as quoted by Sammes, "There groweth a herb in Gaul like unto plantain, named *glastum*, that is woad with the juice of which the women of Britain, as well married wives as their young daughters, anoint and dye their bodies all over."

Solinus, on the subject of tattooing, says, "The country is partly peopled with barbarians, who, by the means of artificial incisions of various forms, have from their childhood sundry figures of beasts printed upon them, and having these characters deeply engraven on their bodies as the man grows in stature so do these painted characters also, neither do these savages think anything shews their courage more than undergoing these lasting stars by which their limbs drink in much paint or colour."

The inhabitants of North Britain being perhaps those who longest preserved the habit of painting, were termed by the Romans Picts, from the Latin Pictus; but the influence of the Romans gradually penetrated even to the remotest parts of Scotland. Hence we see in the dress of the Highlanders of Scotland, but a slight modification of the Roman Imperial costume, such as is preserved to us in ancient coins, gems, and statues. That there were among the Britons men highly civilised for the remote age of which we are writing is certain from the fact that the Gauls sent their children to Britain to be instructed in the mysteries of Druidism (see Cæsar's Commentaries). The same writer speaks of the wisdom and good nature of Comius, the Briton, and of the skill and science of Cassibelan, the British general. But when the British civilisation was subdued and that of Rome took its place, its more perfect organisation and means of communication with a great centre and the fact of the historians on whom we principally rest for information being commingled with it, have caused such a concentration of light about the Roman name as to shroud the civilisation of ancient Britain in such darkness, that it is only by the aid of light gained from these sources that we can ascertain a few facts of British contemporary history.

St. Hierome speaks of a British nation named Altacotti that fed on man's flesh, "nay, so much were they given to it that when they lit on flocks of sheep or herds of cattle, they prefer the buttock of the herdsman or keepers before the other prey, and accounted the paps and dugs of women the most delicious diet." This is incredible of any nation either

ancient or modern, and could only apply to a monster such as Sawney Bean who, in Galway, in mediæval times, lived in a cave and fed on the flesh of travellers passing through that district.

Before leaving the subject of the painted savages, it may be well to quote Sammes on the subject of words connected with colours and applied to men.

Thus, Coch or Goch, red in the British tongue, is seen in cogidunus, argentocoxus, segonax.

Du, black, is seen in mandubracius, cartismandua, togadumnus, bunducia, cogidunus.

Gwin, white, in venutius immanuentius.

Gwelw, a wan or waterish colour, appeareth evidently in vellocutus, carvillius, and suella.

Glass, blue, in cuniglasus.

Aure, a fair yellow or golden colour, in arviragus cungetorius.

Ceg, a lively and gallant colour, in Prasutagus and Caractacus.

"But," he says, "if the Britains borrowed the names of mingled colours together with the very simple colours themselves, then from

Prassius, leek-blade-green, come prasutagus.

Minium red, vermilion, Acliminius, King Cenobelin's son."

These instances Sammes quotes from Camden, but proceeds to argue that "It is confessed the Britons did take many names of colours from the Romans, as Werith, for veridis, green; melin, for Melinus, that is a quince yellow colour; Aure, from Aureus, a golden colour; because perhaps the mixture of these colours was taught them by that nation. But where does Mr. Camden read that the Britons ever painted themselves with such divers colours, seeing he brings in many names of persons so coloured who never had anything to do with the Romans but were always in hostility to them?

"The ancient Britons, according to Strabo, were taller than the Gauls, their hair was not so yellow, nor their bodies so compact, knit, and firm, but had bad feet to support them; and he said he saw divers youths at Rome made after that proportion, but as to other lineaments, well made and of excellent features."

On comparing the figures of the modern inhabitants of Britain and France, the British will be found the taller and the better made, more especially about the feet and legs. The emperor, Frederick I., on meeting Raymond Béranger, second Count de Provence, at Turin, 1154, in return for complimentary verses from Troubadour poets, thus addressed him:

"A Frenchman I'll have for my cavalier,
And a Catalonian dame,
A Genoese for his honour clear,
And a court of Castillian fame;
And the Provençal songs my ear to please,
And the dances of Trevisan;
I'll have the grace of the Arragonese,
And the pearl of Julian,
An Englishman's hands and face for me,
And a youth I'll have from Tuscany."*

Englishmen of the 12th century were especially famed for their beauty in the hands and face. Herodianus speaks of the Briton's wearing on their bellies and necks rings of iron, which were no doubt the torques of Celtic antiquarians. Cæsar says that iron rings and brazen pieces probably what are now known as ring money, as found in Ireland and represented on Egyptian monuments; this ring money was doubtless introduced from Phœniceà, and was analogous to that which Abraham weighed for the purchase of the field of Machpelah. Strabo speaking of British trade, mentioned a traffic in furs, which, with tin and lead,

* Translated from the Provençal in Sismondi's "History of the Literature of the South of Europe," Bohn's ed., vol. I, page 86.

were exchanged for the earthen wares, salt, and brazen vessels of the Phœnicians. It is not possible to doubt that some of the fragments of bronze vessels occasionally found in London and attributed to the Roman period are much older, being probably of Phœnician or Greek manufacture. The same may be said of some of the black and red earthenware. According to Cæsar they wore the hair of the head and upper lips long. According to Plutarch they sometimes attained the age of 120 years, and according to Strabo and Solinus they were of a fair and good disposition. Their women were remarkable for beauty, and led the men in war; had great wealth, and cultivated land, and had large herds of cattle. The Britons like the Gauls began their day at sunset, and not at sunrise as did the Romans. Thus they spake of Withnos, that is, eight nights, and Pimthec nos, or sixteen nights, in accordance with the mode of reckoning in the first chapter of Genesis, where the night preceded the day. This mode of reckoning may be a considered a conclusive proof of their intercourse with Palestine people. The Britons also observed the new moon. The Britons gathered a herb called Samolus, now supposed to be the Samolus valerandi of Linnæus, a small aquatic plant with a white flower. The ancient Druids gathered this plant with much ceremony; they did so fasting, plucking it with the left hand, from whence it is supposed to derive its name, from Samol signifying the left hand in the Phœnician language. It was used as a certain cure for diseases in swine and cattle. One of the principal articles of dress worn by the ancient Britons was what Varro called Gaunacum, from whence the word gown is derived, it was worn on the body and was of coarse wool, and had a nap on both sides resembling a frieze, it was called by the Greeks Καννάκη, and was said by some to be of Persian, and by others to be of Babylonish origin, and was probably introduced by the Phœnicians. The garment according to Sammes was of divers colors woven together and made a gaudy show, which reminds us of Joseph's coat which was of many colors, and was worn in Palestine the home of the Phœnicians.

Tacitus in describing the Silures spoke of their black and curly hair, and of their differing from the rest of the Britons in their swarthy countenances. He considered them to be of Spanish origin, the descendants of the Iberi, skilled as miners. This is a very important fact to remember. In the mining districts of Britain in the present day the people are darker haired and have a more oriental cast of countenance than those in the more agricultural districts, and are more violent than they are. From their physical appearance as well as from their moral character, it seems probable that the Phœnician blood is more concentrated in them than in other parts of the population. The vices of the Canaanites, as well as their mechanical talent, are perpetuated with the modification which a different climate and vast ages might be expected to induce. The Britons of the west wore long robes and carried a staff. Diodorus also speaks of their plain and upright dealing, without the craft and subtlety of other nations. Some of them, according to Cæsar's commentaries, were polyandrous in their matrimonial relations—a tendency which is also shewn in the shakers of the present day.

The Britons were a warlike people, whose quarrels were fomented by the numerous petty states into which the government was divided. Sammes quotes an ancient author thus: "that everyone delighted in picking quarrels, that it was their daily exercise and pleasure to be skirmishing, that they were continually going out in parties, fortifying and entrenching, many times

out of delight rather than from any necessity," page 119.

Keeping standing armies they repeatedly exercised them in order to maintain discipline. There were constant wars between the different tribes, presumably the more intense, when the parties fighting were the aborigines, and more recent settlers in Britain. These divisions in the country rendered it open to the conquest of a disciplined force like that of the Romans. Yet the strength of the people was considerable, so that Cæsar's conquest was not so easy as he expected. Reference has been already made to the habits of the Britons in fighting in chariots, and this was probably of Phœnician introduction. These chariots were called Benna Carrus or Carrum, Covinus Essedum and Rheda, all Phœnician names, hence we may take it to be conclusively proved that they were of Phœnician origin. The Greeks modified these vehicles, calling one with four wheels Petoritum, and changing the name of Rheda into Epireda. Many of their chariots were armed with scythes, with the object of cutting their way through the enemies in time of battle. These were the sort that were called Covinus, Whence the British word cowain. *i.e.*, to carry in a waggon; waire is the synonym for waggon. The Essedum of the Phœnicians, Σζήνη of the Greeks, was a war chariot, for the conveyance of armed men. According to Cæsar the Essedarii or Charioteers rode through the battle throwing darts at the enemy, and were formidable both from the noise they made and from the terrible appearance of their horses. They appear to have used their chariots principally as a means of bringing them into the field of battle, for leaping from their chariots they fought on foot, with the exception of the drivers, who guided the chariots out of the heat of the battle. This manner of fighting gave Cæsar some trouble, and caused him to be often beaten. The cari appears to have been the origin of the modern cart.

The names applied to the weapons used by the ancient Britons are but little known, but those of the Gauls, whose intercourse with them was apparently very close, were Spatha, Gessum, Lancea, Sparum, Cateia, Matara or Mataris, Thyreos, Cetrum or Cetra. The Cetra, according to Tacitus, was used by the ancient Britons, and was derived from the Phœnician Cetera. The Spatha, called by the Italians spada, and by the Spaniards espada, according to Isidore, was a two-edged sword for cleaving rather than thrusting; for, according to Polybius and Livy, it had no point. The Britons wore daggers, which have been supposed to be derived from the Chaldee word sphud, signifying a spit, which the Italians call spedo, and the Dutch spett, and the English spit, and the German spiftz. Sparum, another Gaulish weapon, is probably derived from sparon, a Phœnician word from the sapar, from whence comes sophson, *i. e.*, an iron edge. Isidore informs us Cataia was a weapon of soft metal, a heavy javelin, of crushing weight. Sammes thinks this derived from the Phœnician *catat*, signifying to break in pieces. Lancea, according to Festus, was derived from the Greek Λογκὴ, and may be assumed to have been imported from Greece. The Matara, which Sammes supposes to be the darts flung out of their chariots, were called also mataris and materis. According to Strabo it was the same as the weapons called palta; according to Pollux, paltum was a Medish dart. An Oriental origin may therefore be inferred for all these weapons.

It might not be out of place to add a few words to what has been already said on the gods worshipped by the Britons, which, according to Cæsar, and other classical writers, were identical with those worshipped

in Gaul. In central France there was an annual great assembly of Druids from Britain and all parts of Europe, where the influence of the sect penetrated, which was occupied with the hearing of causes and the settlement of the affairs of their religion. It was an international Congress in which the British had anciently great influence; for they were held to be the most advanced nation in the mysteries of the Druidical religion. Apollo, Minerva, Jupiter, Mars and Mercury, gods of the ancient Greeks, were worshipped in Britain, but under different names. Sammes says, page 126, "Jupiter was worshipped under the name of Taramis, or The Thunderer, and Taran or Taram signifies, at this day, in the British tongue, thunder, as Donder in the German, and Thor in the old Swedish tongue, from whence the Germans call Jupiter's day Donders-dagh, the Swedes Thors-dag, and we Thursday." Adam Bremensis, of the Swedes, writes, that they held Thor to rule and govern the air, and from him proceeded thunder and lightning, winds and storms; likewise that he gave fair weather, and brought forth the fruits of the earth; likewise in another place that he was made holding a sceptre in his hand, and was esteemed the same as Jupiter, the king of the gods, in which sense he was called in the Phœnician tongue Moloch. It is observable that as the Canaanites (of which country Phœnicia was a part) offered human sacrifices to that God, making their children to pass through the fire; so likewise did the Gauls and Britons to this Taramis or Thunderer, whose very name in another place we have shown to be the Phœnician Tarem in their tongue, signifying thunder. Of this god Lucan thus writes—

"Et Taramis Scythicæ non mitiorara Dianæ." Upon the altars erected in honour of this Jupiter, the British blood was often poured out in great abundance, but perhaps more in Gaul by reason that their country is more infested with sudden thunders and violent storms, that they often invoked that power under whose hand they lay than the Britons who enjoyed a more temperate and evener weather. And although to this god, as likewise to some others, they offered for the most part heinous and notorious malefactors, yet oftentimes the innocent natives suffered, and men for their health, in some dangerous sickness or upon some great necessities and straits in war, often vowed to sacrifice human offspring, which vows they were obliged to perform at their recovery or deliverance." "This custom, together with the name of this God, Taramis, was brought in by the Phœnicians, who are described by Havillan, the poet, writing of their race in Cornwall, that their spectacula or public games in honour of their gods were the slaughter of men, and not only so, but they drank their blood. Neither did the Druids (who were otherwise men of civil and upright conversation) alter these bloody ceremonies, because it is to be supposed that they came out of Greece in these early days, when the sacrifices of men and women was also practised in that nation. Another god they had named Tutates, and him they had in special honour above all the rest. He was esteemed the god of travelling, and by the Britons may be supposed to be called Din Taith, the god of journeys, and the great honour they gave him above all other deities, is conjectured by some to be a sign of the Britons' peregrination from far countries, and upon that account they so particularly honoured him as their guide and leader. By Livy he is called, Mercurius Tutates, where he writes, "that Scipio turned up to a mount called Mercurius Tutates." By this it appears that the Britons and Gauls did cast up

mounts, and consecrated them to his honour, especially where many ways met. Upon these ascents of ground there was frequently erected a statue of Mercury, which pointed out the different ways, or if there was no statue, yet the place was called a Mercury from the advantage of ground which gave them opportunity to discern out and descry to what parts the different ways would lead them. These places they called Mercuries, sometimes with an addition of some other of his names, and oftentimes of a town or village, hill or river adjoining. But seeing in Livy the name Tutates is added to Mercury or Hermes (for so he was called without doubt by the Druids). I am induced to believe that Tutates hath some other original than Din Taith, or the god of travelling, because it seems a kind of tautology to put two names together of the same signification; this Tutates, therefore, is to be referred to the Phœnician Ta-autus according to Sanchoniathon, the most ancient Phœnician, cited by Philo Biblius Ta-autus saith he was the son of Misor, he was the first inventor of letters." The Egyptians called this god Thoot, and the Alexandrians Thouth, the Greeks, Hermes or Mercury, Plato Theut, Tully, Thoyth or Theuth, Lactantius, Theutus and Thot. I am inclined to believe that this Tutates was the origin of the name Teuton, who would naturally be called Teutons after a god they worshiped. Tutates some think to be the same as the German Tuisco. Mars was worshiped by the Gaul and Britons under the name of Hesus, which is derived from Phœnician, Hizzus, a name applied both by the Phœnicians and Britons to Mars. Mars among the Gauls was called Camolus, or Camulus, which signifies in Phœnician a lord or governor. Camden mentions a coin of Cunobelinus exhibiting a helmeted head and spear, and the letters Camu. From Camulus was also derived Camalodunum or Marshill, now Maldon in Essex. Another coin of the period has an ear of corn and the word Camu.

It is probable that Diana was worshipped in Britain, but it is not quite certain whether this was done till the Roman period (see Camden and Sammes). Minerva is believed by Sammes to have been worshipped by the Gauls, under the name of Onvana. Minerva was called Duca and Duga by the Phœnicians, as in Stephanus. Now, changing the G into a V, as walls for Gauls, or wave in English wage, in high Dutch and French we have this very Phœnician name of Minerva, which was metamorphosed from Onvana. Near the site of Bath Abbey Church once stood a Temple of Minerva. The Britons, according to Strabo, worshipped Ceres and Proserpine with the same ceremonies as the Samothracians (lib. IV.). These people are believed to have derived their worship from the Phœnicians. According to Bochart, as quoted by Sammes, these British gods' names were of Phœnician derivation. Thus:

"1. Axieres Ceres, in the Phœnician tongue Achzi-eres, as much as to say the earth is my possession.

"2. Axiokersa Proserpina, in the Phœnician Achzi-cheres, my possession is death, she being the Queen of Hell.

"3. Axiokersos, Pluto, the King of Hell.

"4. Cadmilus, Mercury, in the Phœnician language Cadmel, the servant of the gods."

Such is a brief *résumé* of the facts I have been able to collect relative to the ethnology of the Britons and their connections with the Greeks. I have materials for papers on their relations with the Romans and Saxons, but these must be reserved for another occasion.

C. O. Groom Napier.

ON THE THREATENED SUPREMACY OF VEGETARIAN WORKMEN IN THE INDUSTRIES OF THE WORLD.

CHINA, the greatest hive of the industrious bees of the world, is now sending forth swarms to the west, which settling in the rich and productive fields of California, and other divisions of the United States, compete successfully and displace European or native born operatives. If we enquire the reason of this, we find that the Chinese emigrants are vegetarians, and the vegetarian diet is a cheaper means of supplying the wants of man than a flesh diet. Not that the Chinese is a vegetarian on principle in all cases, but he is so in practice.

China may indeed teach England, America, and other European States, many lessons. In no country is the soil more productive; in none is it more highly cultivated. China is not a land of sewers, the waste of the living is as quickly as possible applied to replenish the exhaustion of the soil, which is irrigated with perhaps more care than in any country in the world. In most seasons, both in England and America, there are periods when the production of green crops in particular, would be very much increased by irrigation at the right moment.

Notwithstanding the boasted scientific agriculture of Britain, we are far behind the Chinese in appliances for irrigation. If English labour is too expensive, surely Chinese labour, vegetable fed, would not be too expensive to cover many rocky hill sides and stony moors with soil compounded of loam, sand, and humus for the planting of crops. One Chinaman might procure food in this way for three white men, but could not Englishmen follow the example of Chinamen and cultivate these waste places to profit? Certainly, if they were content, like Chinamen, to live on a vegetable diet. British society has, during the last quarter of a century, been moving in the direction of an increased consumption of flesh. Consequently the rise in wages, which would with economy in diet, have made the artizan class capitalists, sufficient in combination to have competed successfully with the wealthiest capitalists in the country, has not benefited them as might have been expected, or produced any great development of the system of co-operative industry. But, on the contrary, the rise of wages has been a curse and not a blessing; it has served only to develop the liquor traffic, and to enrich those engaged in it. I believe that the additional capital, which since 1848, has been expended on the liquor traffic, will be found to bear a very precise ratio to the increase of wages amongst the labouring and artizan classes. It is to these wages that the liquor dealer looks as his main source of revenue. The Chinese labourer is to a great extent exempt from the temptation to which the European labourer is exposed, of exceeding in food and drink. He desires to rise in the world, and is aware that he can only do so by living within his means. Unlike the foolish European, who mostly lives up to his means. Therefore, if the European labourer is not to be beaten in the race, he must practice the self-denying vegetarianism of the Chinaman. Many will argue that the Englishman in general is so naturally self-indulgent and extravagant, that he cannot be expected, even by the hope of future comfort and independance, to practice that self-denial in early life, which leads up to it; and that the economy and the self-denial which

enable man to make himself, are found in the few rather than in the many. But the lessons which the history of the French and Germans teach us, shew that even economy may be taught by necessity to nations. The devastations and losses which the wars of Napoleon I. induced, caused a great increase in the natural economy of the French and Germans, so that in the late wars these countries were seen to be possessed of vast wealth, especially France, whose agricultural resources, mainly devoted to the production of vegetable food, are much greater than those of Germany. I maintain that, had the French peasant and artizan class, been as much addicted to the purchase of costly luxuries of food as similar classes in England, France would not have been able to pay so easily the enormous indemnity for war expenses which the Germans demanded. Were any great nation to consistently practice vegetarianism, that nation would be the preponderating nation on the continent where they were situated, since the vegetarian diet is that most favourable for health, economy, bodily vigour, and mental culture.

The *Daily Telegraph* in a leading article on August 4, 1876, says, on the matter of the emigration of Chinamen into the United States:—They now number fifty thousand. They competed actively with white men in many trades, and were independant of trade unions or other conventions. In California their numbers caused them to be still more dreaded and hated than in the Eastern States. In Massachusetts they were superseding whites in boot-making; at Beaver Falls, Pennsylvania, in cutlery. When the whites struck at Beaver, Chinamen took their place at half the wages; in vain the whites petitioned congress to prohibit the employment of Chinamen, but a greedy appetite for cheap labour prevented their petition from being granted. Unless legislators are prepared to enact severe protective laws, or the white operatives are prepared to adapt themselves to the altered circumstances, much misery is sure to ensue. The prophesy of old Noah is on the point of fulfilment, "God shall enlarge Japhet, and he shall dwell in the tents of them, and Canaan shall be his servant." The European kindred of the Jews represent Shem. The Mongolic races, of which the Chinese are the most important, represent Japhet. The wave of migration from the overcrowded Chinese race has set towards America; it is a natural law that currents flow in contrary directions, according to time and place. It requires a master mind to know how to utilise this important turn in the tide of nations. It is indeed "the tide which, taken at the flood, leads on to fortune," or it may be to ruin.

The corollary of all this is, that the Englishman and American, who by their superior energy and intelligence much surpass the Chinaman, as workmen, should render his presence unnecessary and unsuccessful as a competition, by emulating him in the economy of food. The same lesson requires to be taught in the British Colonies, where European emigrants seek a home; in the mother countries that they leave, and in the United States.

TOBAGO AS A COMMERCIAL COLONY.

THE island of Tobago has been long famous for its fertility and for its productive capacity. In 1763 a treaty was signed at Paris by which the British Crown definitively established its claim to the Island of Tobago. In 1764 the British took possession of it and the island was surveyed and sold by auction, sugar plantations were commenced, and in 1770 the value of the exports, principally sugar and rum, according to *Southey's Chronological History of the West Indies*, Vol. II., page 407, were "from Tobago to Great Britain £451,650 8s. 3d.; to North America, £51,061 7s. 6d.; to the other islands, £671 10s. This is more than any other West India Island produced at the time, with the single exception of Jamaica, whose large size rendered it an unfair comparison. Thus the exports from Jamaica, in 1770, amounted to £1,538,730; from Nevis to Great Britain, £311,012; to America, £14,155; from St. Christopher's to Great Britain, £367,074; from Barbadoes to Great Britain, £311,012; to America, £119,828; and to other islands, £1,173; from Antigua to Great Britain, £430,210; to North America, £35,551 7s. 6d.; to the other islands, £229 10s.; from Montserrat to Great Britain, £89,907; to North America, £12,633; from the Virgin Islands to Great Britain, £61,696; to North America, £10,132 10s.; from Anguilla to Great Britain, £3,800; to North America, £2,057 10s.; from Dominica to Great Britain, £46,365 5s. 8½d.; to North America, £16,496 10s.

The population of Tobago at that time was less than at present. In consequence of the war with France the exports and imports decreased greatly in value, and the island got such a shock during the occupation of the French from 1781 to 1793 that it never was able to recover it, for with the return of peace there came the acquisition of fresh colonies by the British Crown, which, having the attraction of novelty induced capitalists and emigrants to give them the preference; but for this West India Colonies would be inhabited by a population of 100,000 souls, of wealth equalling the richest in Europe.

Tobago is a most interesting island to the smoker as having been the home of his favourite weed. Robert Montgomery Martin, in his *British Colonial Library*, Vol. IV., page 232, says, "The Island of Tobago, or Tobacco* was discovered by Columbus in 1496, and was thus named from its resemblance in form to the pipe used by the islanders in smoking the herb now so extensively used in the Old World, and then termed Kohibi. From this the word Tobago was derived. The bowl of the pipe is Man of War Bay, the mouthpiece is at Sandy Point.

Captain Poyntz, in his little book, speaks of the superior quality of the Tobago tobacco.

In 1642, the Duke of Courland colonised Tobago and planted a great deal of tobacco, which was said to have been quite equal to the best grown in the Spanish islands. The grandfather of the author had cigars made in his own plantation, which were pronounced by conoisseurs of the first quality.

On the first establishment of Tobago as a British colony in 1764,

* In an ordinance of the Governor-General of the French Leeward Islands, dated Martinico, 7th Dec., 1748, it is described as the Island of Tobago, commonly called Tobacco.

and the five years that succeeded, two millions sterling were spent on establishing the colony for the production of sugar and cotton. The annual value of the exports in 1771 was nearly half a million, which afforded the investors a profit of from 20 to 25 per cent. As has been shown, the ravages of the French, during the time they occupied and conquered the island, disturbed this prosperity, and the colony has never attained to the height of prosperity which it did in 1771. Still we have here a proof of what it was capable of producing even with the most clumsy instruments of husbandry, an inferior variety of the sugar cane, and a population much less than at present. Even in 1771 not a sixth part of the soil of Tobago was cultivated, although almost all the land was highly fertile and arable. In 1771 four times as much land might have been taken into cultivation had good implements of husbandry been used, so that crops of a value of nearly two million might have been produced. And but for the war with France this would in all probability have been accomplished. The present state of the colony is, however, what is really most worth examination. The ordinary system of the management of West India estates is bad; parties are the nominal purchasers who have little or no capital, even in the first instance, to pay the purchase money, which is advanced by merchants in England on the security of the consignments of the sugars, rums, and other produce of the estates. The proprietor has not merely the interest of his purchase money to pay, but a very heavy commission on the sale of the sugar, so that his chance is not great of being able to clear off the debt and become the free and independent owner of the estate. The merchant consignee in England, from time to time, continues to help the proprietor with advances of money for the cultivation of the estates; but, as the merchants are seldom men of much capital, they have not the means of doing more than maintaining the *statu quo* of the estates, even if they were their own; but they would not feel justified in doing much for another man's property, so that enterprise of every kind is checked, and an entirely new state of things must be inaugurated in order fully to develope the resources of a West Indian colony. There is no class of persons who are better acquainted with these facts than the planters and merchants themselves, who do not desire to imitate the dog in the manger, to prevent others from doing what they cannot do themselves. As far as Tobago is concerned, they feel that what the *Field* and *Bazaar* newspapers say is true:—"There is no island where money judiciously invested will produce larger returns. Capital judiciously invested may be expected to produce a return of 25 per cent., or even more. Limes may produce 30 or 40 per cent." "An acre of the best land in Tobago, cultivated in bananas, would produce a clear profit of £100 per annum."

That an acre of land in Tobago was capable of producing food to the value of £100 is an old opinion as old as the days of Captain Poyntz, who wrote about two centuries ago. The author has made close calculations which convince him that in several articles of produce at least £100 per annum per acre might be made of clear profit; but even one half or £50 per acre per annum would be satisfactory to the most greedy speculator.

According to Simmons's "Commercial Products of the Vegetable Kingdom," page 189, the cost of producing sugar was less in Tobago than in the colonies of Jamaica, Guiana, Trinidad, Mauritius, Bengal, Madras, or in any part of Europe; therefore the profit might be expected to be greater. Another special advantage in Tobago is the

absence of the white ant, which is the bane of the sugar planter in most other colonies. It is estimated that, at the present price of refined sugar, the cost of its production would be about one-half in Tobago, its wholesale price in London, which would afford a very large profit to the grower. This estimate is founded on the ordinary cane; but if the Otaheitan or Bourbon cane were used, or still better the Chinese cane, the profit might be much increased and assured on a firmer basis, it being comparatively independent of the rainfall.

Of the plantain or banana, Simmons says, page 324, that an acre of plantain ground, of average quality, would yield plantain meal of a ton weight, worth £112; but a rich soil would yield twice as much, or £224 worth per acre; about one-half might be calculated as clear profit. This plantain meal is far superior to arrow-root or revalenta arabica as a food for infants, invalids, or for daily use in puddings, cakes, or other culinary uses. The plantain fruit itself might be exported, as it is now popular in England. The fibre of the plantain leaf, which is usually thrown away in the West Indies, is the Manilla hemp. When these calculations were made, the price of the plantain hemp was £38 per ton; the cost of production was £9 13s. 4d. per ton. The old calculation that an acre of plantains would produce a clear profit of £100 might therefore be taken to be greatly within the actual profit of the cultivation and manufacture.

Of cocoa-nuts, Simmons says, for an expenditure of £960, a net income of £1,200 a year may be secured in the course of about seven years in any suitable locality in the West Indies. Tobago is eminently suited for the cocoa-nut. There is land in that island which might easily produce cocoa-nuts of the value of £40,000 per annum.

By the use of Fowler's steam-plough and traction engines, a great economy of labour may be effected. Fuel for the steam engines is procurable in the large supplies of wood found on the spot. The Island of Tobago is greatly covered by magnificent mahogany, ebony, green heart, lignum vitæ, and other timber trees, the wood of which is of increasing value. The author believes that this timber would more than pay the cost of cutting the trees down, and preparing the land and planting it with crops, so that any capital expended in this way might be very soon returned.

The exports from Tobago by the last returns (see the "Blue Book" of 1873) were about £94,000 per annum; but this, with the machinery specified above, might be expected to be increased five-fold.

POTTERY: ANCIENT AND MODERN.

(*Continued from page* 147.)

Part II.

GREEK AND ROMAN POTTERY.

A GREAT many vases have been found in Etruria which Mr. Chaffers considers so evidently of Greek manufacture that the name Etruscan is not correctly applied to them. Similar specimens have been discovered in the tombs of Magna Græcia, Sicily, Attica, and in the islands of the Archipelago. Mr. Chaffers divides these vases, which he considers all of Greek manufacture, into five periods: the Archaic earlier than the eighth century, B.C., and the remaining four periods intervening in succession until the eleventh century, B.C., when there was a great falling off. The best period of the art was that which immediately preceded the period of decline. The most ancient examples of Greek art in pottery have been found at Athens, Corinth, and other parts of Greece proper, though some seemingly as old have been found in the Island of Rhodes and in Italy. They are usually of very rude form, and painted with coarse figures of men and animals, or with irregular markings and stars. Those which are of the second supposed period, or a little later, are generally of cream-coloured clay, painted with red, or with black and red. They are of the shape known as amphora, ænochoe, or like what is called the alabastron, &c., and the figures painted on them are less rude. The next, or third period, shows a still greater improvement. The figures are much more artistic, and the outlines have been drawn with a sharper pointed instrument. Groups of men, chariots, and horses are depicted on them with grace and precision. But the best period of Greek art was that which Mr. Chaffers has divided, perhaps somewhat arbitrarily, into the fourth series, or period of the finest work. It is obvious that any chronological classification founded on skilled work is false, as skill is individual, and there are good and clumsy workmen in all ages. The drawing was made on the clay while it was still soft and unbaked. This had the advantage of giving facility for manipulation; but the work could not be effaced and retouched; as it was at first delineated so it had to remain. These specimens are painted with coloured clay, not enamel. The outlines having been traced, the ground was covered with the paint, leaving the figures in the original colour of the vase or other vessel in hand. The details of the figures were then filled in, according to shading and taste. Sometimes the figures are painted entirely, leaving the ground as at first coloured by the substance of the clay. Black and red are the prevailing colours, and the subjects are mythological, or derived from domestic life and outdoor games. The gods as well as the men are usually painted in the dresses of the time in which the work was done, so that as historical data they are useful. The greater number of the vases of this period were found in Etruria. Vases distinguished by bright black glaze have been found in Campania, at Nola. These are painted with red on a black ground. The black varnish is supposed to be the result of volcanic ashes, used as a paint; and then the vessel, on being exposed to heat, the ashes become partly melted, and formed a coating on the entire surface.

In the author's collection is a Nola vase of bright red; it is twelve inches

high, and has two small handles, with holes for string. It is ornamented with a scroll-leaf pattern in black, and is glazed all over, after the manner of some of the Samian ware.

The period of decline in this description of painted pottery, Mr. Chaffers places from the time of Alexander the Great, or about 300 years B.C. The Romans, in 186 B.C., issued an edict by which the feasts of Bacchus were forbidden, and this may have had a connection with the cessation of this kind of painting which frequently represented drinking subjects. There is, however, much which is mere conjecture in these hypotheses. It is however certain that these early painted vases became less common, and that those which on the best authorities are more ancient have greater beauty in design and execution, and have been done with greater care than such as belong to the time approaching the Christian period.

At a later period sculpture became more characteristic of ancient pottery. The vases were of finer and more striking form, and colour was chiefly employed to give relief to the raised work and form of the objects carved or moulded on the vessel. These vases are often too easily destroyed to have been useful in domestic life and are more purely ornamental. They are of terra cotta, not hard-baked, and are coloured in white or some light colour. They are sometimes as much as five feet in height, and with a spout and a handle which passes over the body of the vase. On the top of the handle there is sometimes a female figure, and figures of genii with wings support the handle. Various mythological figures sometimes ornament the sides and top part of the vase. These specimens have been found in Greece Proper, and they are sometimes called Cumæan or Apulian, from having been discovered in Cumæa or Apulia. Mr. Chaffers considers that these vases are most likely of the Roman period, even if they were done by Greek artists.

In the sepulchres of Etruria small quadrangular urns with covers about two feet long and about the same in height are found. They were made either of soft stone or terra cotta, and rarely of alabaster; they have often the remains of color on the surface, and are carved with figures of angels fighting, as if in conflict for the possession of the soul of the departed whose body lies sculptured on the urn. Etruscan inscriptions are sometimes on these vessels, and bronze mirrors are found with them in the form of plates of the metal with long handles. Female ornaments of gold, for the hair especially, are found with them not infrequently.

Pliny mentions Arretium as a town noted for fine pottery. Dr. Fabroni wrote a description of the ancient fictile ware of this locality. He found some remains of a kiln and parts of vessels in the old moulds as placed by the potters ready for baking. Pliny states that the bowls of clay brought from Samos, a Greek island, were famous in all countries. Samian bowls are still famous; in allusion to them and the wine of Samos, Byron says,

"Fill high the bowl with Samian wine."

These vessels are of a fine red colour, and have marked similarity of texture. The circumstance of their being found in England, France, and Germany of the same kind has occasioned a difference of opinion as to how the potters could have procured the same sort of earth in so many localities. The names of the potters are often on the vessels, an inscription signifying that they were turned out from their manufactory. Many of the names are Roman, but some are Gothic or German. The patterns, which are often elaborate on this kind of ware, seem to have been produced by a

wooden, bronze, or other stamp, carved in relief. This stamp was impressed in the inside of a bowl which had been formed and rendered smooth by a turning-lathe, of which there is evidence that early use was made by the Romans; indeed the potter's wheel was of far more ancient date. Having skilfully imprinted the interior of the bowl with the required pattern, it was baked hard, when it formed a mould for the reception of the bowl, which was smoothed by rotation on the wheel. The mould and bowl being then placed in the oven, the bowl contracted by the heat, and when sufficiently hardened was easily removed from the mould. The Samian ware is thick in substance, and strong enough to bear much use for common domestic purposes. There are pateræ and cups of this kind, but the latter are less frequently met with. The small cups are usually without handles, supposed to have been used as salt-cellars or to hold vinegar.

A kind of pottery called Castor, after a place in Northamptonshire where Mr. Artis found some curious old kilns, is supposed to be Roman. These are mostly in the form of drinking cups, ornamented with animals or hunting subjects. This kind of work is effected by drawing an implement shaped with a groove in its centre, into which soft clay is inserted over the vessel in the form desired to be traced. This kind of work must have been done without intermission until completed, and cannot be effected by repeated strokes; it therefore must have required special skill in manipulation. The lines so drawn are usually of a different colour from the ground. The whole was afterwards covered with black or brown glaze.

Vessels of many descriptions and all sizes are found of Roman work, some which would contain a dozen gallons, and are after used to hold the ashes of a burnt body. There are vessels of thick, strong clay, which were used for cooking and all kinds of rough domestic purposes. The mortarium is a dish of a broad shallow shape, which has little sharp stones in the bottom to act as a kind of strainer for vegetables, or salad perhaps specially. These have spouts to let any extraneous liquid run off easily, and a broad rim. They have been found in London, and in many places where Roman remains of buildings exist. Lamps are also frequently found of earthenware with a handle on one side and a spout opposite, also a hole for the oil and to admit air. Sometimes they have more than one burner. They were made either to be carried about or to stand on a bracket of clay or bronze.

Roman tiles are familiar in name at least to most persons. They were of many kinds, such as were used for the roof of buildings, for floors, for drains, or for chimneys, and are almost as good now as when first made. They have been extremely well fired. Some were used for binding over arches of windows or doors, and were used sometimes alternately with stones and layers of mortar, thus forming a strong and compact mass.

The tiles used for the stone or hypocaust were about eight inches square; those used more generally in building were larger, and there was a kind with hollow passages within, which were laid so as to allow the hot air from the stove to pass through them and warm the building either the rooms near or those more distant apartments which it was desired to heat.

The tiles for roofs were made so as to overlap each other, being turned up at one end. Drain tiles were made in the form of tubes, like those of the present day.

Sometimes figures of household gods were made by the Romans of clay, though more generally of bronze, and the most famous deities,

such as Hercules or Venus, were common. M. Tudot has written an account of certain statuettes found at Moulins, in the Valley of the Allier. An ancient manufactory existed here, and the remains of many kilns were discovered and many moulds of different patterns. Heathen idols, busts, medallions, curious figures, birds, beasts, dolls, the figure of a packhorse loaded, &c. This manufactory must have been very extensive und comprehended articles in white clay and other kinds. M. Tudot thought that the Samian pottery was made at this place, and he found the names of no less than 270 potters inscribed on various articles, and it is remarkable that many of these names correspond with those found on pottery which has been discovered in England.

After the departure of the Romans from Great Britain, the pottery which was made is usually known as that of the Saxon period, and of this time it is called in Germany and France, Frankish or Merovingian. The Saxons did not burn their dead, but usually buried them as they died with some of the articles they mostly used or valued when alive. The Frankish warrior was buried with his weapons, his knife, his dagger, his sword, and spear. At his feet were placed a bowl or ornamented urn, and a drinking glass or cup. These urns were ornamented with various devices of rosettes, or carved, or pointed lines waved in various forms. Very often coloured glass beads are found with these various objects. The wooden handles of the weapons are usually gone through decay and the lapse of time, but the rusty sword-blade and spear remain, and the pottery is less changed perhaps than any part of the burial accompaniments. C. O. G. N.

PREHISTORIC PERU AND ITS ANTIQUITIES.

(With a Colored Plate.)

Francisco Pizarro, the European, destroyed the native civilization of Peru, the legacy apparently of still earlier culture. The researches of Captain Robson in the grave mounds of Eastern Peru, which he has kindly allowed this magazine for the first time to publish, have given us a vivid insight into ancient Peruvian life.

Along the Coast in the neighbourhood of Arica there are numerous graves which afford to the explorer singularly well preserved relics. The climate is dry, comparable to that of Egypt, and the soil is saturated with nitrate of soda. This combination gives the tender fabrics of man a greater chance of remaining in somewhat of their pristine condition than those found in the ancient graves of any other country. The ancient Peruvians appear to have taken great pains to preserve their dead. The mummy of the child, fig. 1, is an instance. The bones have been mostly extracted, so as to leave little but dried skin; a little fine hair is left. It is apparently the remains of a child about four years old. When first discovered its face was painted blue and yellow. By its side lay the following objects, which possibly had been associated with it during life, and which were buried with it in accordance with the Indian belief that the utensils of life are usable in the land of spirits. There was a little jacket of

vicuna cloth of very fine manufacture, and decorated with singularly tasteful ornamentation, which may be said at once, as are almost almost all the other objects, to have a Mongolic character. The texture of the jacket resembles that of poplin ; a portion of it is represented in fig. 24. Small slits are found in different parts of the robe, which give elasticity to it, as well as act as ventilators. The child was presumably one of rank, from the fact of a red terra-cotta seal of very rude workmanship being found with its remains (figs. 32-33.) This seal has a very curious hollow stem, by which it is believed to have been attached to a document long since passed away. It is inscribed with a curious frog-like monster, above which are three vandyke points. A diabolical meaning may have been expressed ; perhaps an assignment of property to some dark spirit of the earth. The seal is 3½ inches in diameter. Beside it lay a punch-like figure supposed to represent a deity, also in red terra-cotta four inches high. That this was a form valued by these ancient people is evident from the fact of Captain Robson discovering in another grave a golden image of the same form and size, weighing fourteen ounces (fig. 31), which was found together with the golden cup rudely modelled after the human face and head (fig. 42.) It weighed twenty ounces, and was 4½ inches high. The gold being assayed, was found to be nearly pure.

The ancient Peruvians manufactured pottery of extraordinary forms. Captain Robson told me he made a very large collection of fantastically formed jugs and bottles ; those figured in the plate are not of such extreme grotesqueness, and are from a quarter to one sixth of the actual size.

The bowl (fig. 48), is ornamented by demi-masks in rudely painted outlines, and is the cup for containing the maté tea of which these vases or jugs formed the teapots.

A great number of specimens of Peruvian pottery are more or less modelled in distortion of the human body. Fig. 35, is an imperfect vase, the head of which shews a human resemblance ; it had two handles, and is marked with circles and small dots, probably in representation of the solar system, with a central sun, and surrounding planets. Fig. 38 is a plated vase of a shape sometimes found in Celtic pottery ; its texture is rough, calculated to stand the fire in cooking. Figs. 40 and 49 are of a uniform black, unglazed ware, reminding us, so strongly of the so-called black Etruscan ware, as to suggest a common origin. The teachers of the Etruscans were evidently Phœnicians, as were probably the teachers of the Peruvians, although we cannot at present say when they arrived from the East. These two-handled vases were evidently designed to be carried by means of a strap or cord, after the manner of a "pilgrim's bottle." Fig. 40 is ornamented with two ears of maize. Maize was the cereal on which they mostly relied ; the heads of corn were very large in ancient Peru, and probably formed the great staff of life of the people. As a testimony that maize was the necessary of the Peruvian's life, I have given a figure of a net, containing five ears of this corn found in the same prehistoric grave-mounds. Fig. 9, another pilgrim's bottle, is inscribed with the letter X in black. This cross-like mark may be a relic of the Phœnician or Hebrew *Tare* associated with the worship of Tammuz or Venus ; the deity especially connected with the passion of love. Fig. 36 is a distorted vase of dark stone-coloured ware, inscribed with a rough caricature of the human face, a cross or X being likewise marked on this specimen. Perhaps the most valuable specimen of the pottery ob-

tained by Captain Robson, is a bottle of red ware painted with white and red marks. Two representations of the letter S are very conspicuous, and also a breast-plate-like mark. The Peruvians received their arts from a Phœnician source, and the letter S, signifying snake, was a favourite emblem with the Phœnicians, indicative of serpent worship. The human figure-like vase and breast-plate seem to preserve a vestige ot a priesthood, in externals at least Jewish. Figs. 47 and 51 are caricature distortions of human form. Fig. 48 is a bowl of coarse earthenware with a very rude representation of the eyes, nose and mouth. Fig. 44 is a crucible which has seemingly been in use from the fact of its being much smoked. The Peruvians were metallurgists, well acquainted with the art of smelting as well as gilding and coating foreign substance with galena or pyrites. Perhaps the most important relics discovered by Robson were the textile fabrics and the implements with which they were made. Fig. 5 is a turban, made of cord of two colours, and ornamented by two tassels, made of the leaf of the agave. Fig. 6 is part of a very thickly fringed garment of two strongly contrasting colours, the material being vicuna. Fig. 7 is a piece of reddish vicuna cloth, ornamented by figures of toucans. Fig. 8 is a piece of vicuna ribbon, somewhat coarse in texture. Fig. 15 is a ribbon of a very beautiful pattern. Fig. 21 is a fringed ribbon of much simpler design. Fig. 14 is a scrip for wearing round the waist; it draws in with a cord at the top like the old-fashioned English bag. It is made of a vegetable fibre, probably cotton, and is of a striped pattern. Fig. 19 is a scrip, ornamented with hieroglyphics. Many of the Peruvian patterns appear to be specimens of picture writing. Fig. 23 is one of the best specimens of the vicuna cloth Captain Robson was able to obtain, apparently a scarf having a well formed fringe. Fig. 18 is a red uicuna cloth ornamented with figures of a coati, and is in the form of a knee cap. Fig. 13 is a head net for confining the hair. Figs. 22 and 27 are standards, ornamented by figures of a very extraordinary character, clearly hieroglyphics. They were painted upon pieces of cloth on a bamboo foundation. Fig. 25 is a standard of another character; it is a loosely woven fabric of wool, apparently knitted with knitting needles, of which several were found with it; but we have not space to figure them. Fig. 17 is a standard of a more simple pattern, and woven in the cloth. Fig 46 is a bobbin used for netting. Fig. 16 is a knitting case made of fibrous materials somewhat resembling plaited cocoa-nut husk. It contained peculiar wool of several colours, thus proving the antiquity of the art of knitting. The art of shawl making was well understood by these ancient people, as it is evident by fig. 29, which is apparently part of a a scarf resembling one of of the ruder European fabrics of Paisley or France. Fig. 54 consists of three pieces of bamboo, wound round with thread of different colours so as to form a pretty pattern; this is conjectured to have been used in weaving together with fig. 55, in which the thread is wound in a different manner. Figs. 56, 57, and 58 are ornamented spindles, while figs. 52 and 53 are shuttles. These are from one-half to one-third of the actual size. Fig. 11 is a head dress formed of plaited fibre, and decorated with a scarf of poplin-like vicuna, having two tassels. Below it is decorated with feathers of the macaw, which preserve some of their brilliant colouring. This was evidently full-dress head gear. A much plainer head-dress is fig 12. Fig. 37 represents a hair comb, formed of wood resembling whale-

bone, spliced together between two sticks with vegetable fibre thread. Fig. 4 represents a human mummy packed compactly in a cotton cloth, in pattern resembling modern bed-tick, and confined together by an interlacing cord net, apparently of aloe fibre. By its side lay a paddle (fig. 30), round which was twisted a cord. The paddle, which is about three feet long, is ornamented on both sides near the centre with a human face. Near also lay a piece of patch-work composed of six different cotton cloths sewed together, forming part of a garment of many colors, which may have belonged to the deceased: fig. 28 is a small portion of it. A rough scooped out stone (fig, 34), formed the mortar in which his corn was crushed. His dinner, ready to be carried to the scene of his labours, is contained in the basket (fig. 2), a quarter of the actual size; it is covered with a calibash, and tied with a ribbon; it contains maize and other seeds buried with him as his food in the land of spirits. The remains of a macaw (fig. 3), were found near this spot, carefully wrapped in cloth, presumably a favourite bird killed and buried with him for his enjoyment in the spiritual world:—

"Where are now the youths who bred
him,
To pronounce their mother tongue;
Where the gentle maids who fed him
And who built his nest when young?
All, alas! are lifeless lying,
Stretched upon their grassy bed."

In a casket of split bamboo (fig. 10), having a lid which opens with a hinge, some of the fine vicuna cloths we have figured were found; as also a necklace (fig. 20), made of portions of shells drilled and strung in the Polynesian manner. Fig. 26 is a portion of a necklace composed of flat pieces of mother of pearl. These relics of a departed nation are especially interesting, as of antiquity equal probably to the earlier Egyptian mummy pits, while the preservation of the cloths as to colour and their fine textile execution renders them more interesting than any similar relics of ancient man, and are calculated to teach the moderns many lessons in the history of art, by enabling them to compare the past and the present.

Captain Robson brought home many other specimens from these graves, which space prevents us from figuring. He obtained typical skulls of the pre-Inca race, which was important as identifying these arts ethnographically. Consul Thomas Hutchinson, an excavator in these grave mounds, considers these Peruvian graves the oldest in South America, but he says that reliable information has not yet been gained as to the arts and knowdlege of these early Peruvians. "According to Polo de Ondegardo A.D. 1550, and the Inca Garcillaso de la Vega, A.D. 1609, down to Mariano Felipe Paz Soldan in 1868, seven centuries ago, the first Inca Mauco Capac and the woman, Mama Pellee, were created by the Sun, nursed in Lake Titicaca, the cradle of the Incas, and founded a new dynasty in Peru." (Jour. Anthro. Inst., vol. IV., page 438). The largest vase obtained by Captain Robson is of the capacity of about three quarts, and shews a considerable likeness to the one which Dr. Schleimann excavated at the site of ancient Troy; a conclusive proof of intercourse between the East and West at this early period.

FALLACIES OF FREE TRADERS AND BANKERS.

THE late Mr. Richard Cobden, in the latter years of his life, gained an increase of reputation or notoriety by the negotiation with the Imperial Government of France in 1860, by which the goods of each country were to be admitted at reduced duties. There was considerable opposition to the Treaty, especially in France, where the manufacturers feared competition from the superior cheapness of certain English goods, particularly cottons, woollens, metal-work, stoneware, and chemicals. The English manufacturers of silk, fancy articles, and drapery goods feared the competition with French goods admitted duty free, hence the opposition the Government Bill, based on the negotiations of Cobden, met with in the House of Commons. The propositions of Mr. Cobden to France were sufficiently liberal; in truth England appeared to give everything and receive next to nothing. Large sources of revenue were to be entrenched on merely to give a small increased chance of the introduction of English goods into France. *Punch*, a facile commentator of current topics, said,

"You're robbing Peter to pay Paul.
You tax the Briton to save the Gaul."

Satirists are often the first to expose the hollowness of party measures.

But Napoleon III. was determined to carry out at least a modicum of the suggestions of Cobden and the British Government was quite willing that Peter should be robbed if there was even a chance of Paul being thereby appeased, who had but recently threatened him with an unprovoked invasion. There was a general 10 per cent. *ad valorem* duty on French manufactured goods brought into this country previous to the Cobden Treaty, and this contribution to our revenue was sacrificed. Besides the amount that it contributed in hard cash to the Imperial Exchequer, it may be said to have operated as a protection of at least 20 per cent. to the manufacturers of England, so when this was taken away the industries of Norwich, Coventry, and Spitalfields, in silk, and the watchmakers of Coventry, and many other industries, began to suffer. In the year 1862-1863 especially, the distress in Coventry was alarming, and considerable efforts were made by benevolent persons, including Lord Leigh, to alleviate the distress. This was one instance out of many where positive calamity, without any corresponding benefit, was produced by Cobden's Treaty. It is worth while to compare England and France with a view of noticing the characteristics of each and their people. A great diversity of tribes, no doubt, mostly derived from one original source, people the British Islands. The hardy Highlander of Scotland, narrow and exclusive in his prejudices, single-minded in his pursuits, and self-denying in his habits, is a great contrast to the mechanically industrious Lowlander, a Radical reformer, loving sectarian detail, valuing educational advantages; associating with his neighbours in systematic profitable work; saving the fruits of his industry, and earning for Scotland the reputation of producing men not second to any on the globe. This Scottish element has for many years greatly pervaded the British Empire, and has given to it a solidity, and to its governing classes a sagacity which the men of the south and east portions of the empire do not so readily furnish. The Norse populations of Lancashire, Northumberland, Durham, Norfolk, and South Devon have given the wide-spreading enterprise, which founded the British

Colonial system; and leaving at home to "tarry by the stuff," as it were, the more mechanical, indefatigably industrious people of Central England—Yorkshire, Bristol, Glasgow, and London—raised to the highest pitch the wealth and commercial prosperity of England, which at the time of Cobden's treaty gave to our empire an Imperial supremacy in trade. But this Imperialism, although acknowledged to be a reality, had a tendency to produce a vain confidence, and, as a consequence, the neglect of those principles by which alone Imperialism was gained, and by which alone it could be maintained. The bulk of the inhabitants of Great Britain, live in a Paradise, in comparison with the livelihood of most nations, and to those who wisely live in this Paradise it may truly be said to be an Eden. But to those who live in it for the indulgence of their appetites, their passions, and their caprices, it is truly a *Fool's Paradise.* The wise among the nation—those who know good and evil—are few. For some generations a few wise men governed Great Britain, and it is to them that we are indebted for the national greatness that we all admire. After the passing of the Reform Bill, a much larger element made its influence felt in the council of the nation, and its representative men were led to think more and more that their position and influence depended rather on their popularity with the masses of the people than on their wisdom and integrity. The growth of this sentiment was like that of a tree—gradual. Year by year it might grow larger or taller, but its growth was imperceptible. Still, on looking round, an accurate observer could perceive that the graft of popularity was growing, and gradually usurping the place which had formerly belonged to the branches of wisdom and integrity. And now, in bidding against each other for power in the State, the Whigs and the Tories, the Liberals or the Conservatives, offered not what they themselves deemed best, each in accordance with his own professed principles, for the country; but what the party leaders of each thought of most value as a bribe to the electors. If such has been their policy—if they are content to barter the plausible for the real, and are willing to sanction adulteration—they must expect to find themselves standing in an adulterated country on a rotten foundation in the LAND OF SHAM, and may find that their national prestige will follow strictly the internal national decline. Truth and honour and poverty are better than dishonourable wealth, and the world always finds at last the hollowness of forgery and imposture.

A country can only be wisely governed by its representative men, and are bound, since these are few, to get them on honourable terms. Politicians who offer electors bribes, whether in the shape of direct contributions to their individual pockets, or as the hirelings of class interests, are unworthy of confidence. A reputation for wisdom, knowledge, and integrity, without any pledge as to policy or affiliation to any party, is alone satisfactory in a representative man; the contrary being the rule in the representatives in our Parliament is a conclusive proof of the decadence of the British Constitution.

Englishmen are not a saving people. Industrious beyond other nations, it is to the few that they delegate the accumulation of property, preferring to consume on the Saturday half-holiday what they do not require for their sustenance during the rest of the week. If this is the rule of those at the basis of British society, it is not departed from by the middle and upper classes, who are usually said to live up to their incomes. The foolish extravagance of the majority gives the

acquisitive minority an opportunity of acquiring immense wealth. At the corner of each street they plant gin-palaces, where profitable trade is carried on at the expense of the bodies and souls of the million. Drapers, tailors, and other tradesmen attract custom and collect money, and the numerous classes which supply the publicans and the traders with material, and the higher professional middle-class which assist in the business, or contribute to the gratification of society, each aims to enrich himself at the expense of the community; and the community, by its extravagant expenditure, gives to each of these grasping classes his wish—wealth. It seems most difficult to teach lessons of prudence by any other means than that of misfortune; and the majority of the unfortunate, as regards prudential reform, are incorrigible, (for their misfortunes are mostly to be traced to organic deficiency in prudential sentiments); therefore as a necessary evil the grasping selfish man must be looked to as the trustee of a nation's capital. He will not on behalf of the national interests, nor for the love of his fellow-men, but for his own self-interest, pursue a course wiser than that of the spendthrift. These selfish men are the great founders and pioneers of commercial industry and national prosperity, for they, in pursuit of their own selfish ends, find labour for the unemployed and market for the hitherto unmarketable. While those outside this charmed commercial circle should never forget the selfish mainsprings which give motion to the circle, still they may more safely adopt as leaders those within it, than those who having nothing, expect, by schemes, to get everything.

In France a similar mixture of Teutonic and Celtic elements pervade the ethnology; but the Celtic element being stronger, and the climate more genial, the Norse enterprise has less scope, and seems less required. Of the countries of Europe, France is the finest, and its population well nigh keep pace with the country. They have their defects: industry, intellectual activity, and vain glory, alternately predominate, and by the preponderance of each at the time, is the character of the nation declared. Lower wages will satisfy a Frenchman, for this smaller sum will provide for his wants as well as a means of provision for his old age. Hence the French as a whole are a saving people, eight or ten times as many persons as in England are holders of the national funds, and consequently the French *Rentes* have a stability in the national mind, equal to those of more stable because more Teutonic countries. The Frenchman on the whole is an honest man. He relies on his honour, and it may be in general relied on. The combinations in trade in France are smaller, there being less confidence and more ignorance of national wants, so gigantic commercial successes and gigantic commercial failures are less common than in England. On the whole, certainly since the year 1860, a sounder trade has been done in France than in England, which appears to have got great benefit from the commercial treaty of Cobden. Trade and capital, like the tide which runs into a basin, recede as easily as it flows in, unless floodgates capture and retain the water and the capital at the period that it is at the highest. This the French politicians appear to understand, and by sliding scales adapted to the price of wheat, and by a well-organised system of bounties on the export of refined sugar, the national wealth, based on its most secure basis, that of the prosperity of its agriculture, is secure so that even a year of calamitous war and an indemnity to pay, far greater than that imposed on any other country, has made France after seven years of peace the most wealthy country in the world. Will the ad-

vocates of Free-trade, falsely so-called, now compare the condition of England at present with that of France. The silk manufacture has almost departed from Great Britain, the sugar refining industry is expiring, having ceased to be profitable, the iron trade once the very backbone of English prosperity now cannot be carried on except at a loss. The cotton industries most numerous, the very heart of British commercial success, is now a losing concern. The various hardware industries barely pay their expenses. Our national capital is fast melting away, because foolhardy politicians have not known when to close the floodgates; the tide of prosperity has turned, and it has turned against Great Britain. Traders and manufacturers are willing to carry on their business even when such can be done only at a loss. More anxiety is shown to do a large business, even though unprofitable, than to do a small and lucrative trade: it is the reverse in France. Therefore when the whole world competes with Great Britain, all her systems of commerce are on the stretch, and the strain at every point becomes too great for even her gigantic commercial strength to bear. The iron feet are broken, also the dependant industry of potter's clay. The belly and thighs of brass feel the shock, the breast and arms of silver feel a depreciation, and lastly the head of gold itself, the capital, begins to melt away. Such an image once appeared to Nebuchadnezzar, king of Babylon, and the analogy is wonderfully exact to the concomitants and impending fall of a modern Babylon, a mart of nations on the banks of a great river. The British constitution was so powerful, the resources of our country and her people were so great, that had the principles of integrity and prudence that built up the empire only been maintained, Britannia might have defied her enemies by sea and land, as well as her rivals in trade. But a system of barter gradually pervaded and usurped the place of legitimate trade. It was principle; it was honour; that was offered in exchange for popularity; useful sources of revenue were sacrificed to vain-glorious parade; professedly to benefit the many, they were cunningly contrived to enrich only a few. The removal of the paper duty sacrificed five millions of revenue to the benefit of a narrow minority. The retail price of paper was not sufficiently reduced to benefit the masses of the population, while the stimulus it gave to foreign competition considerably damaged a great industry in Great Britain The wholesale price of paper did fall, and facilitated the establishment of cheap journals, which flooded the field of literature with such swarms of the more volatile contributions to amusement as to obscure the path which should have been kept clear for the solid contributions to knowledge. If knowledge was more easily diffused by cheap paper, it was by that means diluted and adulterated and deprived of its strength and its value. The popularity which the advocacy of the Press had vamped up for the cheapness of foolscap, was now destined to be increased for the cheapeners by the same means of tea, coffee, sugar, and the numerous luxuries which had formerly paid toll to the revenue year by year, a public taste was stimulated for an annual sacrifice of revenue. The Press, the hireling of the party, strove to make the nation think that its prosperity was best secured by the sacrifice of revenue, and consequently by the neglect of those costly precautions which the safety of the empire require; hence, when the advent of danger makes itself known there is a panic, similar to that occasioned when the thundering blows of the fireman announce that the premises are in flames. Precaution, even if it be costly, is far

less expensive than unpreparedness against frequent recurring contingency. And now to the state of things in 1879. The French war indemnity put large capital in the hands of Germans who, in haste to increase it, forgot the laws of prudence; and indulging in the costly luxuries for which they had acquired a taste through their conquest of France, soon brought back the money to a people who, profiting by the severe lessons which the calamities of war had taught them, now resolved to take care of their money. God grant that the period of commercial distress and unprofitable industry through which England is now passing, may teach her the hollowness of bartering her solid sources of revenue for unequal equivalents in foreign countries; teach her people that to her own soil they should look for their food, and to their own industry, and that of their own colonies, for the production of luxuries. That the development of British trade should primarily be sought in British possessions, and that the individual should more seek by the economical and wise expenditure of small means to attain present comfort and future independence, than by the straining inflation that requires large means for its development, and is even, when attained, as unstable as a wind-bag, that a prick of a pin may reduce to the flattest capacity. Careful calculations, founded upon the experience of those who have risen from the humblest position to great wealth, have convinced the author how comfortably a man may fare on sixpence a-day, and how he may support a family on threepence a-head: this involves a recognition that fruits and farinacea are the proper food of man. If our lower classes recognised this principle, contentment would render strikes impossible, and economic savings; would substitute for them co-operation, so that the poor man might if possible compete with the rich by substituting co-operative for the ordinary industrial system. Let this plan be generally adopted, and English prosperity will shed its light over the now gloomy horizon; no more will Joint Stock Banks fail from having supported rotten industries, but a home-fed population, nourishing its own soil out of its own exuviæ, will invest their savings in the surest if not the most high paying investment, the production of national food. Foreign loans that soon fail to pay principal or interest are alone floated by free traders, falsely so-called, who would not be tempted to throw away their hard-earned savings if commercial treaties were equitable.

THE IRISH AFGHAN IN CYPRUS AND AFGHANISTAN.

The following is somewhat condensed from two letters of "the Afghan in Ireland" to his brother in London:—

CYPRUS, *August 28th.*

I leave for India to-morrow; but before I go I must let you know how I have got on here. I could neither "beg, borrow, nor steal" money for my passage to Alexandria, therefore I had to work it. It was a steamer bringing coals from South Wales to Alexandria that conveyed me. B—— told me how to get to South Wales, which I did for 4s. 6d. as a deck passenger from Cork. When I got to Swansea I had to wait a week before the vessel was ready. The captain did not like my looks at first; he thought I was a runaway clerk, but he said if I would agree to work a week at unloading the coals at Alexandria, he would take me for nothing. "Very well," says I, and I stepped on board. The sailors' sleeping place was an abominable black hole, awfully stuffy; I thought I would never

sleep in it. I wished myself back in Cork on my 12s. a week. We got under weigh, and it was rough that night in the Bristol Channel; I thought I would have burst with sickness for three days. No salary at Cork without this sickness was better than wealth and sea-sickness. I felt fit for nothing. The sailors knocked me about, and I was too ill to make any resistance; this was at once insulting and unkind. I could eat little for the first week. They made me do the roughest scrubbing in the ship, shovelling the coals, and doing the work of under fireman. This was slavery indeed, worse than that under the British crown. The food was bad, and the water worse. If it had been a long voyage, I would have organized a mutiny; but when I was thinking about it we got to Alexandria. I worked my seven days at unloading the coals, and the captain gave me 10s. It took me a whole day to get myself clean and tidy. I took a first-class passage in the steamer from Alexandria to Cyprus, for I found it requisite to arrive there as a gentleman. There was a person of title on board. I was very civil to him, and three days after we landed, he took me to call on the Governor, who frankly told me it was no use to look to him for a situation. What was to be done? My money was all expended in that first-class passage, and Cyprus has become an expensive place. I had to sell my "Remington" and ammunition for just what I gave. I at first thought I would grub up antiquities, and for three nights I dug, for it is a thing forbidden, and not safe day work. I found, however, that for which I got £10, principally pottery. For the first time I was in pocket so large a sum since I bought my rifle. However, I got warning that I would be arrested if I did the thing again, and thought it more prudent to leave the Island, so I got only this £10 out of Cyprus. An officer took a fancy to me, and said he'd give me £60 a year and board and lodging to come and be his secretary and servant; but I found that he had been in a regiment which I had been in, and left without leave, so I did not deem it prudent to come to him; so back to Alexandria I went.

[Second Letter.]

Before I had been there a week, I was engaged by an English officer bound for the Afghan frontier. I was to get two suits of clothes a year, £70, board and lodging, and a native servant to attend on me; I was in fact to be treated like a gentleman, although not like one in his honor's own rank. It was fast steaming that brought us to Bombay through that abominable Red Sea. To the front we got at last. I like the country very well. I had not been at Peshawur a week before I met with a Lieutenant-Colonel who had been in my old regiment. He looked at me as if he knew me; this gave me a shiver. I was obliged to deny all knowledge of him or his brother officers. Hearing the talk of the men, and not seeing any Afghans, who were disposed to engage my services, I began to take a real interest in the war; and if I could have got a captain's commission I have no doubt I would have been a good officer; but we do not get justice in this wicked world, so I had to make myself content with the possible hopes of plunder if we got to Afghanistan. Away we went on to Ali Musjid. I had to walk and carry a heavy rifle for my master's protection. The fort was deserted. I went into it early, and found about a dozen dead bodies; some wore gold ornaments. Thinking they were no use to them in their present state, and might be decidedly to me, I put some of them into my pocket. There's not an ounce of gold in the whole of them; however they are worth more as curiosities. I am told the officers would give me £10 for them, so later on I will sell them. I incurred great risk in picking up these little things, as it is quite forbidden under heavy punishments; but looting is such a pleasant occupation, that I would rather run the risk of being shot than keep my hands in my pockets. Several scarves and a cachemire shawl I managed to tuck in under my clothes, so I got some specimens of their manufactures, as the saying is, "almost given away." I must now close, as the post is going.

Your brother,

T. O.

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