

An account of the regular gradation in man, and in different animals and vegetables ... / by Charles White. Read to the Literary and Philosophical Society of Manchester ... in the year 1795 / by Charles White.

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AN ACCOUNT
OF
THE REGULAR GRADATION
IN MAN,
AND
IN DIFFERENT ANIMALS AND VEGETABLES;
AND
FROM THE FORMER TO THE LATTER.

ILLUSTRATED WITH ENGRAVINGS ADAPTED TO THE SUBJECT.

BY CHARLES WHITE.

READ TO THE LITERARY AND PHILOSOPHICAL SOCIETY OF MANCHESTER,
AT DIFFERENT MEETINGS, IN THE YEAR 1795.

“Ad eum modum summus opifex rerum seriem concatenavit a planta ad hominem, ut
“quasi sine ullo cohæreant intervallo; sic Ζωόφωτα cum plantis bruta conjungunt; sic cum
“homine simia quadrupedes. Itaque in hominis quoque specie invenimus divinos, humanos,
“feros.”

SCALIGER.

L O N D O N:
PRINTED FOR C. DILLY, IN THE POULTRY.
M.DCC.XCIX.

AN ACCOUNT
OF THE
THE HIGHER GRADATION

IN DIFFERENT ANIMALS AND VEGETABLES
AND
FROM THE FORMER TO THE LATTER

ILLUSTRATED WITH ENGRAVINGS ADAPTED TO THE SUBJECT

BY CHARLES WHITE

AND TO THE EDITOR AND PUBLISHER OF THE
AT THE END OF THE VOLUME

ALL THE RIGHTS OF THE AUTHOR ARE RESERVED
BY THE AUTHOR AND HIS HEIRS

LONDON:
PRINTED FOR J. BARNES AND SONS
IN THE STRAND

THIS ACCOUNT
OF
THE GRADATION IN MAN, &c.

IS INSCRIBED TO

SIR RICHARD CLAYTON, BART.

BY

HIS AFFECTIONATE

AND MOST FAITHFUL

HUMBLE SERVANT,

THE AUTHOR.

Manchester, February, 1799.

THIS ACCOUNT

THE GRADATION IN MAN, &c.

IS INSCRIBED TO

SIR RICHARD CLAYTON, BART.

BY

HIS AFFECTIONATE

AND MOST FAITHFUL

HUMBLE SERVANT

THE AUTHOR

ADVERTISEMENT.

THE Author of the following Essay has no desire to elevate the brute creation to the rank of humanity, nor to reduce the human species to a level with brutes; and he hopes that nothing advanced will be construed so as to give the smallest countenance to the pernicious practice of enslaving mankind, which he wishes to see abolished throughout the world. Neither is he desirous of assigning to any one a superiority over another, except that which naturally arises from superior bodily strength, mental powers, and industry, or from the consequences attendant upon living in a state of society. He only wishes to investigate the truth, and to discover what are the established laws of nature respecting his subject; apprehending, that whatever tends to elucidate the natural history of mankind, must be interesting to man. He was insensibly led to the present consideration, from hearing Mr. *John Hunter's* Remarks on the Gradation of Skulls, as he stated in the introduction to a Course of Lectures on Midwifery, which he delivered last winter at the Lying-in Hospital in Manchester.

The

The Author does not profess to have a knowledge of natural history adequate to the extent of his undertaking. Indeed few opportunities have been afforded him for prosecuting studies of this kind, since he has been almost constantly engaged, during the greater part of his life, in the practice of a fatiguing and anxious profession: even the hours which he has employed on this work have been, in a great measure, abstracted from the time usually dedicated to sleep. He desires, therefore, that the present Essay may be considered by the Physiologist, not as a complete Treatise on the subject, but only as a collection of hints and observations for the use of others who have leisure and opportunity to carry on the investigation.

Those who are well acquainted with natural history, will, probably think he has made too many, and too long quotations; but it should be remembered that his work may fall into the hands of persons who may require such assistance, in order the better to comprehend the Author's design: besides, he wishes the reader to be informed of the countenance that has been given to the doctrine of general gradation, by some of the most learned men of the age.

The student must not, however, expect to find an uniform gradation in all the faculties and powers of different subjects: it frequently happens that an inferiority in one particular, is accompanied by a superiority in some other particular; so that the ascent or descent is not always

ways by equal, but often by irregular steps. Some of the less important gradations which the Author has enumerated, may not perhaps stand the test of a strict scrutiny; but, on the other hand, many others may yet be discovered which have not occurred to him. However that may be, he hopes his observations are not improperly announced by the title-page prefixed to them..

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Negro.

Plate 1.st

*European
from Cheselden.*

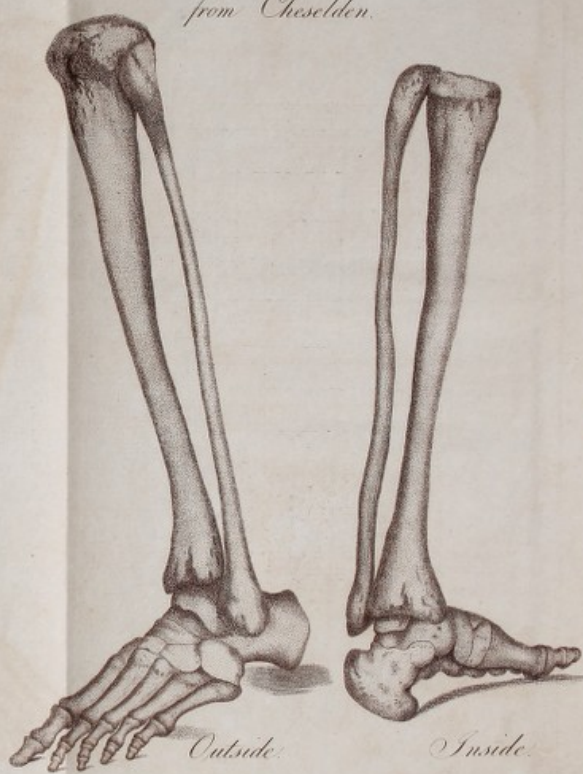
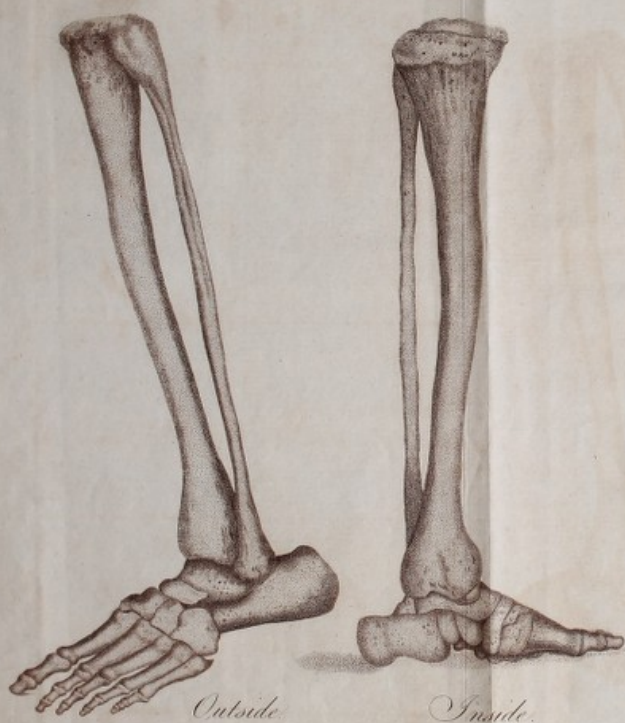
































Plate 2	Negro.	American Savage.	Asiatic.	European.	European.	Roman Painters.	Grecian Antique.
	70°	73½	75°	80°	90°	95°	100°
<i>Gorilla.</i> 65°							
							
							
							
<i>Snipe.</i>	<i>Crocodile.</i>	<i>Greyhound.</i>	<i>Great Southern Hound.</i>	<i>Bull Dog.</i>	<i>Monkey.</i>	<i>Man of the Woods.</i>	<i>Orang Outang.</i>

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Plate 3.

The Orang Outang

of D^r. Tulpia.

The long Arm'd Ape.

D^r. Tyson's Orang Outang



Goldok, or, Wild people.

Female.

Male



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PLATE I.

EXPLANATION.

This Plate contains two drawings, taken from the bones of the leg and foot of a Negro skeleton in my possession, shewing both their inside and outside.

All the feet of Africans, which I have seen, are much flatter than those of Europeans; but what is most remarkable in this representation is, the extraordinary shape of the *os Calcis*. Whether this is generally the case, I will not pretend to say. I have another skeleton in my possession, which I am informed is that of a Negro; but, though flat, it does not possess that peculiar shape.

The other two drawings in this Plate, are copied from Cheselden's *Osteographia*, in order that the reader may compare the same bones in the African and European.—(See page 42.)

PLATE II.

This Plate is intended to shew the facial line in Man, and in different Animals, from the perpendicular line in the European Man, to the horizontal one in the Snipe or Woodcock, and likewise the angle of 95 degrees, to which the Roman painters were very partial, and that of 100 degrees, the model of the Græcian Antiques.—(See page 51.)

In order to obtain the facial line, an horizontal one should be drawn through the lower part of the nose, and the orifice of the ear, having regard to the *os Jugale* or cheek-bone. Upon this, another line should be erected, which should touch the forehead and the upper lip. If this be a perpendicular line, it gives you the best formed European face, forming an angle of 90 degrees. If it forms an angle of 70 degrees, it gives you the face of the Negro, &c.

PLATE III.

This Plate exhibits copies of the best authenticated engravings that have yet been published, of four different kinds of Apes, which approach nearest to Man: likewise

the skull of Dr. Tyson's Pigmy—the skull of a Monkey from Lavater—the profiles of a native of Botany Bay and an European—and the profiles of an African and an European.

PLATE IV.

- a, a, a, a*, Square Portion of the Skin of a Negro.
b, The *Cutis vera*, or True Skin, which is White.
c, The darkest *Rete Mucosum*, which is the under Layer.
d, The Bluish or Greyish *Rete Mucosum*, which is the upper Layer.
e, The Cuticle itself, a Mixture of Blue and White, or Greyish.

See Pages 101 and 102.

See also the Plate in Cruikshank's Experiments on the Insensible Perspiration of the Human Body. Fig. 4.

ERRATA.

PAGE vii, advertisement, l. ult. after Manchester add viz, in 1794.

11. l. 15, for Marginefe read Manchineel.

19, l. 5, for alive read adive.

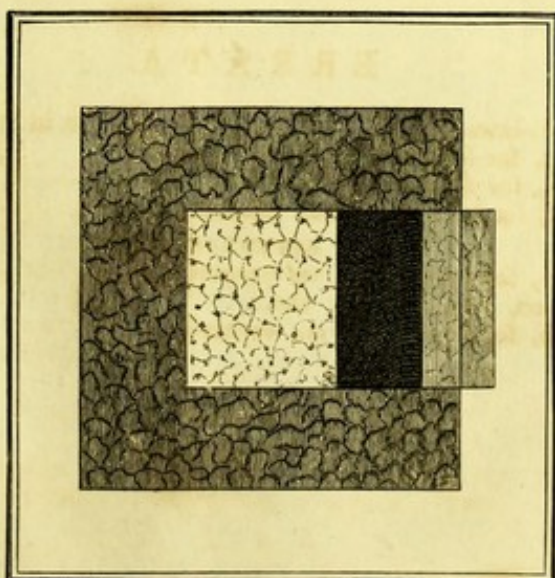
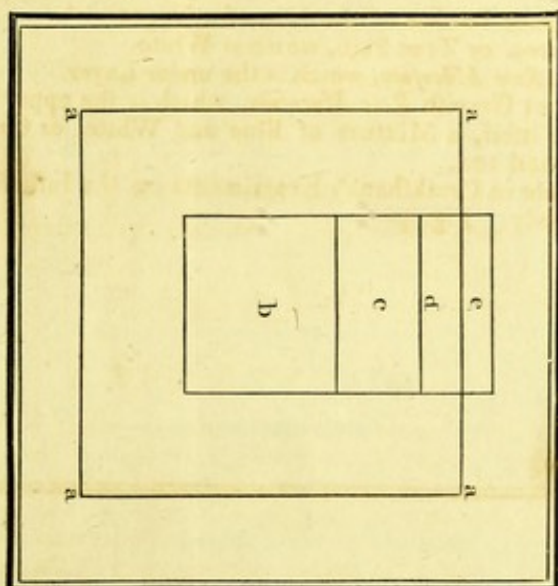
ib. l. 6, for Masomalis read Mesomelas.

APPENDIX.

cliii. l. 11, for proportion read proportions.

clxvii. l. 20, after that read the.

lxiv. l. 10, for vegetation read vegetative.



ACCOUNT
OF THE
REGULAR GRADATION IN MAN,

&c. &c.

PART FIRST.

ON GRADATION IN GENERAL.

EVERY one who has made Natural History an object of study, must have been led occasionally to contemplate the beautiful gradation that subsists amongst created beings, from the highest to the lowest. From man down to the smallest reptile, whose existence can be discovered only by the microscope, Nature exhibits to our view an immense chain of beings, endued with various degrees of intelligence and active powers, suited to their stations in the general system.

In the animal kingdom, the different classes into which Nature seems to have divided her productions, are so blended by creatures apparently anomalous to all system, that it is often difficult, and sometimes impossible, to draw lines of

distinction. The inhabitants of the earth and air encroach upon each other ; for there are flying *maccaucoes*, flying *mice*, flying *squirrels*, and *bats*, which, though quadrupeds, have wings to buoy themselves up in the air ; and, on the other hand, there are some birds that cannot fly at all, as the *ostrich*, the *touyou*, the *cassowary* and the *dodo* : — the porcupine, though a quadruped, has quills. Nor are even the inhabitants of the sea and those of the air much better discriminated ; for we meet with flying fish, and birds that inhabit the waters. Amphibious animals link the terrestrial and aquatic ; we find some fish with and others without lungs. The distinction of animals into viviparous and oviparous is not more definite ; for vipers and cartilaginous animals produce their eggs within their own bodies, previous to the exclusion of the live animal ; and some animals are, like vegetables, propagated by germs, neither viviparous nor oviparous. Bipedes, quadrupeds and quadrumanuses equally encroach on each other ; there are some apes that walk only on their hind-legs, and others that walk on all four ; and the greatest part of them use their hind-feet in the manner of hands. The genus *Lacerta*, from the alligator of twenty feet to the lizard of three inches, forms a class of animals connecting the race of quadrupeds with that of reptiles.

Several eminent Naturalists have endeavoured, in vain, to define the boundaries of the animal and vegetable kingdoms. Mr. *John Hunter* maintained, that all animals

have stomachs, and that vegetables have not; that all zoophytes are animals, though they have no loco-motion, nor even any motion at all, but are fixed to a rock, where he supposed them to be nourished by the sea throwing food into a cavity which he called a stomach. This has however been denied by others. Mr. *Smellie* says, "The polypus has no stomach, or rather, like vegetables, its whole body may be considered as a stomach. Its natural cavity contains no viscera; and when this animal is turned outside-in, it still continues to live and to digest its food, in the same manner as if it had received no injury. The mode by which plants are nourished is extremely analogous; they imbibe by the roots, the trunk, the branches, the leaves, and the flowers. Instead therefore of having no stomach, their whole structure is stomach. In regard to the brain, the polypus and many other insects are deprived of that organ. Hence neither stomach nor brain are essential characters which distinguish the animal from the vegetable." *

Buffon says, the fresh-water polypus may be regarded as the last of animals and the first of plants.

No distinction of plants and animals can be derived from the sexual œconomy. The generality of plants indeed are hermaphrodite; that is, they have the male and female organs of generation within the same impalement;

* For these and other similar discoveries and observations, Naturalists are much indebted to *Trembly*, *Bonnet*, and *Spallanzani*.

but several animals, as shell-fish, and others deprived of the power of moving in search of mates, have likewise both sexes in one individual. The female fish, in some instances, lay their eggs upon the shore, which are afterwards impregnated by the male, without his ever seeing the female. Something analogous to this is observable in some plants.

The system which attributes sensation to animals and denies it to vegetables, is very illusory:—many vegetables, acknowledged to be such, are much more irritable than some animals. There are some sensitive plants so extremely irritable, that if they are touched by any substance, the whole plant, both leaves and branches, falls to the ground. The *dionæa muscipula* *, or Venus's fly-trap, is a plant whose leaves are so irritable, that when any fly alights upon them, they close upon it and squeeze it to death †. The *hedyсарum gyrans*, or moving plant, possesses and exerts the power of moving its leaves in various directions, as an animal does its members ‡.

No criterion of distinction betwixt plants and animals can be obtained from their situation or manner of living. Plants as well as animals are found on land and in water.

* Ellis on the *Dionæa Muscipula*.

† See the Annual Register for 1775, page 93.

‡ See Encyclopædia Britannica, Art. *Hedyсарum*.

Worms, &c. live under ground; and truffles (*lycoperdon tuber*) vegetate and are perfected without appearing above ground. There are parasitical plants, or such as vegetate upon and receive their nutriment from other plants, as the mistletoe, &c. and there are animals whose natural and destined habitation seems to be the bodies of other animals. Some animals draw their nourishment from plants, and some plants are propagated upon animals, as horns, beaks, hair, nails, &c. which can be considered in no other light than that of vegetables.

Dr. *Bell*, in his inaugural thesis "*De Physiologia Plantarum*," published at Edinburgh, 1777 (a translation of which is inserted in the second volume of the *Memoirs of the Literary and Philosophical Society of Manchester*) after having exposed and illustrated the vegetable œconomy, in his concluding observations, remarks, that the chain of being is continued from animals to plants, and that it is in vain to attempt to establish rules by which plants may be distinguished from animals in all cases. From some circumstances common in the generation, structure, and pathology of animals and plants, he is inclined to believe that plants are not, as is generally imagined, destitute of sensation. Dr. *Percival*, in an ingenious paper 'on the perceptive power of vegetables,' in the same volume of memoirs, has stated arguments with great force and perspicuity, tending to establish the opinion, that plants, as well as animals, are endued with perception in different degrees. The opi-

nion is certainly far from being irrational: perception, as a faculty, is like others, susceptible of degrees; and the general order of things sufficiently evinces, that a gradation in the powers and faculties of created beings, is an established principle in the laws of nature. In addition to what these authors have advanced on the analogy of plants to animals, it may be observed that plants sleep in the night, and young ones in both cases require more than old ones; also plants, like animals, grow more in the night than in the day. † Vegetables, as well as animals, perspire more in hot sunshiny weather than in cold; like animals, they have lungs by which they breathe, and, like them too, they are subject to disease, both local and general, and to loss of limb as well as life. Plants shed their leaves as birds do their feathers, and quadrupeds their hair. Plants, like animals, require

† *Diseases of Trees.* — There is no limit to the researches of modern philosophy. We find the following curious morsel in a Treatise on the Maladies of Elms, read at the late *Institut* at Paris:—

“ It is a long time since the Abbe *Roger Schabol* has shewn, with much sagacity, the resemblances which subsist between the animal and vegetable œconomy, and the similitude both of the maladies and remedies, particularly in those which are called Surgical Cases. We may apply this theory to all the maladies which arise from checked transpiration and interrupted circulation.

“ Trees are animated; they have their food, their enjoyments, their grief, their health, their illness, their watching, their sleep, their emanations, their absorptions, their infancy, their growth, their puberty, their manhood, and their love.

“ The antients placed a nymph under their rind: to be sure she is there. Life is a very pretty nymph. We ought to respect her wherever she is found.

“ The man who does not find in animals younger brothers, and in plants cousins more or less removed, is unacquainted with his own nature, and is devoid of the elements of morality.”

different sorts of food, and will go in search of them. Plants will regenerate their dismembered parts, and animals their lost limbs and several other parts.* The circulation of the fluids in vegetables bears a great analogy to that of animals.†

The learned Dr. *Watson*, Bishop of *Llandaff*, in his elegant Essays on the subjects of Chemistry, has made some very pertinent observations on the three kingdoms; which my reader will excuse me for quoting at some length. He says, ' If it be asked what are the discriminative characteristics of minerals, vegetables, and animals, as opposed to one another, I plainly answer that I do not know any, either from natural history or chemistry, which can wholly be relied upon. Systematic distinctions and specific divisions of things are useful in enlarging the comprehension of the mind. By methodizing the objects, they seem to extend the boundaries of knowledge; but having no real foundation in nature, they should not be depended on too far; they often perplex or impede the progress of a curious enquirer. This prepossession in favour of systematic arrangements, operates the more forcibly upon us as the ideas to which it is usually annexed become the more abstracted. The strongest analogies are overlooked, the plainest reasonings thought fallacious, and decisive experi-

* See Bishop *Watson's* Essays on the subjects of Chemistry; and my paper on the Regeneration of Animal Substances, *Manchester Memoirs*, Vol. I.

† See Note (1) at the end.

‘ ments inconclusive, when their tendency is to subvert a
 ‘ distinction of which we had wrongly supposed Nature her-
 ‘ self the author. Every one thinks he knows what an
 ‘ animal is, and how it is contradistinguished from a vege-
 ‘ table; and would be offended at having his knowledge
 ‘ questioned thereupon. A dog or a horse, he is truly per-
 ‘ suaded, are beings as clearly distinguished from an herb or
 ‘ a tree, as light is from darkness; yet as in these, so in the
 ‘ production of nature, the transition from one to the other
 ‘ is effected by imperceptible gradations. Naturalists as well
 ‘ as Chymists have perhaps too precipitately embraced the
 ‘ opinion, that minerals may be certainly and readily distin-
 ‘ guished from the other two kingdoms. A vascular system,
 ‘ a nutritive succus, and a power of producing its like, con-
 ‘ stitute the abstract idea both of a vegetable and an animal
 ‘ as contradistinguished from a mineral: this idea is clear
 ‘ and definite in itself; but to determine how far the coex-
 ‘ istence of these qualities is in the nature of things necessary,
 ‘ or where any of them ceases to exist, is a question of vast
 ‘ difficulty, when applied to particular cases. Stones dug out
 ‘ of quarries, ores out of mines, in general minerals separated
 ‘ from their matrices, are like the dead branches or limbs
 ‘ of vegetables or animals, incapable of receiving increase,
 ‘ except from an external incrustation; but whether the
 ‘ matrices themselves increase, or, that being in some cases
 ‘ granted, whether they receive their augmentation from
 ‘ an external apposition, or an internal assimilation and
 ‘ extention of parts, cannot readily be decided either way.

‘ In the Cretan Labyrinth it hath been observed, that the
 ‘ names of travellers, which have been cut in the rock in
 ‘ former ages, are now in *alto rilievo*; and the older the
 ‘ dates are, the greater is the protuberance, resembling the
 ‘ callus formed by the incisions in trees. In the mines in
 ‘ *Chremnitz*, in *Hungary*, which have been wrought for
 ‘ above one thousand years, the ancient roads which had
 ‘ been cut through the rocks are left to grow up; and it
 ‘ is remarked that they approach one another in an hori-
 ‘ zontal and not in a perpendicular direction. The same
 ‘ phenomenon may be observed in the marble quarries in
 ‘ *Italy*, as is mentioned by *Baglivy*, in his Treatise upon the
 ‘ Vegetation of Stones: but whether these, and many similar
 ‘ appearances, are to be attributed to the pressure of the
 ‘ superincumbent *strata*, or to a kind of vegetable growth,
 ‘ is a doubtful point. Rock-cryſtal, amethyſts, and various
 ‘ precious ſtones have been thought by *De Boot* to grow
 ‘ like muſhrooms. Certain it is that they often con-
 ‘ tain in them ſeveral heterogeneous particles: a circum-
 ‘ ſtance which proves them to have been once in a fluid
 ‘ ſtate, and induces a ſuſpicion, that in their formation they
 ‘ may reſemble the gums and reſins extravafated from va-
 ‘ rious ſpecies of vegetables. The vegetation of ſtones
 ‘ hath been admitted by many; and ſome have contended
 ‘ that minerals, as well as animals and vegetables, ſpring
 ‘ from ſeed; the greateſt being nothing but the expansion
 ‘ of the parts of a minute grain of ſand.’

Again, the learned Bishop further adds,—‘Many minerals
 ‘ seem in their formation to have been antecedent, others
 ‘ subsequent to the universal deluge. A great part of the
 ‘ matter constituting the outward shell of the earth (the
 ‘ only part which we can examine) hath been subservient
 ‘ to vegetable or animal life. All the *strata* of limestones,
 ‘ chalks, marbles, all gypsums, spars, alabasters, &c. are
 ‘ confessedly of animal origin. The *strata* of pit-coal and
 ‘ of all bituminous fossils, of some species of flates, whate-
 ‘ ver may be thought of argillaceous *strata* in general, the
 ‘ mould everywhere covering the surface of the earth and
 ‘ other substances, are supposed probably enough to have ari-
 ‘ sen from the destruction of vegetables; so that I know not
 ‘ whether it would be a very extravagant conjecture which
 ‘ should suppose that all matter is, or has been, organized,
 ‘ enlivened, animated.’

If then, according to the opinions of the above-mentioned excellent naturalists, we are not able to draw lines of distinction between the three kingdoms; if we cannot point out where sensation ends, nor ascertain whether organization does not always imply some degree of concomitant sensation, we may fairly infer, till the contrary can be proved, that Nature descends by gradual and imperceptible steps from man down to the least organized beings; that one sort of sensation is given in greater perfection to one creature, and another sort to another; so that often the excesses in

the one hand must nearly compensate for the defects in the other, and thereby make it difficult to form a comparative estimate of the sum total of their sensitive powers.

In surveying the productions of the different climates and regions of the earth, the following observations naturally arise:—The animal world, particularly domestic animals subservient to the use of man, are in the greatest perfection in the temperate zone; as horses, cows, sheep, goats, swine, dogs, &c.

The vegetable world is in the greatest perfection in the torrid zone, both trees, shrubs, fruits, spices, roots, poisonous plants, and medicinal plants; as the mahogany-tree, sweet smelling cedar, the fustic-tree, *magnolia grandiflora*, Peruvian bark-tree, bread-fruit-tree, oranges, lemons, citrons, shaddocks, limes, fruit-bearing passion-tree, marginese-tree, cinnamon, cloves, nutmegs, pine-apples, melons, *bohun upas*, or poison-tree of Java, and aloes; likewise those plants which more peculiarly exhibit tokens of sensation; as the sensitive plant, moving plant, Venus's fly-trap, &c.

The vegetable world appears to be in the least perfection in the frigid zone.

The most ferocious animals live in the torrid zone, and also the most venomous and poisonous.

Animals have the longest hair upon their bodies in the frigid zone, to serve them as a defence against cold; but animals which naturally inhabit the torrid zone have the thickest skins, to defend them from the heat.

The lowest order of animals, or those which approach nearest to vegetables, are inhabitants of the watery element, or live in the earth; such as the water-polypus, lithophytes, zoophytes, corals, corallines, sea-worms, earth-worms, and lalan-lout.*

Insects and reptiles, both for size and colour, are in the greatest perfection in America, or what is called *the new world*.

Those animals that approach nearest to man in figure, in intelligence, or in the faculty of speech, inhabit the torrid zone; as orang-outangs, or wild men, elephants, and parrots.

Many animals and vegetables, both those that live on land and in water, are adapted to the torrid zone, and cannot live in the frigid, or even the temperate zone; and *vice versa*. The rein-deer, the glutton, and the marmott, cannot subsist even in a temperate climate, but are confined to the frozen regions; and the large white bears cannot live in the torrid zone by any art, nor even in the tempe-

* See Philosophical Transactions, vol. 68, page 178.

rate zone, unless their keepers are perpetually throwing cold water upon them. The elephant, rhinoceros, and camel, and many other animals, cannot live in the frigid zone by any contrivance; nor can they exist in this temperate climate without warm clothing and a warm stable. Some fishes, as well as birds of passage, are obliged * to change their climate when it is either too hot or too cold for them. Several plants will not grow in warm climates; and very many will not grow in cold ones.

It appears then that most animals and vegetables are adapted to some particular climate, soil, or situation, and cannot flourish in any other without great art and care: even with these they seldom arrive at the perfection attained in their proper climate; nor will any length of time habituate them to a different region. Melons, cucumbers, and several other plants have gone through above a hundred generations in this kingdom, and still they bear the climate no better than at first; from which it may be concluded that no time, however long, will assimilate their constitution to that of our indigenous plants. The experience of our gardeners sufficiently proves, that in order to preserve a collection of exotic plants in tolerable perfection, it is necessary to procure for them every diversity of temperature, soil, and situation which may be suited to their respective exigencies.

* Dr. *Darwin* denies that birds emigrate from necessity: he argues that emigration is with them a matter of choice. *Zoonomia*, page 167.

The gradation that exists in the animal kingdom, extends to the organs of sensation, as these differ in different subjects with respect to sensibility, dimensions, figure, &c. It also extends to the various dispositions in the animal economy. It may be traced from the brain of the human European, which is the largest of any animal we are acquainted with, be its size ever so enormous, to the polypus, who has none at all—from the keen eye of an eagle and a hawk, and the great number of eyes of a fly, to those animals that have none, as the blind worm—from the acute olfactory nerves of a dog, to those animals who have not the faculty of smelling—from the large ears of an ass, to those that are void of that organ—from animals whose feeling is exquisite, to those that have comparatively little sensation—from the catamenia of an European female, to those animals that have no such discharge—from animals that have the greatest evacuation by sweat, to such as have not that discharge, as the dog—from the quills of the porcupine, the spines of the hedge-hog, and the long coarse hair of an arctic bear, to the soft sleek hair of the mole and the dormouse—from the thin skin of the human European face, to the thick coat of mail of the elephant and the rhinoceros—from the milk white to the jet black colour of many animals and vegetables, both birds, quadrupeds, fishes, insects, reptiles, and the flowers of plants—from the high prominent nose of the human European, to those that are perfectly flat—from the projecting chin of man, to those animals who

have no chin—from the perpendicular face of the human European, to the horizontal one of the woodcock—from the short jaw-bone of man to that of the whale, which is the longest known—from the double row of sharp teeth of the shark, the grinders and tusks of an elephant, and the teeth of a lobster, which are placed in the stomach, to those which have none—from the gizzard of a bird, which is composed of two strong muscles placed opposite to and acting upon each other as two grindstones (the two flat lateral surfaces of the grinding cavity being lined with a thick horny substance) to the most tender membranous stomach, which digests the food by its own gastric juice, the former being more peculiarly adapted for vegetable and the latter for animal food—from those animals which bring forth but one at a birth, to those who are seen to produce a thousand, as the spider and the beetle.

• *Lavater* is of opinion, that the same gradation holds good in physiognomy; he says, ‘From the weakest of winged insects up to the towering eagle, from the worm which crawls under our feet, up to the elephant, up to the formidable lion, you everywhere discover a gradation of physiognomical expression.’

M. *Bonnet* observes, that if we survey the principal productions of nature, we shall perceive, that betwixt those of a different class, and even those of a different species, there

will always be found some which will apparently link the classes or species together. The polypus forms the most striking instance, which combines the properties of an animal with those of a vegetable.* He has given us a scale of beings on the principle of gradation, and pointed out those particular subjects which seem to connect the different classes, so as to form but *one* group of organized bodies. Whatever exceptions may be made to the scale, it is certainly ingenious; and as it bears a near relation to the subject before us, we shall give it a place.

* See Note 3.

IDEA OF A SCALE OF NATURAL
BEINGS.

By M. BONNET.

Man.

Orang-outang
Monkey

Quadrupeds.

Flying squirrel
Bat
Ostrich

Birds.

Aquatic bird
Amphibious bird
Flying fish

Fish.

Creeping fish
Eel
Water-serpents

Reptiles.

Slug
Snail

Snails (with shells)

Pipe-worms
Moth

Insects.

Gall-insects
Tape-worm
Polypus
Sea-nettle
Sensitive plant

IDEE D'UNE ECHELLE DES ETRES
NATURELS.

PAR M. BONNET.

L'homme.

Orang-outang
Singe

Quadrupeds.

Ecureuil volant
Chauve-fouris
Autruiche

Oiseaux.

Oiseau aquatique
Oiseau amphibie
Poissons volans

Poissons.

Poissons rampans
Anguilles
Serpens d'eau

Serpens.

Limaces
Limaçons

Coquillages.

Vers à tuyau
Teignes

Insectes.

Gallinsectes
Tænia, ou solitaire
Polypes
Orties de mer
Sensitive

Plants.

Lichens
Mouldiness
Mushrooms
Truffles
Coral
Lithophytes
Amianthes
Talcs, Gypsums, Selenites
Slate

Stones

Figured stones
Chrystallized stones

Salts.

Vitriols

Metals.

Semi-metals

Brimstone.

Bitumens

Earths.

Pure Earth

Water.

Air.

Fire.

More Subtile Matter

Plantes.

Lychens
Moissiffures
Champignons agarics
Truffles
Coraux & coralloides
Lithophytes
Amianthe
Talcs, Gyps, Selenites
Ardoises

Pierres.

Pierres figurées
Chryftallizations

Sels.

Vitriols.

Metaux.

Demi-metaux

Soufres.

Bitumes

Terres.

Terre pure

Eau.

Air.

Feu.

Matieres plus subtiles

OBSERVATIONS
ON THE GENUS OF ANIMALS CALLED *CANIS* BY NATURALISTS.

LINNÆUS reckons fourteen species: — 1. The Dog; 2. the Wolf; 3. Hyæna; 4. Mexicana; 5. Fox; 6. Lagopus, or Arctic Fox; 7. Indica, or Antarctic Fox; 8. Grey Fox of Catesby; 9. Silver Fox of Louisiana; 10. Barbary Fox, or Jackall alive; 11. Jackall; 12. *Ma-fomales*; 13. *Thous*; and, 14. *Zerda*.

It is almost impossible, in many cases, to determine where one species ends and another begins. *Buffon* was of opinion that all animals that would breed together, and whose progeny would breed again, were of the same species. If this were true, the wolf, the jackall, and the dog should be one species; for Mr. *J. Hunter* has proved that they will breed together, and that their issue will breed again: and I have been very credibly informed that the same thing has frequently happened betwixt the dog and the fox; but of this Mr. *Hunter* had some doubts. These unnatural unions, however, are seldom obtained without some stratagem.

Linnaeus enumerates eleven, *Buffon* no less than twenty-seven varieties in the species of the domestic dog. All dogs can swim; but there is great difference in this re-

spect, as some are peculiarly adapted for the water, and seem most happy when in it; others never go in but by compulsion. There subsists a gradation in the constitution, faculties, and organs of the different sorts of dogs. The hound, beagle, &c. excel in smell: the bull-dog has this sense less acute than many others. Some dogs hunt their prey in the fields and woods, and others under ground, being severally adapted to those particular purposes. The bull-dog has a short round head and strong jaws, betwixt which and the long narrow head and slender jaws of the grey-hound, there are several intermediate degrees. The coat of the dog varies, from that of the long rough haired Pomeranian dog to the Turkish dog without hair; nor does this depend altogether upon climate, as many dogs are covered with hair in a much hotter climate than that of Turkey; and some dogs have long and others short hair in the same climate. There is a variety in the bark, howl, or cry of dogs: the bull-dog and mastiff bark very loud, and the alco, the native dog of the West India islands, never barks at any time: the grey-hound barks little; and the hound in giving mouth has a particular howl or cry, called the Tongue. The nose of dogs is longer than that of man, and better adapted internally for acute smelling, having a longer convoluted surface on which the *membrana pituatoria* is spread: the same structure is observable in other quadrupeds, most of which have the *ossa spongiosa* large, and subdivided into a great number of excessively fine thin *lamellæ*. The sensibility seems indeed to be always increased in proportion to the surface of the organ.

It will be proper here to observe, that dogs have no *frænum præputii*, and that a bitch has a larger *clitoris* than perhaps any other animal.

There is a great number of different sorts of wolves, foxes, and of all the other species of *canis*, some of which approach so near to the dog, that it is almost impossible to determine where the species begins and ends. So many varieties of dogs have been further produced by crossing the breed, that one might expect no one sort would remain entire; and yet they all seem to be preserved in as great perfection as ever. Does not this afford a strong presumption that the different sorts of dogs are in reality distinct species?*

The cries of the wolf and the jackall are very similar; they are principally conveyed through the nose, and exactly resemble that noise in dogs which is a mark of longing or melancholy, and also of fondness; but they have never any resemblance to the barking of a dog.

It would be endless to attempt to shew the gradation of animals in its full extent: I shall therefore only make some

* See Note 2.—Dr. *Anderson*, in an Appendix to “An Account of the different Kinds of Sheep found in the Russian Dominions,” strenuously maintains that the different sorts of dogs are distinct species: he also makes some pertinent strictures upon Buffon, in regard to this matter. His ideas on the subject nearly agree with mine, except where he argues that the produce of a mongrel cannot in any

observations upon a few genera out of one or two classes, selecting those which, in the arrangements of natural history, rank nearest to man, as the order of *primates* in the class of *mammalia*. The lowest genus of this order is,

VESPERTILIO; OR, THE BAT.

There are at least 22 species of this genus. The *penis* is loose and pendulous: a circumstance peculiar to mankind, monkeys, and to this genus.

LEMUR; OR, MAUCAUCO.

There are about a dozen species of this genus. ‘ It forms a kind of link between the race of apes and the ferocious quadrupeds, having the flat nails of the former combined with the crooked claws of the latter; and, except in the hand-like use of the paws, having no resemblance to mankind. All the species of this genus, except one which is very little known, inhabit the torrid regions of Asia and Africa.’

KERR’S LINN. p. 83.

SIMLÆ; OR, APES.

In this genus are included apes without tails, baboons with short tails, monkeys with long tails and cheek pouches;

number of generations attain to the original purity of either of its ancestors. The fact seems to be, that in a few generations if it be confined to one kind only, the offspring is not to be distinguished from those of that kind.

all which are inhabitants of the old continent; and the sapajous with prehensile tails, and sagouins with long tails and no cheek-pouches; both which are inhabitants of the new continent. The apes without tails are divided by some into two classes; those that walk constantly in an erect position, as some orang-outangs, and those that walk occasionally on all four.

The species of *simiæ* are more numerous than of any other animals, there being no fewer than 84. They are mostly confined to the torrid zone, a single species only being found beyond the tropic, in Barbary. They are also for the most part gregarious, and herd together in vast companies; but the different species never mix with each other. Some apes, as likewise the maucauco, the bat, and the urchin, go together in pairs; a male and female entering into a monogamous society, and rearing their young ones by a joint concern. *Simiæ* have a greater resemblance to man in their external and internal form, and in all their actions and faculties, than any other creatures.

None of the genera of animals above mentioned exhibit so complete a gradation as the *simiæ*. We meet with some of an upright position of body, and others of an horizontal one; some have their face nearly in the same line as their body, others have the long projecting horizontal snout of the ferocious animals. There are bimanus and bipeds,

quadrumanus and quadrupeds: the descent in this respect is so gentle, that Dr. *Tyson's* pigmy, when it walked as a quadruped, rested upon its knuckles, and never touched the ground with the palms of its hands. Some apes, baboons, and monkeys have regular catamenia*; sapajous and sagouins have no such discharge. There is a wonderful variety in the tails of this genus: some have tails twice as long as their bodies, and prehensile, that is adapted to lay hold of objects as a hand; others again have none at all. The magot, or Barbary ape, serves as a link to connect the apes and baboons: it has a small portion of skin at the rump which gives it the appearance of a tail. The next is the little baboon; one of which I have seen whose tail was not an inch long. After this comes the crested baboon, whose tail is seven inches long. The *simia nemestrina*, or pig-tailed baboon, in like manner forms a link between the baboons and monkeys. The douc is an animal allied to the monkeys, but at the same time has some resemblance to the sapajous.†

Mr. *John Hunter*, in his observations on certain parts of the animal œconomy, speaking of the placenta of a monkey,

* Le Gibbon, Le Magot, &c. les femelles font comme les femmes, sujettes a un ecoulement periodique de sang. *Buffon*, tom. 14.

Simia——femina menstruat. *Linnaei Syst. Nat.* tom. 1. p. 25.

† Here it is necessary to discountenance the opinion of Lord *Montboddo*, that some of the human species have tails. Were this true, it would break the law of gradation; for, in descending through the species of apes, we meet with no tails till we reach the baboons, which are farther removed from man than the apes are.

says, ‘ the after-birth was preserved and entire, and was perfectly fit for examination : it consisted of placenta, with the membranes and navel-string ; which all very much resembled the corresponding parts in the human subject.’ He likewise says, ‘ the female has her regular periods for the male ; but she has commonly too much complaisance ever to refuse him. They carry this still farther ; for they receive the male when with young, and even when pretty far gone. This was the case, however, with the one I am going to give an account of.’—This circumstance, I believe, is peculiar to the human race and to *simiæ*.

The human species and *simiæ* are destitute of that strong elastic ligament called *pax-wax*, or *tax-wax*, which quadrupeds possess as a kind of stay-tape, to prevent the head from sinking to the ground. In both, the eye-lids are moveable ; but in most other animals the upper eye-lid only is capable of movement. The *simiæ* have long fore-arms and flat feet, a large *clitoris* and *penis*, small *testes* and *scrotum*. The human species, *simiæ*, squirrels, and such other animals as use the fore-feet instead of hands, have collar-bones, which allow them a more perfect use of their limbs in climbing ; but when they go on all four, they walk but very indifferently.

Respecting the policy of baboons and monkies, travellers inform us, that when those animals are going to sleep, or about

to commit depredations upon orchards and gardens, they always guard against a surprize, by appointing one of their body to act as sentinal, whose life is forfeited in case of misconduct or neglect.

It has been thought wonderful that apes, which so nearly resemble man in their organization, and possess such a remarkable degree of sagacity, should be totally destitute of speech. This circumstance has been adduced as a proof of their great inferiority to man. Professor *Camper*, however, informs us in a paper published in the Philosophical Transactions, vol. 69, that he had discovered, from the structure of the organ, the real reason why the orang-outang, and several other apes and monkeys are unable to speak. He observed that the basis of the *os hyoides* was very large and hollow, and that a membranous bag lying under the *latissimi colli* (which touch one another in the middle of the neck in these animals) went up into this long cavity, having also a communication with the inside of the *larynx*, by a hole at the root of the *epiglottis*. He says, ‘ Having
 ‘ dissected the whole organ of voice in the oranges, in apes,
 ‘ and several monkeys, I have a right to conclude, that o-
 ‘ rangs and apes are not made to modulate the voice like
 ‘ men; for the air passing by the *rima glottidis*, is im-
 ‘ mediately lost in the ventricles or ventricle of the neck,
 ‘ as in apes and monkeys, and must consequently return
 ‘ from thence without any force and melody within the

‘ throat and mouth of these creatures; and this seems to
 ‘ me the most evident proof of the incapacity of oranges,
 ‘ apes, and monkies to utter any modulated voice; as in-
 ‘ deed they never have been observed to do.”*

Naturalists have found it difficult to assign a reason why *America*, when first discovered by the Europeans, should be inhabited by a race of animals of which the greater part was unknown to the other continent. The fact does not well accord with the opinion of those who imagine that the new world received its inhabitants from the old. That some animals common to both, in the colder climates, may have emigrated from one continent to the other, is not improbable; but that none of the inhabitants of the torrid zone in America should be found on the other continent, is a circumstance totally inexplicable on the hypothesis of emigration. The supposition that such animals are now extinct in the eastern continent, cannot surely be expected to gain any credit.†

* Since the above was written, an opportunity occurred of examining the throat of a monkey, when Dr. Holme was so obliging as to assist Mr. Bennet and my son in the dissection of the animal. Its result was a happy confirmation of what Professor Camper had discovered. The membranous bags under the *latissimi colli*, and a preparation of them, was exhibited to the Society at one of the meetings when this paper was read.

† Jefferson in his *Notes on the State of Virginia*, page 94, speaking of quadrupeds, says, ‘ By these it appears there are 100 species aboriginal of America. Monf. *De Buffon* supposes about double that number existing on the whole earth.

The colour of *simiæ* does not depend upon climate ; for those that inhabit the torrid zone are white as well as black, brown, tawny, yellow, and of many other colours. It is remarkable that *simiæ* have no lips, at least none that will admit of comparison with those of mankind ; lips being unnecessary to animals destitute of the faculty of speech.

In the Memoirs for a Natural History of Animals, first published in French at Paris, it is asserted that the clitoris in monkeys is proportionably greater and more visible than in women.

AFTER promising these general observations on the genus *Simiæ*, I shall now speak more particularly of some that approach nearest to man, as the different species of orang-outang, borrowing from the statements of naturalists and travellers an account of the forms, habits, manners, &c. of those animals. — Professor *Gmelin's* edition of the *Systema Naturæ*, as translated by Mr. *Kerr*, describes them as follows :

“ Apes. (*Simiæ*) Have no tails. The visage is flat ; the teeth, hands, fingers, feet, toes, and nails, resemble those

Of these Europe, Asia, and Africa furnish (suppose) 126 ; that is, the 26 common to Europe and America, and about 100 which are not in America at all. The American species then are to those in the rest of the earth as 100 to 126, or as 4 to 5. But the residue of the earth being double the extent of America, the exact proportion would have been as 4 to 8.’

of man; and they walk naturally erect. This division includes the simiæ, or apes, properly so called, of the antients, which are not found in America.

“ 1. Chimpanzee.—*Simia troglodytes*; Great Ape. Has no tail. The head is conical; the whole body is of a robust brawny make; the back and shoulders are covered with hair, and the rest of the body is naked. It inhabits *Angola*,* &c.

“ 2. Orang-outang—*Simia fatyrus*—*Homo fylvestris*, or wild man of the woods.—Has no tail. Is of a rusty brown colour; the hair on the fore-arms is reversed, or stands upwards; and the buttocks are covered with hair. Inhabits the island of *Borneo*. Is about two feet, and walks mostly erect.

“ 3. Pongo—*Simia fatyrus pongo*—*Homo fylvestris*; Orang-outang.—Has no tail, no cheek-pouches, and no callosities on the buttocks, which last are plump and fleshy; walks always erect, and is between five and six feet high. All the teeth are similar to those of man. The face is flat, naked, and tawny; the ears, hands, feet, breast, and belly, are likewise naked; the hair of the head descends on both temples in the form of tresses; the hair on the back and

* See Note 4th.

loins is in small quantities. It has not been ascertained whether the females of this species or variety, are subject to periodical discharges; but analogy renders this almost unquestionable.

“ 4. Jocko—*Simia fatyrus* Jocko, resembles the former. The one seen by the Count de *Buffon*, was about two feet and a half high, and, by the information of his proprietor, was only about two years old. He walked always erect; his air was melancholy, his gait grave, his movements measured, and his dispositions gentle, without any of the mischievous tricks, impatience, maliciousness or extravagance of other apes, baboons, and monkeys. He was remarkably docile and imitative of the actions of mankind, requiring only signs and words to make him act, while other apes require to be managed with blows: would present his hand to visitors, sit down at table, unfolded his napkin, wiped his lips, used a spoon or a fork, poured his liquor into a glass, which he made to touch that of the person who drank along with him; would bring a cup and saucer to the tea-table, put in sugar, pour out the tea, and allow it to cool before he drank. He ate almost every thing that was offered, but preferred ripe and dried fruits and sweetmeats; drank a little wine, but frequently left it for milk, tea, or other mild liquors. He was troubled with a cough, lived one summer at Paris, and died in London the following winter.

“ 5. Great Gibbon—*Simia, longimana*; Long-armed ape. Inhabits India, particularly Coromandel, Malacca, Sumatra, and the Molucca islands. Of a mild and slothful disposition, impatient of cold and rain: is about four feet high, of a black colour, with a swarthy face, and approaches nearer to the manners of mankind than even the orang-outang; being more inclined to the erect posture. It is named Golok in India. There are slight callosities on the buttocks. The face is flat, brown, and surrounded with a circle of grey hairs: the canine teeth are proportionably longer than those of man: the ears are naked, black, and round: the eyes are large and sunk: the arms are so enormously long, that when walking erect he can reach the ground without bending the body. The female has the catamenia. This animal is about three feet high when standing erect, but sometimes grows to be as tall as a man: it is of a tranquil disposition, and of gentle manners, receiving mildly what is given to it, and feeding, at least in confinement, mostly on bread, fruits, and almonds.”

Professor *Gmelin* mentions the *simia nasalis* (so called on account of the elegant figure of its nose) as a newly discovered species of ape, which resembles mankind more nearly than any other species hitherto known. He informs us that a particular description of it may be speedily expected from the pen of the celebrated *Daubenton*.

In the 59th vol. of the Philosophical Transactions, there is an abstract of a letter from *Stephen de Visne*, Esq. at Canton in China, in which he says, ‘ Perhaps the drawing which
 ‘ I now send you of a singular sort of monkies, male and
 ‘ female, may not prove unacceptable. These animals are
 ‘ called *Golok*, or wild people; and are thought to be originally a mixture with the human kind, having no tails.
 ‘ They come out of the forest in the interior part of Bengal, from the country called Mevat. They inhabit the woods;
 ‘ their food is fruit, leaves, bark of trees, and milk; flesh only when caught. They are very gentle, and extremely modest. They are of the height of man; their teeth
 ‘ are as white as pearls; their legs and arms are in due proportion to their body, which is very genteel. Some of
 ‘ them were brought to Decca; and what I now send you
 ‘ is a copy of the original drawing.’

M. Gmelin is of opinion that this is the same animal which is described under No. 4, Jocko, *Simia satyrus jocko*; and *homo sylvestris*, orang-outang by Dr. Tyson, in his anatomy of a pigmy. According to this last author, Man and the orang-outang are the only animals that have buttocks and calves of the legs, and who of course are formed for walking erect; the only animals who have a broad chest, flat shoulders, and vertebræ of the same structure; the only animals whose brain, heart, lungs, liver, spleen, stomach, and intestines are perfectly similar, and who have an appendix

vermiformis, or blind gut. He likewise says, ‘ The rising
 ‘ of the cranium just under the eye-lids, as I have remarked,
 ‘ is different from what it is in man, and renders the face
 ‘ harder, as does likewise its flat nose, and the upper jaw
 ‘ being more prominent and lesser spread than in man, and
 ‘ its chin, or under jaw being shorter. The eyes were a
 ‘ little sunk, the mouth large, the teeth perfectly human;
 ‘ the face without hair, and the colour a little tawny. The
 ‘ skin, or the rest of the body, was white.’ Dr. *Tyson* adds,
 ‘ I heard it cry myself like a child.’

The female orang-outang of *Bontius** is described with large pendulous breasts; and the same circumstance is noted by *Tulpius*†. *Gassendus*‡, in the life of *Peiresky*, speaking of the *Barris*, saith, *Huic mammæ ad pedis longitudinem.*

All those who have had opportunities of making observations on the orang-outangs, agree in ascribing to them, not only a remarkable docility of disposition, but also actions and affections similar to those observable in the human kind. — They make themselves huts for their accommodation; they defend themselves with stones and clubs; and they bury their dead by covering the body with leaves, &c. They discover signs of modesty: and instances are related of the strongest attach-

* Jac. Bontii Hist. Nat. & Med. lib. 5. cap. 32. pag. 84.

† Nu. Tulpii Observ. Med. lib. 3. cap. 56.

‡ Gassen. de Vita Peireskii, lib. 5. pag. 170.

ment of the male to the female. When sick, these animals have been known to suffer themselves to be blooded, and even to invite the operation; and to submit to other necessary treatment, like rational creatures. They groan like the human kind, when under circumstances of anxiety or oppression: and their sagacity in avoiding danger, in certain instances, is not exceeded by that of man. They have been taught to play upon musical instruments, as the pipe and harp. They have been known to carry off negro-boys, girls, and even women, with a view of making them subservient to their wants as slaves, or as objects of brutal passion: and it has been asserted by some, that women have had offspring from such connections. This last circumstance is not, however, certain. Supposing it to be true, it would be an object of enquiry, whether such offspring would propagate, or prove to be mules.

Linnaeus says, the orang-outang lives twenty-five years; likewise, that he makes a hissing noise in speaking. But it must be acknowledged, that in speech, if it can be called such, the orang-outang falls far short of the feathered tribe; particularly of parrots, jays, and bullfinches; upon which we shall now make a few observations.

MAN, considered *in toto*, is undoubtedly entitled to pre-eminence over the animal world: but various tribes of crea-

tures make great advances towards him, in some particular powers and faculties, and even, in some instances, far surpass him. The orang-outang has the person, the manner, and the action of man; the parrot, the bullfinch, &c. have such vocal organization as to command the powers of speech, of singing, and whistling; while the elephant enjoys the faculty of reason in an eminent degree.

It is observable that no animal, whether bird or quadruped, that approaches near to man in its faculties or energies, has a flat skull.—Lavater, speaking of birds, says, ‘ their distinction of character or gradation of passive and active powers, is expressed by the following physiognomical varieties—by the form of the skull: the more flat the skull, the more weak, flexible, tender, and sensible is the character of the animal. This flatness contains less, and resists less.—By the length, breadth, and arching or obliquity of their beaks—and here again we find, that where there is arching, there is a greater extent of docility and capacity.’

The goose, which has a flat skull and a flat bill, has so little sense, that its name is proverbial; but the ostrich, which has the flattest skull and the flattest bill of all birds, is of all animals, whether birds or quadrupeds, the most foolish, having no sense that we know of in perfection. It seems neither to have the faculty of smell, nor of taste, as it

makes no distinctions in food, but will eat its own excrements, or iron nails indiscriminately. None of the drawings which I have seen of this bird are correct; the head being much flatter than they represent, and the eyes much larger, and placed higher in the head. In short, it has the flattest skull of any animal we are acquainted with, the smallest head in proportion to the body, and the largest eyes in proportion to the head; so that, owing to the smallness and flatness of the head, and the size of the bony sockets which contain such large eyes, there is very little room for *cerebrum* or *cerebellum*.

The parrot (*psittacus*) which is of the order of *picæ*, or pies, (see KERR's *Linnæus*) is a genus of birds remarkable for the hookedness of their bills, for the largeness of their heads, and also of the tongue, which is blunt, rounded, and fleshy. This genus contains numerous species (according to *Linnæus*, one hundred and sixty-six) and seems to form a tribe peculiarly distinguished from all others. It may, however, be considered as holding the same place among birds as that of apes and monkeys does amongst the *mammalia*. The natural voice of parrots is loud, harsh, and unpleasant; but they imitate a variety of sounds, and particularly the human voice, often learning to articulate words with remarkable precision. They are chiefly found in the tropical regions: they feed upon nuts, fruits, and seeds, and live to a great age.

It would be unnecessary to relate particular instances of the great docility of parrots in acquiring speech, as the fact is generally known. But it should not be understood that they are destitute of thought and reflection about what they speak, since many authentic instances might be adduced of having discovered much reflection and discriminative accuracy in the application of their speech to particular occasions*. Dr. *Monro* says, ‘ In one species of bird (the parrot) I long ago remarked that the pupil was affected by the passions of the mind of the animal, independent of the light upon the eye.’ *Monro on the Nervous System*, page 96.—Some say, that the tongue of this bird somewhat resembles that of man, and by this conformation they pretend, it is so well qualified to imitate the human speech. But the organs by which these sounds are articulated lie farther down in the throat: and the great mobility of the *os hyoides*, which is remarkable in these birds, contributes very much to produce the effect.

The raven and the magpie may be taught to speak like the parrot. It is asserted that the raven has been taught to sing a tune like a man. The magpie’s voice is too acute and sharp to imitate the human voice, though it should articulate distinctly.

Singing birds, although destitute of the power of articulating, are expert in acquiring parts of artificial tunes; in re-

* See note 6.

peating which they attend to the time and the tone with the greatest nicety. The bullfinch, though not naturally musical, may, when tamed, be taught to whistle any tune; and, in other respects, becomes extremely docile. The voice of birds is incomparably louder in proportion to their size than that of other animals: thus, the screaming of a peacock is much louder than the bellowing of an ox. In all countries birds exceed quadrupeds in longevity.

Mr. *Jefferson*, in his *Notes on the State of Virginia*, speaking of the bee not being a native of America, says, 'They furnish then an additional proof of the remarkable fact first observed by the Comte *de Buffon*, and which has thrown such a blaze of light on the field of natural history, that no animals are found in both continents, but those which are able to bear the cold of those regions where they probably join.' *Buffon* also observes, 'that not a single animal of the torrid zone is common to the old world and to the new.' To which we may add, that none of the domestic animals of Europe were found in America when it was first discovered.

The observation will apply to the human species also; for none were found similar in the two worlds but such as were near the frigid zone, where there was a probability of their communication. There were no negroes, nor European whites to be found in the whole continent of

America; nor any red copper-coloured Indians, either in Europe, Asia, or Africa. As, therefore, many different species of animals have been discovered in America which were not known either by the antients or moderns ever to have existed either in Europe, Asia, or Africa, how can we suppose they were placed there, except by the immediate hand of the Almighty Creator of all things? for, if they ever had existed in the old world, it is hardly possible that they could have been totally exterminated from that quarter of the globe where they were first placed.

THE inferences to be drawn from the above facts and observations, are these:

That there is a general gradation from man through the animal race; from animals to vegetables, and through the whole vegetable system. By gradation, I mean the various degrees in the powers, faculties, and organization. The gradation from man to animals is not by one way; the person and actions descend to the orang-outang, but the voice to birds, as has been observed.

That there are many quadrupeds, insects, birds, and fishes, which appear to be created for particular climates, and cannot live in any other.

That many animals and vegetables exist in the old world, which were not found in the new one, when discovered by *Columbus*; and that there are many animals and vegetables found in the new world, which were never known in the old.

Lastly, that those animals which were common to both worlds, were only to be met with in the northern hemisphere, in which the new and old world had probably communications near the north pole. These animals were about twenty-six in number.

 PART SECOND.

ON THE GRADATION IN MAN.

I SHALL now endeavour to prove the general gradation in man, the chief and lord of the creation. The hint that suggested this investigation, was taken, as has been observed, from Mr. *John Hunter*, who had a number of skulls, which he placed upon a table in a regular series, first shewing the human skull, with its varieties, in the European, the Asiatic, the American, the African; then proceeding to the skull of a monkey, and so on to that of a dog; in order to demonstrate the gradation both in the skulls, and in the upper and lower jaws. On viewing this range, the steps were so exceedingly gradual and regular, that it could not be said that the first differed from the second more than the second from the third, and so on to the end*. Upon considering what Mr. *Hunter* thus demonstrated respecting skulls, it occurred to me that Nature would not employ gradation in one instance only, but would adopt it as a general principle. I had observed that the arms were longer, and the feet flatter

* See note 7.

in apes than in the human species; and, having the skeleton of a negro amongst others in my museum, I measured the radius and ulna, and found them nearly an inch longer than in the European skeleton of the same stature. The foot of the negro I perceived to be much flatter: the *os calcis* also differed from that of the European both in length, breadth, shape, and position, not forming an arch with the tarsal bones, but making with them nearly a straight horizontal line.—(A drawing of the foot of the negro skeleton may be seen in plate 1.)—These remarks encouraged me to proceed in my investigation. I did not carry my enquiries into provincial or national varieties or features, but confined them chiefly to the extremes of the human race: to the European, on the one hand, and, on the other, to the African, who seems to approach nearer to the brute creation than any other of the human species. I was persuaded, that if I could prove a specific distinction betwixt these two, the intermediate gradations would be more easily allowed.

I next examined the skull, and found the frontal and occipital bones narrower in the negro than in the European; the *foramen magnum* of the occipital bone situated more backward, and the occipital bone itself pointing upwards, and forming a more obtuse angle with the spine in the former, than in the latter. The internal capacity of the skull was less in the former; and the fore parts of the upper and lower jaw, where they meet, were considerably

more prominent. In the negro, the depth of the lower jaw, betwixt the teeth and the chin, was less; and that of the upper, betwixt the nose and the teeth, was greater: the distance from the back part of the *occiput* to the *meatus auditorius* was less, and from thence to the fore teeth was greater. The fore teeth were larger, not placed so perpendicularly in their sockets, and projecting more at their points than in Europeans: the angle of the lower jaw was nearer to a right angle, and the whole apparatus for mastication was stronger. The bones of the nose projected less. The chin, instead of projecting, receded. The *meatus auditorius* was wider. The bony sockets, which contained the eyes, were more capacious. The bones of the leg and thigh more gibbous: and, by the marks which were left upon the skull, it plainly appeared that the temporal muscles had been much larger.—In all these points it differed from the European, and approached to the ape.

I wish it to be particularly understood that I consider the chin of the negro as deserving peculiar attention. This part has either not been properly characterised, or the account has been much misunderstood. It is said by some that the chin of the negro projects: the reverse, however, is the fact; for, beside that the distance of the fore teeth from the bottom of the chin is less than in the European, the lower part of the chin, instead of projecting outward, retreats, or falls back, as in the ape.

In the annexed table are the measurements of nine European skeletons, of a negro skeleton, of Dr. *Tyson's* pigmy, and of a monkey, shewing the stature of each, the length of the *os humeri* and of the *ulna*. The skeletons are none of them selected; but are all that I have been able to find, in Manchester, that are complete in the bones only. The table likewise contains a comparative account of the same particulars in living subjects, whites and negroes, of which an explanation will follow.

SKELETONS.

	Mr. White's female European.		Mr. Ward's male ditto.		Mr. Wood's male ditto.		Mr. Naudin's male ditto.		Mr. Wood's 2d male ditto.		Mr. Longworth's female ditto.		Mr. Crolier's female ditto.		Mr. Foxley's male ditto.		Manchester Infirmary female ditto.		Mr. White's male negro.		Dr. Tyton's pigmy male.		Mr. White's monkey.	
	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.
Stature, Os humeri, Ulna,	5	8 $\frac{1}{2}$ 12 $\frac{1}{2}$ 10	5	8 13 9 $\frac{1}{2}$	5	7 12 $\frac{1}{2}$ 9 $\frac{1}{2}$	5	5 $\frac{1}{2}$ 13 10 $\frac{3}{4}$	5	5 12 $\frac{1}{2}$ 10	5	4 12 9 $\frac{1}{2}$	5	3 $\frac{1}{2}$ 12 $\frac{3}{4}$ 10	5	1 $\frac{3}{4}$ 12 $\frac{1}{2}$ 10 $\frac{1}{4}$	4	11 $\frac{1}{2}$ 11 9 $\frac{7}{8}$	1	9 5 $\frac{1}{2}$ 5 $\frac{1}{2}$	2	2 4 $\frac{1}{2}$ 5		
Living Negroes.																								
Stature, Upper arm, Fore arm,	5	10 $\frac{1}{2}$ 15 12 $\frac{3}{4}$ No femur.	5	8 13 12 $\frac{1}{2}$	5	8 13 $\frac{3}{4}$ 11 $\frac{3}{4}$	5	7 13 11 No femur.	5	6 12 $\frac{3}{4}$ 10 $\frac{3}{4}$	5	6 12 $\frac{3}{4}$ 10 $\frac{3}{4}$	5	6 12 $\frac{1}{4}$ 11	5	5 $\frac{1}{2}$ 13 $\frac{1}{2}$ 11 $\frac{3}{4}$	5	4 $\frac{1}{2}$ 12 $\frac{1}{2}$ 10 $\frac{1}{2}$	5	1 $\frac{1}{2}$ 13 11	5	0 12 10 $\frac{1}{2}$ No femur.		
White Europeans.																								
Stature, Upper arm, Fore arm,	5	11 $\frac{1}{2}$ 15 11	5	9 $\frac{1}{2}$ 14 11	5	8 13 $\frac{1}{2}$ 10 $\frac{1}{2}$	5	8 13 $\frac{1}{2}$ 10 $\frac{1}{2}$	5	7 $\frac{1}{2}$ 13 $\frac{1}{2}$ 10 $\frac{1}{2}$	5	7 $\frac{1}{2}$ 13 $\frac{1}{2}$ 10 $\frac{1}{2}$	5	7 $\frac{1}{4}$ 12 $\frac{3}{4}$ 10	5	7 12 $\frac{3}{4}$ 10	5	5 $\frac{1}{4}$ 13 $\frac{5}{8}$ 10 $\frac{1}{4}$	5	4 $\frac{1}{2}$ 12 $\frac{1}{2}$ 10 $\frac{1}{2}$	5	0 12 $\frac{1}{2}$ 9 $\frac{1}{2}$		

The following measurements were taken from three of the tallest foldiers in Captain HORTON's grenadier company of Royal Lancashire Volunteers.

GRENADIERS	Daniel Lees,		Robert Lees,		John Shepley,	
	F.	IN.	F.	IN.	F.	IN.
Stature,	6	$4\frac{1}{2}$	6	1	6	0
Upper arm,		16		$15\frac{1}{2}$		15
Fore arm,		$12\frac{1}{4}$		$11\frac{5}{8}$		$11\frac{3}{8}$
	John Harris,		Joseph Bamford,		James Peatfield,	
	F.	IN.	F.	IN.	F.	IN.
Stature,	6	$3\frac{1}{2}$	6	2	6	$2\frac{1}{4}$
Upper arm,		$15\frac{1}{4}$		$15\frac{1}{4}$		$15\frac{1}{4}$
Fore arm,		$11\frac{1}{4}$		$11\frac{1}{4}$		$11\frac{1}{2}$
	John Lee, (a Lascar)		A tawney woman,		Cast of the Jew at Somerset-house.	
	F.	IN.	F.	IN.	F.	IN.
Stature,	5	4	5	4	5	8
Upper arm,		$12\frac{3}{4}$		12		$14\frac{1}{2}$
Fore arm,		$10\frac{1}{2}$		$10\frac{1}{4}$		11
	Venus de Medicis,		European women,		European women,	
	F.	IN.	F.	IN.	F.	IN.
Stature,	5	0	5	4	5	0
Upper arm,		$13\frac{1}{2}$		13		$12\frac{1}{2}$
Fore arm,		$9\frac{3}{4}$		$9\frac{3}{4}$		$8\frac{1}{2}$

Lavater, speaking of the difference of skulls relatively to sexes and nations, says, ‘ the skull of a Dutchman is more
 ‘ rounded, in every sense; the bones of it are broader,—
 ‘ more uniform,—have fewer curves,—and, in general,
 ‘ have the form of an arch, less flattened at the sides.

‘ The skull of a Calmuck has an appearance much more
 ‘ rude and coarse; it is flattened at the top, prominent at
 ‘ the sides, and at the same time firm and compact: the
 ‘ face is broad and flat.

‘ That of the Ethiopian is erect and stiff, suddenly nar-
 ‘ rowed towards the top, sharpened above the eyes, pro-
 ‘ jecting below, elevated and globular in the hinder part.

‘ The forehead of the Calmuck is flat and low; that of
 ‘ the Ethiopian higher, and more sharpened: and in Eu-
 ‘ ropeans, the vault of the hind head is more arched and
 ‘ rounded, in form of a globe, than in the negro and the
 ‘ African in general.’

Lavater gives us a plate with engravings of skulls be-
 longing to the subjects of different nations.

‘ 1. That of a German. Every thing about it bears
 ‘ the impress of an European head, and it sensibly differs
 ‘ from the three which follow. The hinder part is thick-

er, the fore part more slender: the forehead, better
arched than the others, is neither too straight nor too
round.

2. Is the skull of an East Indian. It is easily distinguishable from the first: The crown of the head is more pointed, the hind head more shortened, the bones of the jaw and the whole face infinitely thicker.

3. That of the African differs from both of the preceding in the hind head, which is much narrower, and by the size of the bone which serves for its base: besides, the bone of the nose is too short, and the sockets of the teeth advance too much; hence that little flat nose, and those thick lips, which are natural to all the nations of Africa. I am particularly struck with the sensible disproportion between the forehead and the rest of the profile. That excepted, the arch of the forehead considered by itself, bears not that character of stupidity which is manifest in the other parts of the head.

4. The Nomade Tartar, or Calmuc. The forehead has a resemblance to that of the monkey, not by its situation, but by its flatness. The orbits of the eyes are very much sunk, and the bone of the nose so short, and so flat, that it scarcely projects beyond the adjoining bones. That of the chin is more pointed and promi-

‘ nent, but at the same time so small, that it produces, in
 ‘ the whole, an outline bending inward, the effect of which
 ‘ is very disagreeable.’

Again—*Lavater* says, ‘ It must have been already re-
 ‘ marked, that I take the system of the bones as the great
 ‘ outline of man, the skull as the principal part of that sys-
 ‘ tem, and that I consider what is added almost as the co-
 ‘ louring of this drawing; that I pay more attention to the
 ‘ form and arching of the skull, as far as I am acquainted
 ‘ with it, than all my predecessors; and that I have confi-
 ‘ dered this most firm, least changeable, and far best de-
 ‘ fined part of the human body, as the foundation of the
 ‘ science of Physiognomy.’

He asks, ‘ Which are in general the weakest animals, and
 ‘ the most remote from humanity? the most incapable of
 ‘ human ideas and sensations? Beyond all doubt, those
 ‘ which in their form least resemble man.’

Lavater frequently dwells upon the forehead, the nose,
 and the chin; which he conceives to be the three leading
 features. He asks, What care of education can arch the
 skull of a negro, like that of a star-conversant astronomer?

Speaking of the monkey, he says, ‘ Brutal inferiority to
 ‘ man is especially to be sought—in the shortness of the

‘ forehead, which is far from having the beautiful propor-
 ‘ tions of the human; and, accurately speaking, is no fore-
 ‘ head: a flat forehead is as great a solecism as it would
 ‘ be to say a horizontal perpendicular—in the nose, small
 ‘ above, flat below, and not prominent—in the descent
 ‘ from the nose to the mouth, which is nearly as long as
 ‘ the chin, or the part which corresponds to the chin;—
 ‘ whereas, in man, it has usually only half the length of
 ‘ the chin. The chin of man is more projecting; the
 ‘ chin of the monkey is so far back, that if a man’s skull
 ‘ and a monkey’s be placed upon a table, resting on the
 ‘ chin, the latter can scarcely be perceived to have any.’

He observes, ‘ I believe it may be received as a physi-
 ‘ onomical axiom, that the more chin the more man, so
 ‘ long as it bears a proportion to the nose: I speak not of
 ‘ fleshy, but bony chins. Hence, scarcely any beast viewed
 ‘ in front has chin. Hence the retreating chin and the
 ‘ retreating forehead generally accompany each other.—
 ‘ Particularly visible in profile is the form and size of the
 ‘ back of the head; how much more lengthened and de-
 ‘ pressed than that of man is the monkey’s! The angle
 ‘ formed by the back part of the under jaw and the line
 ‘ of the bottom of the head, is nearly a right one.’

Professor *Camper* says, ‘ From the moment in which I
 ‘ was in possession of the head of a negro and that of a

‘ Calmuck, I desired nothing so much as to compare these
 ‘ two heads with that of an European, and to unite with
 ‘ them the head of a monkey; the result of this comparison
 ‘ was a discovery, that a line drawn from the forehead to
 ‘ the upper lip would demonstrate the difference betwixt the
 ‘ faces of different nations, and likewise the resemblance
 ‘ betwixt the head of a negro and that of a monkey.—
 ‘ Taking with great care a sketch of each of these faces
 ‘ upon an horizontal line, I traced the facial lines, follow-
 ‘ ing the angles which they made with the line horizontal.
 ‘ As soon as I brought the line of the face forward, I had
 ‘ the head of an antique; if I inclined it backward, I had
 ‘ the head of a negro; a little farther back, it presented the
 ‘ head of a monkey; still farther, that of a dog; and lastly,
 ‘ that of a woodcock—and in this consists the basis of my
 ‘ edifice*.’

* The facial line of a monkey makes an angle of 42° , with the horizontal line; that of an orang-outang, 58° ; that of a negro, 70° ; of a Chinese, 75° ; of an European, 80 or 90° . The Roman painters preferred the angle of 95° ; the Grecian antique, 100° . If above 100° , it begins to grow monstrous, and with a greater angle the head must resemble that of a child labouring under a hydrocephalus.

So far, according to *Camper*.—But perhaps the angle made by the facial line may be estimated as follows: That of the European, from 90 to 80° ; of the Asiatic, from 80 to 75° ; (I have seen an Asiatic whose facial line appeared to me to be near 80°)—of the American, from 75 to 70° ; of the African negro, from 70 to 60° ; of the orang, from 60 to 50° ; of the common monkey, from 50 to 40° . It is less in the dog, and still more so in birds.—There is, therefore, a perfect and regular gradation in the inclination of the face, from the perpendicular line of the European man, to the horizontal one of the snipe or woodcock; in which last there is no room in the jaws for teeth.

But, to return to my own observations. After having compared my negro skeleton with the European, I was obliged to pursue the comparison with a great number of living subjects, before any fair induction could be obtained. Accordingly, I measured the arms of about fifty negroes;—men, women, and children, born in very different climates; and found the lower arm longer than in Europeans, in proportion to the upper arm and to the height of the body.—The preceding table contains the measures of the first twelve negroes I met with, and also of the first twelve Europeans, of nearly corresponding stature that I measured, beginning with those of my own family; so that no selection was made in either case for the purpose of serving an hypothesis. I took the following method to measure the fore arm. I applied a pair of callipers to the extremity of the elbow, and to the lower extremity of the *ulna*, where it is joined to the wrist; by which the length may be accurately obtained. But it is not so easy to find the length of the *os humeri* in a living subject. I contented myself with applying one end of the callipers to the extremity of the elbow, and the other end just below the *acromion*: the distance gave the length of the *os humeri*, together with the thickness of the *ulna*, at its upper part; but, as all were measured in the same manner, this circumstance is immaterial. By a careful admeasurement I found, that, not only in the twelve, but in *all* the negroes, the length of the lower arm was greater than in those of Europeans corresponding in

stature. I am informed, however, of a negro skeleton in St. *Bartholomew's* Hospital, in which the *radius* and *ulna* are no longer than the medium of Europeans: But as Africans, as well as Europeans, are liable to some variation in this particular, one or two exceptions have no force against the general inference.

Living subjects are always more to be depended upon than skeletons, for two reasons: first, the bones may be changed in preparing or in mounting them; and, secondly, the stature of the skeleton is entirely governed by the manner of putting together the bones of the spine.

The first negro on the list, is one in the Lunatic Hospital in Liverpool. His fore arm measures twelve inches and three quarters, and his stature is only five feet ten inches and a half. I have measured a great number of white people, from that size up to six feet four inches and a half; and, amongst them, one who was said to have the longest arms of any man in England; but none had a fore arm nearly equal to that of the black lunatic.

I measured the lunatic myself, in the presence of several gentlemen of the faculty, at the Hospital; but after my return from thence, finding the measure of the arm to exceed all others so much, I was afraid of a mistake; and wrote to a medical man of the Infirmary, desiring the lunatic might

be measured again. This was done; and two pupils at the Infirmary sent me a note, of which the following is a copy:

	F.	IN.
" Height of the BLACK at the Asylum,	5	$10\frac{1}{2}$
" Length of the <i>humerus</i> ,		15
" Length of the <i>ulna</i> ,		$12\frac{3}{4}$

" 11th April, 1794.

" RICH. FORSHAW,
" THO. CHRISTIAN."

I have measured the arms of a great number of European skeletons, and have found that the *os humeri*, or upper arm, exceeds in length the *ulna*, which is the longer bone of the fore arm, by two or three inches; in none by less than two, and in one by not less than three inches and one eighth. In my negro skeleton, the *os humeri* is only one inch and one eighth longer than the *ulna*. In Dr. Tyson's pigmy, the *os humeri* and *ulna* were of the same length; and in my skeleton of a common monkey, the *ulna* is three quarters of an inch longer than the *os humeri*: so that, in respect to the fore arm, the gradation is as regular as possible.

I next examined the feet of living blacks, of men, women, and children, born in Liverpool, and clothed and educated as the other natives of that town are; these I found to be flatter than in Europeans. There was a difference also in other particulars; the bones of their thighs and legs were gibbous on the fore part; their fingers and toes were longer and smaller, but the thumb appeared shorter and

smaller. Upon the whole, therefore, I think it cannot be doubted, that, from whatever cause it may arise, there actually subsists a characteristic difference in the bony system, betwixt the European and the African. This difference exists in the skull, in the sockets for the eyes, in the nose, in the chin, in both the upper and lower jaws, and in the position of the head upon the spine; also in the length of the fore arm, in the feet, and in the legs and thighs*.

Professor *Camper* was decidedly of opinion, that the whole human race descended from a single pair, and that all the varieties were occasioned by climate, nutrition, air, &c. ‘But (says he) how these operate, and why the upper *maxilla* of a negro and the cheek bones of a Calmuck project, and why the socket of the eye is lower and more oblique in a Chinese and a Moluccan, cannot be fully explained.’ But what would he have said, if he had known that the lower arm of the African was considerably longer than that of the European, though there seems to be no difference in the length of the upper arm, the leg, or the thigh? He very justly explodes the idea of the heads, noses, and jaws of negro children being modified by absurd customs of their parents. Some persons have supposed that the mouth, being exposed to the influence of climate more than some other parts, might be more luxuriant in hot

* Some differences in different subjects, relative to the number of the *vertebræ* of the loins, have been observed by anatomists. See Note 7.

countries; but we find mouths of the same form in the frigid zone. Besides, were the above supposition admitted, we should expect to find the nose and the chin enlarged for the same reason; whereas, the very reverse is the case, the nose being shorter, and the chin also shorter and less prominent. And if it should be alleged that the fore arm might be longer, from the same cause, why not the upper arm, the leg, and the thigh also?

Were we to look over the world at large, and take into consideration the numerous varieties which would be presented to us in respect to the bones, it would probably appear, that several tribes resembled the European, in many particulars, but that none of them united all his characteristics; the arched hind-head and fore-head, the prominent nose, the round projecting chin and flat mouth, the same facial line, and the short fore arm, being not known to exist together in any other quarter of the world. Whatever deviations from these are found to take place, they are generally in the line of gradation from the European man down to the ape.

Having endeavoured to establish and illustrate the fact of a gradation from the European man to the brute, in respect to the bones, being that part of the system allowed to be least affected by climate, diet, customs, &c. we will now proceed to shew that a similar gradation takes place in the cartilages, muscles, tendons, skin, hair, sweat, catamenia, rank

smell and heat of the body, duration of life, testes, scrotum, and *frænum præputii*, *clitoris*, *nymphæ* and *mammæ*, size of the brain, reason, speech and language, sense of feeling, parturition, diseases, and manner of walking; and likewise that a gradation takes place in the senses of hearing, seeing, and smelling; in memory, and the powers of mastication: but in these last particulars the order is changed, the European being the lowest, the African higher, and the brute creation still higher in the scale.

With regard to the cartilages, muscles, and tendons, we are not in possession of a sufficient number of comparative anatomical facts to allow us to state much. The cartilage of the nose in the negro is much broader than in the European, and still broader in the ape. The *gastrocnemii* muscles are smaller, and placed higher in the African than in the European; they are still smaller and higher in the orang-outang: in the monkey those muscles are totally wanting. The temporal muscles are larger in the African than in the European, and still larger in apes. The *tendo achillis* is longer in the African than in the European, and still longer in the ape.

The SKIN, including the *epidermis* and *rete mucosum*, is well known to be thicker in the African than in the Europeans, and still thicker in monkeys.

The HAIR of the head, chin, &c. is shorter and more woolly in the African than in the European, and still more so in monkeys.

The SWEAT.—Captains and Surgeons of Guinea ships, and the West India planters, unanimously concur in their accounts, that negroes sweat much less than Europeans; a drop of sweat being scarcely ever seen upon them. Simiæ sweat still less, and dogs not at all. As to insensible perspiration, I do not know how the fact stands; probably it is less in negroes, owing to the thickness of their skins: and the consequence may be a greater exhalation of moisture from the lungs.

CATAMENIA.—It is the general opinion of physiologists, that females menstruate in larger quantities in warm climates than in cold; twenty-four ounces being the quantity in the warmest climates, eighteen ounces in Greece, from ten to four in this country, and two ounces in the coldest, as Lapland. This may be true in Europeans, and in Creoles born of European parents, but I believe it is much otherwise in negresses.—Dr. *Spaarman*, the Swedish naturalist, who went to make discoveries in Africa, informs us, that those periods are much less troublesome to the female sex in Africa than in Europe. The fact has been confirmed to me by the testimony of many Planters, as well as of Captains and Surgeons of Guinea ships, who have had the fullest opportuni-

ties for observation. Apes and baboons menstruate less than negresses, monkeys still less, and sapajous and sagouins not at all.

The RANK SMELL emitted from the bodies of many negroes is well known; but it is much stronger in some tribes or nations than in others, and the strongest in apes.

HEAT.—This may be considered in two points of view; the capability of persons sustaining a warm or cold climate, and the natural temperatures of their bodies as indicated by a thermometer. As to the first, Dr. *Spaarman*, speaking of the Africans, says—‘ Though they did not appear of a chilly nature, they never shewed the least signs of being displeased with the hottest days of summer.’ West India planters have assured me, and all writers agree, that the negroes in the West Indies suffer more from the cold and moist weather, than from the warm and dry: cold renders them languid and dispirited, but heat revivifies them.— Their infants are so sensible of the impressions of cold air, that they are obliged to be kept for the first nine days after birth in close warm chambers. If this precaution be neglected, they are liable to be affected with the *tetanus*, or locked jaw, which generally proves fatal to them. It is allowed that the creole negroes sustain the extremes of heat much better than the creole whites. On the other hand, when the blacks are transported into these colder climates,

they seem to suffer more than we do from cold. I myself have known instances where negroes have lost their toes by the frost, in circumstances wherein an European would not have suffered. Consistently with this, we find that the whole genus of simia is impatient of cold; and no orang-outang has ever yet been able to bear the cold of many European winters — With regard to heat, in the second point of view, it has been said that negroes are two degrees colder than Europeans. The practice of the luxurious Turk gives countenance to this, as he prefers a negress for summer, a fair Circassian for spring and autumn, and an European brunette for winter.

DURATION OF LIFE.—Negroes are shorter lived than Europeans. All observations confirm the fact, that the children of negroes are more early and forward in walking than those of Europeans; likewise that they arrive at maturity sooner. The males are often ripe for marriage at ten, and the females at eight years of age. Now, it is a general principle in natural history, that the more early any species of animals arrive at maturity, the shorter is the natural period of their life.

Citius pubescunt, citius senescunt.

In conformity with this principle, we find that negroes rarely attain to the longevity of Europeans. Lieutenant *Patterson*, in his account of the *Caffres*, mentions one of ninety years

as a very rare phenomenon. Most other travellers concur in observing, that negroes and Hottentots of fifty are reckoned very old men; and that at forty they become wrinkled, and discover every other mark of old age, notwithstanding they may have vigorous constitutions, and be free from disease. In this respect, therefore, gradation is apparent; for, according to *Linnaeus*, the orang-outang lives only twenty-five years.

That the PENIS of an African is larger than that of an European, has, I believe, been shewn in every anatomical school in London. Preparations of them are preserved in most anatomical museums; and I have one in mine. I have examined several living negroes, and found it invariably to be the case. A Surgeon of reputation informs me, that about forty years ago, when he was pupil to the late *William Bromfeild*, Esq. he assisted at the dissection of a negro, whose penis was *ad longitudinem pollicum duodecim*. It was preserved and deposited in Mr. *Bromfeild*'s museum. *Haller*, in his *primæ Linæ*, speaking of the Africans, says, '*In hominibus etiam penis est longior & multo laxior*;' but I say, *Multo firmior & durior*. In *simiæ* the penis is still longer, in proportion to the size of their bodies.

I found with some surprise, that, the TESTES and SCROTUM are less in the African than in the European. They are still less, proportionally, in the ape. That the

penis should be larger, and the *testes* and *scrotum* smaller, in the order thus stated is another remarkable instance of gradation.

FRAENUM PRAEPUTII.—I have examined twelve negroes, who had not been circumcised, but had the *praeputium* complete and large, and in four of them there was no *fraenum praeputii*, nor the least preparation for one, nor any sign of their ever having had any; there was no appearance of ulceration or incision having taken place; and, upon the strictest enquiry, I could not find that any such thing had happened*. Six of them had very trifling ones, which hardly could be called bridles: the remaining two were as perfect as Europeans.

CLITORIS and NYMPHAE.—Dr. *Spaarman*, speaking of the then prevalent opinion that the Hottentot women have a kind of natural veil which covers the sexual parts, says, ‘The women have no parts uncommon to the rest of the sex; but the *clitoris* and *nymphae*, particularly of those who are past their youth, are much elongated.’ This has been confirmed to me by several surgeons of Guinea-ships; and, from the observations upon the *penis* given

* I had since an opportunity of examining only one of the sons of these four, (Thomas Rogers’s—see the preceding table) and he had no *fraenum praeputii*.—This boy was only four years old: a convincing proof that the *fraenum* was not destroyed by any venereal complaint.

above, analogy seems to require it. Notwithstanding this, it may be observed, that in the four or five instances I had occasion to examine, there was no material difference from Europeans discoverable.—In the females of the ape and the dog, the *clitoris* is still longer.

MAMMAE.—We are informed by Drs. *Thunberg* and *Spaarman*, that the Hottentot women have long flabby breasts; and that they can suckle their children upon their backs, by throwing the breast over their shoulders. *Monf. Buffon* says the same of the women of Greenland; and further, ‘ that their nipples are as black as jet, and their skin
‘ of a deep olive colour; and it is said that some of them
‘ are as black as the Ethiopian.’ Long flabby breasts, therefore, are not the effect of relaxation in a warm climate, but are found with people of colour in the frigid as well as torrid zone. No European white woman, however, in any age or climate, was ever known to have a breast of such description. The African, therefore, in this particular approaches to the simia.—*Long*, in his History of Jamaica, says, ‘ Negresses have larger nipples than Europeans.’——Brutes have still larger nipples.

SIZE OF THE BRAIN. REASON.—The cavity of the skull, which contains both *cerebrum* and *cerebellum*, is less capacious in the African than in the European, and still less in the brute species. All the nations of Africa, and the inha-

bitants of the southern isles have either very narrow skulls, the two parietal bones approaching near to each other; or they have a flat, receding forehead, and hind-head: and the bony sockets which contain the eyes, are more capacious than those of Europeans. It has been observed already, that man has the largest brain of any animal; and, of all men, the European has the largest; yet some animals possess a larger brain in proportion to their body; as mice, squirrels, &c. and some birds.

We know so little of the physiology of the brain and nerves, that I shall not state much concerning them.—It should seem, however, from the observations made upon man, the elephant, and other creatures, that, generally speaking, those animals which have a greater quantity of brain, have also more reason, or sagacity. Mr. *John Hunter*, who, it must be allowed, was as capable as any man of examining the *interior* of the elephant's head, and who had opportunities of dissecting no fewer than three elephants that belonged to the Queen, preserved and arranged the brains of different animals, upon which his editor remarks: ‘ In the insect the brain has a more compact form, --- is
‘ larger in fish, --- but still more so in birds, --- gradually
‘ advancing in size, as the animal is endowed with a
‘ greater degree of sagacity, till at last it becomes the large
‘ complex organ found in the elephant and in the human
‘ subject.’—On the other hand, *Lavater*, who seems to

have been equally attentive in examining the *exterior* of the elephant's head, when speaking of that animal, discovers ' his retentive memory in the size and arching of his forehead, which approaches nearer to the outline of the human forehead than that of any other beast.' *Vol. 2. page 174.*

Again — ' Superior to all is distinguished the elephant, by an increase of skull, alike in the back part and in the forehead. How true, how natural an expression of wisdom, power, and delicacy!' *Page 159.*

It has been customary to distinguish, by the name of *instinct*, the ruling principle in animals, from *reason* in man: but it is much more probable that *instinct* and *reason* are only different degrees of the same principle. It can scarcely be denied, that " man differs more from man, than man from beast." — Whether it proceeds from a difference in the quantity of brain, or from any other source, there seems a difference in the original capacity of the different tribes of mankind. We shall state the opinions of two or three intelligent observers on this head.

Dr. *Thunberg* says, ' It may indeed be alleged, that the inhabitants of the warmer climates have a dull torpid brain, and are less keen and sharp than the Europeans. They have a power of thinking, but not profoundly, and con-

‘ frequently conversation among them is rather trifling. —
 ‘ They are, in general, idle, sleepy, heavy, and lascivious.
 ‘ To these qualities, the heat of the climate itself inclines
 ‘ them; and, without insulting the dark brown inhabitants
 ‘ of the East Indies, one may truly say that there is a greater
 ‘ difference between them and the Europeans, than between
 ‘ the monkeys and them.’

Mr. *Jefferson*, speaking of the negroes, says, ‘ Comparing
 ‘ them by their faculties of memory, reason, and imagination,
 ‘ it appears to me, that in memory they are equal to
 ‘ the whites, in reason much inferior, as I think one could
 ‘ scarcely be found capable of tracing and comprehending
 ‘ the investigations of Euclid; and that in imagination they
 ‘ are dull, tasteless, and anomalous.’ Indeed it may be
 reckoned unfair to compare the capacity of Africans with
 that of Europeans, who have been so long civilized; but it
 cannot be reckoned so in comparing them to the American
 Indians. Mr. *Jefferson* continues — “Many millions of
 ‘ them have been brought to and born in America; most
 ‘ of them indeed have been confined to tillage, to their
 ‘ own homes, and their own society; yet many of them
 ‘ have been so situated, that they might have availed them-
 ‘ selves of the conversation of their masters; many have
 ‘ been brought up to the handicraft arts, and from that
 ‘ circumstance have always been associated with the whites.
 ‘ Some have been liberally educated, and all have lived in

‘ countries where the arts and sciences are cultivated to a
 ‘ considerable degree, and have had samples of the best
 ‘ works from abroad. The Indians, with no advantages of
 ‘ this kind, will often carve figures on their pipes, not def-
 ‘ titute of design and merit. They will crayon out an ani-
 ‘ mal, a plant, or a country, so as to prove the existence
 ‘ of a germ in their minds, which only wants cultivation.
 ‘ They astonish you with strokes of the most sublime ora-
 ‘ tory, such as prove their reason and sentiment strong,
 ‘ their imagination glowing and elevated; but never yet
 ‘ could I find, that a black had uttered a thought above the
 ‘ level of a plain narration, never see even an elementary
 ‘ trait of painting and sculpture.’ — *Notes on the State of*
Virginia, page 232.

SPEECH and LANGUAGE. — Dr. *Thunberg* says, ‘ The
 ‘ language, which frequently is almost the only thing that
 ‘ distinguishes the indolent Hottentots from the brute crea-
 ‘ tion, is poor, unlike any other in the world, is pronounced
 ‘ with a clack of the tongue, and is never written.’ *Gamon*
 says, ‘ The sound of their voice resembles fighting.’ *Spits-*
bergh says, ‘ that their language resembles the clucking of a
 ‘ turkey.’

In whatever respect the African differs from the European,
 the particularity brings him nearer to the ape. The **LIPS**,
 however, form an exception to this rule; and would have

been a considerable infringement on the order of gradation, if the ape had been possessed of the faculty of speech. But as it is, the chasm betwixt the African and the ape, relative to speech, is so great, that we need not wonder at a change in the organization. With respect to this point, it may be remarked, that since the mouth of the African protrudes more; since the distance is of course greater from the throat to the teeth, and all the appendages of the mouth, except the chin, are larger than in Europeans; it was perhaps necessary to have the lips larger, in order to strengthen or modulate the voice in speaking or singing. It is further observable, that such Europeans as have concave mouths, or are denominated in-mouthed, have all thin lips; and in such the distance from the wind-pipe to the teeth is of course less than in those who are out-mouthed. Now it is found, that in wind instruments, both the length of the tube and the form of its extremity, have an effect upon the sound: the longer the tube, the deeper will be the note; and the more divergent its extremity, the louder will be the sound. Out-mouthed people seem then to require thick divergent lips, in order to give force and energy to their utterance. All the other parts subservient to speech, and those subservient to mastication, being larger in the negro than in the European, the distance of the teeth from the larynx being also greater, the tongue larger, the teeth stronger, and the nose broader, it should seem that proportion required the

lips to be thicker, in order to give the best effect to the voice and articulation.

As an account of the manner in which the human voice and speech is effected, is not to be met with everywhere, and as it bears a near relation to the present subject, it may not be improper to subjoin a few observations on that head.

The larynx is the organ by which the voice is formed; but without the assistance of the parts above it (as the throat, palate, uvula, mouth, teeth, tongue, nose, lips, &c.) we should not be able to form articulate sounds, which are necessary for the communication of our ideas. When we have a mind to speak, we draw in our breath, and, in expiring it, contract the vocal chords till they vibrate, and afford such a sound as we choose; this is modified by the tongue, lips, &c. so as to form determinate sounds or words. The letters of the alphabet, which may be considered as elementary sounds, are divided into different classes, denominated *gutturals*, *linguals*, *dentals*, *labials*, and *nasals*, according to the organ most particularly concerned in their pronunciation.—Thus, *a* and *o* are gutturals; *b* and *p*, labials; *c* and *s*, dentals; *l* and *r*, linguals; and *m* and *n*, nasals. Hence, as every letter and word requires a peculiar distinct action, disposition, and configuration of these organs, which are visible if nicely and accurately attended to, curious persons have availed themselves of this circumstance to teach deaf and

dumb people to understand what is said to them, and even to speak intelligibly.

The manner in which the larynx acts is but little known, though various opinions have been given concerning it.—Some of the best modern physiologists are of opinion that the voice is formed by the air upon its egress, forcibly impinging on the sides of the rimula, and exciting a tremulous motion, as in wind instruments. Others have imagined, with less probability, that it is produced after the manner of the sound of musical chords, bells, &c. where the percussion of some other body besides air, excites the vibratory motion in the strings, &c. which is communicated to the air. Others, again, have imagined the organs of speech to comprehend the powers of both wind and string instruments. All the notes of music result from the variety in the length, thickness, and tension of musical chords. Thus, the shorter, smaller, and more tense any chord is, the more acute is the sound, because the vibrations are quicker; on the contrary, the longer, thicker, and laxer the string, the slower is the vibration, and the graver the note. In the human voice, when an acute sharp note is to be sounded, the chords are stretched, made smaller, and more tense, by the *crico-thyroidaei* and *crico-arytenoidaei postici* muscles, and the rimula is at the same time constricted. On the contrary, for a deep base note, the rimula is pretty open, and the chords are laxer and thicker, and the vibration slower, as then the rimula is in a great measure left to itself.

SENSE OF FEELING.—The cuticle, including *reticulum*, is much thicker and harder in black people than in white ones, the *reticulum* in the latter being a thin mucus, in the former a thick membrane. Wherever the cuticle is thicker, the *corpus reticulare* is thicker also, as appears by the feet of negroes. The office of the *rete mucosum* is to keep the *papillae*, which are the immediate organs of touch, moist; and both together serve to defend them from injury: the thicker, therefore, those integuments are, the duller must be the sense of touch. It is no wonder then, that negroes have not that lively and delicate sense of touch that the whites have, since both the cuticle and *rete mucosum* are thicker in them.—In brutes this sense is still duller than in negroes.

PARTURITION.—There exist many differences in the human species, which have been attributed to relaxation, from heat; but which do not, in fact, proceed from that cause. We have had frequent accounts of the very easy parturitions of the natives of Africa, the West Indies, America, and the southern parts of Asia, by *Brookes*, *Bruce*, *Waser*, *Dampier*, *Neuhoff*, *Woods*, *Rogers*, *Pittavillians*, and *Long*. These writers inform us, that the women have very easy labours, and that they retire to the woods, bring forth alone, and return directly home,—after washing themselves and their children in the sea, or in a river. Such easy labours have been generally attributed to relaxation, from the warmth of the climate: but *Hen-*

repius says, ‘ The wives of the Livonian peasants and the
 ‘ savages of North America use the same custom. The
 ‘ women retire to some private place when the time of
 ‘ their delivery is at hand, and return immediately after to
 ‘ their work.’ As the same thing happens both in warm
 and cold climates, we cannot attribute it to relaxation from
 heat. It must, therefore, either be occasioned by the in-
 fants of people of colour having smaller heads, or the mo-
 thers having large and capacious pelvises, or from their liv-
 ing nearly in a state of nature, or, perhaps, from all these
 three causes. Mr. *Soemering* says, the *pelvis* of the male
 negro is smaller than that of the European; but he does not
 say what is the size in the female. Several surgeons of
 Guinea-ships have informed me, that, in general, the ne-
 gresses have larger hips and more capacious *pelvises* than
 European women; and, as the heads of adult negroes are
 smaller than those of the Europeans, we may suppose that
 the heads of their infants are also smaller. Something,
 likewise, may be attributed to their living in a state of na-
 ture; for it has been observed by Dr. *Bland**, ‘ that those
 ‘ cows that are kept in London upon gross and improper
 ‘ food, with little exercise, have more frequently difficult
 ‘ labours, and suffer more in consequence of parturition than
 ‘ those that live in the country, under less restraint, and in
 ‘ a manner more adapted to their nature.’ But whatever

* Observations on Human and Comparative Parturition, page 40.

may be the cause or causes, the fact seems to be, that women of colour have easier parturitions, in general, than white Europeans; and that brutes have easier parturitions than the human species.

DISEASES. LOCKED JAW.—This is a complaint with which various species of the animal kingdom are afflicted: it does not, however, equally prevail amongst all those species. It attacks the human European, sometimes in their own climes; but more frequently, and more fatally, in the torrid zone. Medical observers state, that negroes are much more liable to it, and that it is more fatal to them, even in the torrid zone, than to Europeans. It is still more frequent among quadrupeds, and more fatal to some of them, particularly horses, than to negroes. I have often seen this disease, both in the human species and in horses; but where one of the human species suffers with it in this kingdom, I may safely say, that ten or twenty horses are affected by it. I have known it arise from docking, and nicking their tails; from cropping, or setting their ears; also, after castration, and many other operations; from gathering a nail in the foot; and, frequently, when no visible cause could be discovered.

Dr. *Benjamin Mosely*, in his treatise on Tropical Diseases, says, ‘ I have lost many patients in the locked jaw, after amputations; and never found that leaving out the nerves, or whether ligatures were made or not, caused the smallest

‘ difference in the event, nor were any security against the
 ‘ locked jaw, nor diminished the symptomatic fever.

‘ How far the sensibility of the nerves, or the irritability
 ‘ of the muscles, are concerned in the tetanus; or how the
 ‘ muscles should act in sympathy without the nerves appear-
 ‘ ing to be any way affected, is, I believe, in as much ob-
 ‘ scurity as GALEN’s *principalis animæ vis*.

‘ The locked jaw appears to be a disease entirely of irri-
 ‘ tability. Negroes, who are most subject to it, whatever
 ‘ the cause may be, are void of sensibility to a surprising de-
 ‘ gree. They are not subject to nervous diseases. They
 ‘ sleep sound in every disease, nor does any mental disturb-
 ‘ ance ever keep them awake. They bear surgical ope-
 ‘ rations much better than white people; and what would be
 ‘ the cause of insupportable pain to a white man, a negro
 ‘ would almost disregard. I have amputated the legs of
 ‘ many negroes, who have held the upper part of the limb
 ‘ themselves.—Susceptibility of the tetanus, whether original
 ‘ or symptomatic, does not depend on age or sex, neither
 ‘ is it confined to the human species:—every species of
 ‘ animal is subject to it: I have seen many horses die of it.
 ‘ It arises in animals from many of the same causes that
 ‘ produce it in human beings.

‘ Negro children are chiefly the victims of this disease in
 ‘ the West Indies. — The cause of the tetanus among chil-

' dren in the West Indies is generally attributed either to the
 ' intemperance of the mother during pregnancy, or to the
 ' irritation of the navel after birth, or to the smoke* of the
 ' lying-in room, or to the dampness of its situation, or to
 ' the carelessly letting in cold air upon the child. Some
 ' people even attribute it to the wickedness of the mother,
 ' to avoid the trouble of bringing up the child. The ne-
 ' groes often charge it to the malice of OBED, or witch-
 ' craft. Speculators have searched for other causes in the
 ' most remote corners of nature. That negroes, who never
 ' see this accident happen to white children, nor any others
 ' who have proper care taken of them, if born healthy,
 ' should attribute it to witchcraft, is very natural; but that
 ' physicians should be ignorant of the cause, and that the
 ' effects should so often be permitted to happen, is extraor-
 ' dinary and unnatural.'

Dr. *John Hunter*, in his *Observations on the Diseases of the Army in Jamaica*, page 305, says, 'The diseases of the negroes fell seldom under my observation; what I have to say of them, therefore, will be very short, and chiefly with a view of calling the attention of others to the subject; for we are hitherto much in the dark respecting several disorders, that are in a great measure confined to

* Dr. *Clark* is decidedly of opinion, that the *irismus nascentium*, or jaw-fall of infants, is occasioned by the smoke of wood fires in the negroes huts:—where no fires have been made, he has never known the disorder to occur.

‘ the negroes in that part of the world. A better history
 ‘ of them would enlarge our knowledge of pathology, and
 ‘ teach us, I doubt not, many new and interesting facts in
 ‘ the animal œconomy.’

European women, in hot countries, are very subject to floodings, and to the *fluor albus*. Negresses are almost exempt from both these complaints; but are very liable to obstructions of the *menfes*. *Gonorrhœa simplex* is a very common complaint among the negro men, when there is not the least suspicion of any venereal taint.

That the Indians of America are subject to fatal diseases, which do not affect white people, we have a convincing proof in the 54th volume of the Philosophical Transactions, p. 386*. It is there related, that in 1763, in the island of Nantucket, there were three hundred and fifty-eight Indians, when a sickness broke out, which, in about six months, seized two hundred and fifty-eight of them; of whom only thirty-six recovered. Of the hundred that escaped, thirty-four were with the sick, eight separate, eighteen at sea, and forty in English families. It was particularly remarkable, that although the English inhabitants were much more numerous,

* “ An Account of an extraordinary Disease among the Indians of Nantucket
 “ and Martha’s Vineyard, in New England: in a Letter from *Andrew Oliver*,
 “ Esq. Secretary of His Majesty’s Province of Massachusetts Bay, to *Israel*
 “ *Mauduit*, Esq. F.R.S.”

not *one* of them had the sickness; but that some persons, half Dutch and half Indian; and one, half negro and half Indian, had it, and recovered. The distemper, about the same time, broke out at Martha's Vineyard, and was attended with similar circumstances.

Dr. *John Hunter* says, ‘ The *Cacabey* is a negro name
 ‘ for a disease not known among Europeans or their de-
 ‘ cendants, as far as I could learn. It begins in whitish
 ‘ spots upon the skin, near the ends of the extremities. —
 ‘ Those spots turn to ulcers, commonly upon the fingers and
 ‘ toes; there is much swelling and pain, and the joint af-
 ‘ flicted drops off without any mortification. The sore af-
 ‘ terwards heals up, and remains well even for months, but
 ‘ returns again, affects the next joint, which, after a time,
 ‘ drops off; and the disease, attacking one joint after ano-
 ‘ ther, in the end reduces the miserable sufferer to a mere
 ‘ trunk. It continues often several years before it proves
 ‘ fatal.’——He likewise mentions dirt-eating as a disorder
 peculiar to negroes, and which frequently proves fatal to
 them.——On the other hand, speaking of the expedition
 against Fort St. *Juan*, he observes, that few or none of the
 soldiers survived; they being taken off by fevers, from which
 the negroes, who accompanied them, were almost wholly
 exempt. From this circumstance he takes occasion to recom-
 mend, that a company of negroes should be attached to each

regiment, to perform any hard labour that might be required in the heat of the day.

We have equally authentic accounts, of negroes being wholly, or in great part, exempt from some diseases, which prove very fatal to white people. That accurate observer, Dr. *Lining*, speaking of the yellow fever which prevailed in South Carolina, says, ‘ There is something very singular in
‘ the constitution of the negroes, which renders them not
‘ liable to this fever; for, though many of them were as
‘ much exposed as the nurses to this infection, yet I never
‘ knew an instance of this fever amongst them, though they
‘ are equally subject with the white people to the bilious
‘ fever*.’

Mr. *Matthew Carey*, however, in his short account of the malignant fever at Philadelphia†, after relating the above, observes; — ‘ The same idea prevailed for a
‘ considerable time in Philadelphia, but it was errone-
‘ ous. They did not escape the disorder: however, the
‘ number of them that were seized with it was not great;
‘ but, as I am informed by an eminent doctor, it yielded
‘ to the power of medicine in them more easily than in the
‘ whites.’

* *Essays and Observations*, vol. 2, page 407.

† Page 78.

With respect to the yellow fever which prevailed in the West Indies in former years, and particularly that which, during the last summer, took off many of our soldiers, sailors, and officers, and likewise many of the white inhabitants, I have made diligent enquiry of several officers and other well-informed people, but do not find that any of the negroes caught the disease, though many of them attended the sick, and were employed in burying the dead.

These remarks upon diseases seem to prove, that there are original differences in the constitutions of the white Europeans, the negroes, and the Indians.

Mr. *Long* takes notice of a fact, which seems to have escaped the observation of naturalists:—that the lice which infest the bodies of negroes are blacker, and generally larger, than those which are found on white people*.

The African's MANNER OF WALKING is very different from that of the European's, and very much resembles that

* Perhaps this apparently trivial circumstance may be deemed no inconsiderable argument in support of the opinion that Africans are a different race from Europeans. It is known to naturalists, that the different species of animals and plants nourish various insects, many of which are supported upon one or a few species. Rarely, if ever, is it found that the same plant or animal, modified by any peculiarity in the soil, situation, &c. is refused by the insect on that account: yet, I have been informed by negroes born in North America, who had never been in a hot climate, that their lice were of a black colour, and larger than those common to Europeans; and that those which infest the Europeans seem to refuse the negroes.

of the ape. This, no doubt, proceeds from the bones of the leg and thigh being gibbous, from the flatness of the feet, from the height of the calves of the legs, and from the smallness of the gastrocnemii muscles. These circumstances, together with the forward position of the head upon the spine, oblige them, when they walk, to put themselves into such an attitude as will best preserve their balance.

We have now shewn that there exist material differences in the organization and constitution of various tribes of the human species; and not only so, but that those differences, generally, mark a regular gradation, from the white European down through the human species to the brute creation. From which it appears, that in those particulars wherein mankind excel brutes, the European excels the African.

It remains yet to notice, that in those particular respects in which the brutes excel mankind, the African excels the European: these are chiefly the senses of SEEING,—HEARING,—and SMELLING;—the faculty of MEMORY,—and the power of MASTICATION.

SEEING.—Professor *Pallas* informs us, that ‘ Nothing
 ‘ is more astonishing than the acuteness of *sight* in most of
 ‘ the Calmucks, and the extraordinary distance at which
 ‘ they perceive very minute objects, such as the dust raised
 ‘ by cattle or horses, and this from places very little ele-
 ‘ vated.’

Soemmering informs, us that ‘ the olfactory and optic nerves, and those of the 5th pair, are uncommonly large in the African.’ Neither Calmucks nor negroes, however, can be compared with hawks, eagles, and some other birds, in acuteness of vision.

HEARING.—The *meatus auditorius* is wider in the Negro than in the European. The external ears of Negroes are, notwithstanding, in general, small and round, and have no lobes. This is the case with many monkeys: but the Calmucks have very large ears, which stand out considerably from the head; and the ears of Dr. *Tyson*’s pigmy were constructed in the same manner. There seem, therefore, to be two different approaches to the brute species in the construction of the external ear.—Professor *Pallas* says, the Calmucks hear, at a great distance, the trampling of horses, the noise of an enemy, of a flock of sheep, or even of strayed cattle: they have only to stretch themselves on the ground, and to apply their ear close to the turf.—Certain quadrupeds, as hares, horses, asses, and such others as can erect their large ears, are still more perfect in hearing than the Calmucks.

SMELLING.—It is observable that negroes have wider nostrils than Europeans. *Pallas* informs us, that the nose of a Calmuck is of a structure quite singular, being, generally, flat and broken towards the forehead. They find

the subtilty of the sense of smell very useful in their military expeditions; for by it they perceive, at a distance, the smoke of a fire, or the smell of a camp. There are many of them who can tell, by applying the nose to the hole of a fox, or of any other quadruped, whether the animal be in or not. But dogs possess this sense in the greatest perfection.

It is said that negroes excel Europeans in **MEMORY**; but those domestic animals with which we are best acquainted, as the horse and the dog, excel the human species in this faculty.

Negroes have stronger powers of **MASTICATION** than Europeans: and most quadrupeds have them still stronger.

As to the senses in general, so far as relates to the human species, custom and exercise seem to have a considerable effect in improving them; but are not, it may be presumed, sufficient to account for the differences that actually exist*.

* The reader will find a large extract from a treatise entitled "On the Corporal Difference of the Negro and European," by *S. T. Soemmering*, M. D. Professor of Anatomy at Mainz, &c. &c. 1785. 8vo. The original is printed in the German language: and *Dr. Holme*, Physician to the Manchester Infirmary, has done me the favour to translate the extract into English. It contains some important observations of that celebrated anatomist, on the organs of the senses, the bony system, &c. in Negroes; and likewise on the brain and nerves.

It will not be amiss here to exhibit, in one point of view, the conclusions deducible from the facts and observations stated in the second part of this essay.

1. There are material differences in the corporeal organization of various classes of mankind.

2. Taking the European man as a standard of comparison, on the one hand, and the tribe of simiæ on the other; and, comparing the classes of mankind with the standards, and with each other, they may be so arranged as to form a pretty regular gradation, in respect to the differences in the bodily structure and economy, the European standing at the head, as being farthest removed from the brute creation.

3. That the African, more especially in those particulars in which he differs from the European, approaches to the ape.

4. That the following characteristics which distinguish the African from the European, are the same, differing only in degree, which distinguish the ape from the European:

IN THE BONY SYSTEM,

The narrow and retreating forehead and hind-head.

The flat bone of the nose.

The great distance betwixt the nose and mouth.

The small retreating chin.

The facial line.

The great distance betwixt the ear and the fore part of the mouth.

The small distance between the *foramen magnum* and the back of the head.

The long and strong under jaw.

The large bony sockets which contain the eyes, and the wide *meatus auditorius*.

The long fore arm.

The flat foot; and the length, breadth, shape, and position of the *os calcis*.

IN OTHER PARTS OF THE SYSTEM,

The broad and flat cartilage of the nose.

The small *gastracnemii*, and large temporal muscles.

The long *tendo achillis*.

The thick skin, and short woolly hair.

The small brain.

The long breasts of the females.

The parts of generation.

The paucity of different discharges.

The rank smell.

Their manner of walking.

The power of adaptation to a warm climate.

Their shorter period of life.

5. That different classes of men are not liable to all the diseases incident to mankind, and that they are infested with different insects.

6. That, in comparing the classes of mankind with each other, and with the brute creation, as in the second article, there is a gradation also discoverable in the senses of *seeing*, *hearing*, and *smelling*, in *memory*, and in the powers of *mastication*, but in a contrary order to that above stated, the European being least perfect, the African more so, and the brutes most perfect of all, in these particulars.

 PART THIRD.

ON HAIR.

HAIR is scattered over the whole surface of the human body, except on the inside of the hands and the soles of the feet. In most parts it is soft and short, and grows only out of the skin; but upon the head, eye-brows, eye-lids, arm-pits, and pubes, and upon the chin in man, also upon the tails and manes of some animals, it arises from a bulbous root, more or less oval, which is membranous, vascular and sensible, and seated in the cellular substance beneath the skin; and in these situations it grows long. The covering of the root, filled with a pulp, passes out in a cylindrical figure, through a pore or opening of the skin, to the cuticle, which is extended along with it, so as to form a capsula to the hair itself, which, by this means, is rendered permanent and incorruptible. Beyond the surface of the cuticle, the covering of the hair is not demonstrable, though the spongy and cellular matter is continued through the whole length of the hair. These hairs with bulbous roots grow continually, and are re-

newed again, after being cut; which is said to be by a protrusion of their medullary substance, from the skin outwards, under a production of the cuticle. It is likewise said, that when the hairs are destitute of this *medulla* (as in old people) they dry up, split, and fall off, and become semi-transparent, or, as it is commonly called, white or grey. So far is certain, that in old people, or in premature old age, the hair is frequently deprived of its colouring matter, from some cause or other: and this likewise will happen from local premature old age; as some persons first have the symptoms of old age in one part, others in another part. This will also happen from disease, from accidents, and in all climates. It generally takes place earlier in Negroes than in Europeans, which is most probably owing to the former being shorter lived than the latter. The branching of the hair is visible enough at the extremity, with a microscope; and it is said to be apt to split, if suffered to grow long, or if kept too dry*. It is certain, that, long after death, when all the other parts and humours are putrified and corrupted, the hair will vegetate and increase; which it appears to do, as long as any moisture remains in the part.—The beard in man and in the goat, and the mane in the lion, distinguish the male from the female.

* I have some doubts of this fact; for, upon viewing some hair with a microscope, it appeared to me to throw out side-shoots, like vegetables.

The hair does not seem to have engaged so much of the attention of naturalists as it deserves. That which serves for a covering to the body of animals, and is properly called their *coat*, has usually been confounded with that which serves for ornament on the head, and with that which arises, at puberty, on the chin and other places, in the human species. Hence it has been argued, that negroes have shorter hair than Europeans—because that hair which constitutes the coat of animals, is shorter in hot climates than in cold ones. This argument, however, being founded on erroneous principles, is of no force. For, though the hair, in general, may not improperly be said to be of a vegetable nature, yet there is an essential difference between the hairs which form the coat of an animal, and those which grow upon the head, chin, &c. of the human species: not only do they take root differently, as has been observed already,—but another circumstance is particularly deserving of notice: The former is an *annual*—the latter, a *perennial*. The coat of animals, which seems designed by nature as a protection from cold, is much longer in cold climates than in warm ones. It grows faster in winter than in summer; and before the cold season is over, changes colour, even to whiteness, in very cold climates: at the expiration of the year, it dies away, falls off, and is succeeded by a fresh crop for the ensuing year.—On the other hand, that which grows on the head, chin, &c. of the human species, having a deeper root than the former, grows for a series of years;

and, in European whites, it attains a greater length in *warm* climates than in *cold* ones. Agreeably with this remark, it will be found to grow both longer and thicker in Greece, Italy, and Turkey, than in France; in France, more so than in England; and in England, more so than in the more northern parts of Europe*. We also find that artificial warmth increases its growth. In France, where they are desirous of having a great quantity of long hair, they sleep with much covering on their heads, and use much powder and pomatum, which defend it from the cold: these means seldom fail of producing the desired effect. Excess of heat is said to be prejudicial to the growth of hair; but this does not appear to be the fact: for negroes, in the burning sands of Africa, have hair as long, or longer, than the natives about the Cape of Good Hope, in the temperate zone,—whose hair, notwithstanding they use much grease, is so short and woolly, as to be compared to the nap upon cloth.—One author says, that the woolly hair of the negro, born in northern climates, will grow longer and less curled than in the torrid zone; but do we not daily see instances of negroes, born in North America, and in England, whose hair is as short, curled and woolly, as it is in the native Africans? Barbers and hair-dressers observe, that the beard and hair of the head grow one-third more in summer than in winter.

* The hairs upon the breast and legs of Europeans, grow much longer and faster under the torrid zone than in a temperate climate. Negroes, it is observable, have no hair upon their breasts or legs.

—It seems that women, in general, have longer hair than men; particularly those inclined to corpulency.

The natural curl of the hair cannot be owing to the warmth of the climate, as has been asserted by some authors; for, there are more among the Europeans who have curled hair, than among the natives of South America, whose hair indeed is usually straight and lank. Neither can it be owing to the state of society, nor to the want of civilization, that negroes have short, curled, woolly hair*; for Europeans, in like situations, have it not. We do not find that the ancient Gauls and Britons had their hair materially different eighteen hundred years ago, from what it is at present. *Julius Cæsar* observes of the latter, that ‘they wear the hair of their heads very long, but shave all the rest of their bodies, except the upper-lip.’ *Strabo* says, that the Gauls let their hair grow long; and that the hair of the Britons is not so yellow as that of the Gauls. Yet all historians agree in representing these people nearly as rude in their manners, civil polity, and religion, as it is possible for any people to be at this day.

In some parts of Scotland and Ireland, the inhabitants live in rude and smoky huts, with hardly any of the com-

* *Long* says, “The Creole negroes dread rain upon their bare heads as much as the native Africans: perhaps their woolly fleece would absorb it in large quantity, and give them cold.” All animals that are covered with wool, seem to suffer more in rainy, wet seasons, than those animals that are covered with hair.

forts of civil life; nevertheless the hair of these people grows as long, and their beard as full, as in those who are placed in the highest rank of civilization.

The inhabitants of the Malabar coast, in the East Indies, are as black as those upon the African coast; but they have long hair. I have lately seen one, whose name is *John Lee*, a Lascar, from Anjengo, situated in the torrid zone, in north lat. 7° , whose skin is as black as that of the generality of negroes; but his hair is long; his nose not flat, nor broad; his lips not thick; and his mouth not projecting. I am informed by a gentleman who has been on the coast of Malabar, that some of the inhabitants are as black as jet.— This is, therefore, a striking proof that the colour of the skin, the nature of the hair, and the form of the body, do not depend upon the same cause.

The long ornamental hair of the head, beard, &c. in the human species, exhibits a gradation in the same line as the other marks of distinction. The European has the longest hair; next to him the Asiatic; then the American; and, lastly, the African. Even the natives of Africa manifest various degrees* in this respect; nor does it appear that the shortest hairs and the deepest coloured skins always accompany each other. I have seen many negroes, of a jet black,

* See note 8.

whose hair might have been drawn out three or four inches long, and have formed a short *queue*; and I have seen others, of a yellowish complexion, whose hair was no longer than the frize or nap upon cloth. These last, in respect to their persons and their intellects, appeared to me to be the lowest in the scale of humanity, and much to resemble the Hottentots described by Dr. *Thunberg*.

Dr. *Sparmann*, who speaks more favourably of the Hottentots than most authors, says — ‘ The hair of the head is black and frizzled, though not very close; and has so much the appearance of wool, that it would be taken for it, were it not for its harshness. They have but seldom any appearance of beard, or hair upon other parts of their bodies, such as are seen upon Europeans; and when any thing of this kind happens to be visible, it is always very trifling, and generally of the same kind as that on the head.’ — We have particular instances of the hair on the head growing in large quantities, and to a very great length in Europeans, especially in the warmer climates. — An Italian lady was shewn at *Astley’s* Theatre in London, in the year 1792, whose hair was so long that it trailed on the ground when she stood upright. — *Gemelli Careri* remarks, ‘ that the Greek women, especially in the neighbourhood of Constantinople, have extremely fine hair; but that those whose hair descends to their heels, are less regular in their features.’ — Lady *Wortley Montague*, in her letters from

Turkey, speaking of the Turkish women, makes frequent mention of the very great quantity and length of their fine hair, which reaches to their heels;—of their white skins,—black eyes,—and most beautiful complexions. Many of the Chinese have long hair, hanging to the ground. There is at this time in London, from Canton in China, a man whose hair reaches to the ground when he stands upright, though he is a person of stature. Canton is in the torrid zone, in north lat. $23\frac{1}{2}$ degrees.

Notwithstanding the hair of the head, in general, grows longer in warm climates than in cold ones, there are instances of its growing to a great length in a temperate climate. In one instance, that of a Prussian soldier, the hair was so long as to trail upon the ground. I have myself seen an English woman, the wife of a theatrical gentleman, whose hair is six feet in length, and weighs upwards of three pounds, without that part which is nearly connected with the head: its colour is of a light brown.—The lady's stature is about five feet five inches, and she is rather inclined to corpulency.

The fine, long, flowing hair appears to be given for ornament. The Universal Parent has bestowed it upon but few animals, and those of the noblest kind:—upon man, the chief of the creation—upon the majestic lion, the king of

the forest—and upon that most beautiful and useful domestic animal, the horse.

It is presumed, that from what has been already said, it will be fully understood, how much the varieties in the growth of the hair of the head, depends on the climate. But as the wool of sheep has a near affinity to hair, and as it has been said by some to be materially altered by climate, it may be necessary to make this also a subject of our enquiry.

Buffon asserts, that our sheep, when transplanted into warm countries, such as Guinea, lose their wool, and become covered with hair. The same circumstance is related in the '*Report of the Directors of the Sierra Leona Company*,' lately published; and *Dr. Pallas* says, that extremes of heat and cold, alike tend to render the fleece coarse and hairy:—And he quotes a fact, upon the authority of *Demanert*, that there are two kinds of sheep in Guinea; one of which carries wool; and the other, a thin coat of hair only, resembling goats hair.

The same seems to be the case in India*. *Dr. Wright*, however, who lived many years in Jamaica, speaking† of the opinion that the wool of sheep becomes more hairy in

* Vid. the Second Appendix to *Dr. Anderson's* "Account of the different Kinds of Sheep," &c. † *Ibid.* page 133.

warm climates, says, that in the West India islands, it is true, there is to be found a breed of sheep, the origin of which he has not been able to trace, that carry very thin fleeces of a coarse shaggy kind of wool; which circumstance, he thinks, may naturally have given rise to the report. But he never observed a sheep that had been brought from England that ever carried wool of the same sort with those native sheep: on the contrary, though he has known them live there several years, these English sheep carried the same kind of close burly fleece that is common in England; and, in as far as he could observe, it was equally free from hairs.

In order to determine the true state of the case, and to ascertain the differences betwixt the hair of animals and the wool of sheep, Dr. *Anderson* has made a considerable number of experiments and observations.—After taking notice, that although the wool of sheep and the hair of animals are alike annual productions, the Doctor observes, that they differ in the following particular—the former is shed all at once, and leaves the animal bare; whilst the latter falls off more gradually, by which the old and new hairs become blended together. He then remarks an important difference between wool and hair: that the latter is generally of an uniform thickness, throughout its whole length; or, if there be any difference, it is, that it is smallest at the point;—whereas, the former is always variable, in the thickness of

its filament, throughout its whole length; and, in general, is considerably thicker towards the points than towards the roots—these facts clearly shewing that wool grows by having the part next the root protruded, and not by a prolongation of the extremity; and that the thickest part of the fibre grows in summer, and the smallest in winter. This latter conclusion was confirmed by a variety of experiments, all of which proved that the growing part of the fibre varies in thickness with the temperature of the season; being thickest in summer, smaller in spring and autumn, and smallest of all in winter. From this it may, perhaps, be fairly inferred, that wool must be coarser in a warm climate, and finer in a cold one, within certain degrees:—a fact by no means generally understood.

So far, then, is the opinion from being just, that the short, curled, woolly hair of the negroes is owing to climate, that, if we allow an affinity between the growth of wool and that of hair, and assume that the varieties of the latter depend entirely on climate, we might expect to find the hair of negroes as long, and thicker, than that of Europeans. In dogs, we find, that climate has not much effect; for different kinds have retained their peculiar coats, for centuries past, in the same climate.

Perennial hair, annual hair, and wool, seem to be three distinct productions, essentially different from each other,---

Of the perennial hair, there are various species; as that upon the head of an European; that upon the chin, and on other parts of the body. The hair of the negro's head seems to be a different species from the European hair, and not a variety occasioned by any difference of climate, or from any peculiar mode of living, dependent on their want of civilization.

 PART FOURTH.

ON THE COLOUR OR COMPLEXION OF MAN.

THE great diversity of complexion amongst mankind, being a circumstance so obvious and striking, has generally been considered as the principal and most characteristic distinction of the varieties, as they are called, of the human race.

Various are the opinions which have been entertained by the ablest naturalists, concerning the primitive cause of difference in the colour of man: it has usually been attributed chiefly to climate: the extreme of heat, and likewise of cold, being supposed to produce the black colour. But, this being found insufficient, some have added to it the state of society; comprehending under this head, the effects of diet, clothing, lodging, manners, habits, &c. all which, it has been argued with much ingenuity, are competent to produce the effect. Others have conjectured, with the late ingenious Dr. *Nicholls*, that diversity of colour might be given

to man, and to various tribes of animals, by the provident Creator, as a safeguard from their enemies. The Doctor imagined that the blackness of the Ethiopian tended to confirm this opinion; for, as the extreme heat to which he is subjected confines him under cover all the day, this dark colour would conceal them from the numerous ravenous beasts which infest those parts, when he was to fetch in his necessaries and provisions in the night-time.

The late Mr. *John Hunter*, I am informed, was of opinion, that the human species were originally black; because many black animals will breed white ones accidentally, but no white ones breed black ones. He said, the original breed of turkeys from the continent of Europe, and those from the continent of America, though very different birds, were all black. Black rats and mice will, sometimes, breed white ones; so will black crows, black-birds, and sparrows. White African negroes have been born of black parents, and so have pye-balled, or blotched black and white children. Both of these have been brought to England, and shewn as curiosities. They had all the shape and appearance of ordinary negroes, except the colour; which was more of a dead white than the European. But no black children, he said, were ever the produce of European parents.

Leaving it for those who maintain that people of all colours descended from one common stock, to investigate what may be the remote cause of difference in colour, we shall now attempt to shew, that an adequate cause has never yet been assigned. It is universally allowed, that the proximate cause is the colour of the *rete mucosum*; that the *epidermis*, cuticle or scarf-skin, including the *rete mucosum*, or *reticulum*, is thicker in the negro than in the European; and that in all the human race it is thinnest in the face, and thickest where there is greatest pressure, as in the soles of the feet, &c.

Albinus, in his '*Dissertatio secunda de sede & causa coloris Æthiopum & ceterorum hominum*', informs us, that the *reticulum* is of a deeper colour on the under side, where it joins the true skin, than it is on the upper side, where it is joined to the scarf-skin. His words are, '*Reticuli color, ad quem redeo, saturatior est, qua id cuti proximum; ab altera parte, qua epidermi conjunctum, jam aliquantum extinctus. Itaque intelligi potest, qui fiat ut extrinsecus Æthiops tam fuscus non sit quam est pars intima reticuli sui.*' And Mr. *Cruikshank*, in a letter to Mr. *Clare* in his remarks on the skin and its pores, says, 'When a blister has been applied to the skin of a Negro, if it has not been very stimulating, in twelve hours after a thin transparent greyish membrane is raised, under which we find a fluid. This membrane is the cuticle or

‘ scarf-skin. When this, with the fluid, is removed, the
 ‘ surface which was under them appears black; but if the
 ‘ blister had been stimulating, another membrane in which
 ‘ this colour resides, would also have been raised with the
 ‘ cuticle; this is the *rete mucosum*, which is itself double,
 ‘ consisting of another very transparent membrane, and of
 ‘ a black web, very much resembling the *nigrum pigmen-*
 ‘ *tum* of the eye. When this membrane is removed, the
 ‘ surface of the true skin (as has hitherto been believed)
 ‘ comes in view, and is white, like that of an European.
 ‘ The *rete mucosum* gives the colour to the skin; is black
 ‘ in the Negro; white, brown, or yellowish, in the Euro-
 ‘ pean.’

Mr. *Cruikshank* has done me the favour to send me an elegant drawing of a preparation which he had made, to demonstrate the outward integuments of a Negro, just as taken out of spirits.

That the upper layer of the *rete mucosum* is lighter than the lower, must therefore be admitted; and this circumstance may be adduced as a clear proof, that the colour is not owing to the heat of the sun; since, if that were the case, the upper layer would certainly be of a deeper colour than the lower, being more exposed to the action of the sun's rays. Great stress, however, has been laid upon the circumstance, that those parts which are most exposed to the sun are black-

est, as the face; and that those which are the least exposed are the palest; such as the soles of the feet, palms of the hands, under the chin, the lower part of the belly, under the arms where they lie to the side, and between the fingers: but the real cause, which is pressure, seems to have been overlooked. Wherever there is pressure, the cuticle grows thicker and paler; and that in proportion to the degree of pressure. The skin of the face is thinner and blacker, probably because there is no pressure upon it; so is the nipple and the areola, and the verge of the anus, in both sexes. The *scrotum* likewise is blacker, which certainly cannot be owing to exposure to the sun.

I have been informed, by gentlemen of undoubted veracity, that in the East Indies there is a species of domestic fowls, the bones of which, when the *periosteum* is stript off, are jet black. Whatever plausibility may have been in the opinion, that the skin is rendered black by a hot climate, surely the *bones* cannot be affected in like manner.

It has been asserted, that negroes of a jet black are mostly confined to the barren burning sands of Africa, within the torrid zone. Dr. *Patterson*, however, describes the Caffres, a people inhabiting the country to the north-east of the Cape of Good Hope, as far down as 31° of south latitude, as being from five feet ten inches to six feet high, and of a jet black, having their eyes large, and their teeth as

white as ivory, &c. He describes the country as being very fertile, and well watered; but adds, ‘ so far is the climate
 ‘ from being excessively hot, that the frosts are often found
 ‘ prejudicial to the corn.’

All those naturalists who contend that the colour of the human species is caused by climate, advance, that there cannot be a more striking instance of this than in the Jews. ‘ These people’ they say, ‘ are scattered over the face of
 ‘ the whole earth. They have preserved themselves distinct from the rest of the world by their religion; and as
 ‘ they never marry any but their own sect, so they have
 ‘ no mixture of blood in their veins, that they should differ from each other; yet nothing is more true than that
 ‘ the English Jew is white, the Portuguese swarthy, the
 ‘ American olive, the Arabian copper, and the African
 ‘ black: in short, that there appear to be as many different species of Jews as there are countries in which they
 ‘ reside.’ Now granting them the fact as to colour, the premises are by no means just; for the Jews have gained proselytes in every part of the world where they have resided, and they are at liberty to marry those proselytes. But the truth is, that the Jews are generally swarthy in every climate*.

* ‘ In the suburbs of Cochin, a town in Malabar, there is a colony of industrious Jews, of the same complexion they have in Europe. They pretend they

Analogous to the Jews, in this point of view, are the Gypsies: a numerous swarm of banditti spread over the face of the earth. They wander about Asia, and the interior parts of Africa; and, like locusts, have over-run most of the European nations. Constantly refusing to participate of civilized society, they keep themselves secluded from the rest of mankind. Their singular physiognomy and manners are the same in every age and country. Their swarthy complexion in the temperate climes of Europe, undergoes no change when exposed to the burning sun of Africa.

Spain is supposed to contain forty thousand, or upwards, of these vagrants. They abound in Italy. They are scattered through Germany, Denmark, Sweden, and Rus-

‘ were established there during the captivity of Babylon: it is certain they have
‘ been many ages in that country.’

Sketches of the History of Man, vol. i. p. 29.

Dr. Camper says, ‘ there is no nation so distinguishable as the Jews. Men;
‘ women, and children, from their births bear the characteristic marks of their
‘ race. Mr. West, the distinguished painter, with whom I have frequently dis-
‘ coursed on the subject, confessing my inability to discover in what this national
‘ mark consists, places it chiefly in the crooked form of the nose. I acknowledge
‘ that this contributes much, and that it gives them a resemblance to the Lascars,
‘ of whom I have seen numbers in London, and have even taken the model of a
‘ face in Paris plaster. But there is still a somewhat unexplained.’

sia. It is supposed Europe contains more than seven hundred thousand of them*.

The discovery of America exhibited a people scattered over an immense continent which embraces both the torrid and temperate zones, of an uniform red copper-colour, and with long straight hair, except near the northern extremity of the country, where they were of a very deep brown colour, inclining to black; and are supposed to have travelled thither, over land or ice, from the northern parts of Europe. No stronger proof than this seems required, that the colour of the skin is not the effect of climate. But it is said that America is not so hot as Africa, and that therefore it does not produce negroes. Why then does it not produce white people, similar in complexion to Europeans, since some part of it must correspond to Europe in its mean temperature? Yet no white people were found there at first, nor have any of the red copper-coloured complexion been found on the other continent.

The Rev. Dr. *Sam. Stanhope Smith*, of Philadelphia, one of the latest and ablest writers who attribute the colour of the human race to climate, &c. in his *Essay on the Causes and Variety of Complexion in the Human Species*, says, ‘ From

* A circumstantial account of this vagrant race, has lately been written in German by *H. W. G. Grellman*, and translated by Mr. *Raper*.

‘ the Baltic to the Mediterranean you trace the different
 ‘ latitudes by various shades of colour. From the same, or
 ‘ from nearly resembling nations, are derived the fair Ger-
 ‘ man, the dark Frenchman, the swarthy Spaniard and Si-
 ‘ cilian,’ &c. All those national characteristics I deny.
 The children of the Frenchman, the Spaniard, and the Si-
 cilian, are as far removed from the African, in colour,
 form, and in the nature of their hair, as are those of the
 German or of the Englishman: the colour of adults is as
 good also, in those parts that are covered with clothes:
 neither can the colour of their faces and hands be distin-
 guished from that of Englishmen, when they have resided
 a winter or two in England, and gradually lost the tan
 which they had received from the heat of the sun in
 their native climate.

Dr. *Smith* further says, ‘ Another example of the power
 ‘ of climate, more immediately subject to our own view,
 ‘ may be shewn in the inhabitants of the United States.
 ‘ Sprung within a few years from the British, the German,
 ‘ and the Irish nations, who are the fairest people in Eu-
 ‘ rope, they are now spread over the continent from the
 ‘ 31° to the 45° of northern latitude. And notwith-
 ‘ standing the temperature of the climate, notwithstanding
 ‘ the shortness of the period since their first establishment in
 ‘ America, notwithstanding the continual mixture of Eu-
 ‘ ropeans with those born in the country—notwithstanding

' previous ideas of beauty, that prompted them to guard
 ' against the influence of the climate—and notwithstanding
 ' ing the high state of civilization in which they took pos-
 ' session of their new habitation, they have already suf-
 ' fered a visible change. A certain countenance of pale-
 ' ness and a softness strikes a traveller from Britain, the
 ' moment he arrives upon our shore. A degree of fallow-
 ' ness is visible to him, which through familiarity, or the
 ' want of a general standard of comparison, hardly at-
 ' tracts our observation. This effect is more obvious in the
 ' middle, and still more in the southern, than in the
 ' northern states,' &c. Taking all this for granted, can
 any other fair inference be drawn from it, than that the
 climate, for which nature never designed them, did not
 agree with them? and that they had lost that appearance of
 strong health and vigour which they had enjoyed in their
 native country? Certainly nothing is here advanced to prove
 the least approach to the red Indian, the original native of
 America. It is not uncommon for a certain countenance
 of paleness and softness to appear in any person, and in any
 climate, whether he be a white European or a black Afri-
 can, when he is much debilitated, or in a bad state of
 health, however produced. In white Europeans, such a
 state is more especially attended with a degree of fallow-
 ness if there be any obstruction in the biliary ducts. Since
 these effects are more observable in the middle, and still more
 in the southern than in the northern states, we have a

clear proof that the warm climates disagreed with the settlers more than the temperate ones. The facts, therefore, do not support Dr. *Smith's* doctrine, but rather contradict it.

‘ The poor and labouring part of the community,’ continues Dr. *Smith*, ‘ are usually more swarthy and squalid in their complexion, more hard in their features, and more coarse and ill formed in their limbs than persons of better fortune and more liberal means of subsistence. They want the delicate tints of colour, the pleasing regularity of feature, and the elegance and fine proportion of person.’

I doubt the validity of this remark: Are we not deceived by external appearances resulting from dress, want of cleanliness, exposure to the weather, neglect of person, and awkwardness in gait? It is surprising what difference takes place in a couple of months, when any poor fellows who answer the description which the Doctor has here given, enlist into his Majesty's service, and are made clean and neat; when, their hair being dressed and powdered, they are put under the care of a drill serjeant. What can exceed the forms of the persons, or the colour of the skins, of our common soldiers, though taken from the lowest class of people! Look at the regiment of *Blues*, many of whom were raised in the least civilized parts of Lancashire; or

the *Greys*, a regiment composed of men in the lowest order of society in Scotland; or even examine many of the Irish regiments, filled by men who have been taken from the most wretched situations in which poverty could place men, and say whether the metropolis, the central point of civilization, or the richest and noblest families in the kingdom, can produce handsomer, or better complexioned men?

It has been advanced by some, that when the black inhabitants of Africa are transplanted to colder, or the white inhabitants of Europe to warmer climates, their children born there are of a different colour from themselves; that is, lighter in the first, and darker in the second instance.

This opinion I am very much inclined to question, and must call upon its advocates to support it by facts. They must prove what I am persuaded will be found very difficult, or rather impossible; that the alteration from black to white, and the contrary, is general; and they must further prove, that the people in question have never intermarried with any but those of their own colour; and that their wives have been faithful: all this too for five or six generations; for in less time than this it is not even pretended that any material alteration is produced.

It will be much easier to prove the negative of this opinion. From innumerable instances, it is known that Euro-

peans have emigrated to the torrid zone, and that their descendants have resided there for five or six generations, always preserving the same shape and colour, and the same kind of hair, as other Europeans.

Mr. *Long*, in his History of Jamaica, affirms, ‘ That the
 ‘ children born in England have not, in general, lovelier,
 ‘ or more transparent skins, than the offspring of white pa-
 ‘ rents in Jamaica. In the southern parts of the island they
 ‘ have none of that *vermicelli* so much admired in England;
 ‘ but, though exposed, as lively children necessarily must
 ‘ be, very much to the influence of sun-shine, their skins
 ‘ do not acquire the English tan, but in general grow pale,
 ‘ and a fainter white.’

At the time of the grand rebellion, one hundred and forty years ago, many families went from England to Jamaica; whose descendants are in the predicament above-mentioned.

It is certain that the descendants of negroes in North America, where no intermixture of European blood has taken place, retain their peculiar characteristics; the same form of body, the same black colour of the skin, and the same short woolly hair as their originals: for this we need only appeal to any one who has had opportunity to see such negroes. It seems, therefore, sufficiently evident, that the

contrary opinion has originated under the influence of an hypothesis.

Don *Carlos de Gimbernat* (the son of Don *Antonio Gimbernat*, first surgeon to the King of Spain) a young Spanish gentleman well versed in natural history, who had lived much at the court of Madrid, assured me on good authority, that many Spanish families had resided in South America for five or six generations, and, by never intermarrying with any of the natives, had retained their original colour, being as white as any Europeans. — This gentleman had resided in Great Britain eighteen months, and was of as good a colour as any Englishman, though the Spaniards are generally reckoned swarthy; but this colour always wears off when they have resided some time in a more northern climate, and was at first merely the effect of being tanned, or sun-burnt; for their children are as white as other Europeans.

Mr. *de Maret*, who has lately published an excellent history of Africa, conjectures that the complete change from white to perfect black, might have taken place at the end of three centuries, or in fifteen generations, twenty years being allowed to each generation. But how is this possible, when a hundred and forty years residence in Pennsylvania has produced no sensible change? Supposing that a trifling change of colour is apparent in some individuals, who will

assure us, that they have no European blood in their veins?

It is said that the extreme of cold is productive of a tawny complexion, as well as heat; and that in consequence, the natives of the frigid zone are brown, and those who live farthest north almost entirely black. Hence it is imagined that the polar and equatorial regions are alike unfavourable to the human figure and complexion. The Laplanders, the Esquimaux Indians, the Samoied Tartars, the inhabitants of Nova Zembla, the Borandians, the Greenlanders, and the natives of Kamtschatka, partake more or less of this supposed effect of cold; but the Finlanders and Norwegians, who reside in climates of nearly the same severity, are fair beyond other Europeans, as has been observed by Lord *Kaimes* *. He likewise says, ‘The Moors
‘ in Hindostan retain their natural colour, though transplant-
‘ ed there more than three centuries ago. And the Mo-
‘ gul family continue white, like their ancestors the Tar-
‘ tars, though they have reigned in Hindostan above four
‘ centuries.—The southern Chinese are white, though in
‘ the neighbourhood of the torrid zone; and women of
‘ fashion in the island Otaheite, who cover themselves from
‘ the sun, have the European complexion.’

* Sketches, &c. vol. i. page 28.

The dark colour of the skin, in some particular parts of the body, is not confined to either the torrid or frigid zones: for in England the nipple, the *areola* round the nipple, the *pudenda*, and the verge of the *anus*, are of a dark brown, and sometimes as black as in the Samoied women. It is to be remarked, that the colour of these parts grows darker in women at the full period of gestation.

One morning I examined the breasts of twenty women in the lying-in hospital in Manchester, and found that nineteen of them had dark coloured nipples; some of them might be said to be black, and the *areola* round the nipple, from one inch to two inches and a half in diameter, was of the same colour. They were all either in the last month of pregnancy, or not discharged from their confinement.

That colour is not occasioned by habits of living, or by the state of society, we need no better proof than that the Gauls and the Britons were in as savage a state, when invaded by the Romans, as the nations of Africa and America are now; and yet they were of the same colour as their descendants at this day.

If the black colour of the skin were the effect of a warm climate, we might expect to find in other animals inha-

biting the torrid zone, and even in the vegetable creation, some traces of its influence; for

‘ The universal cause

‘ Acts not by partial, but by general laws.’

Nothing, however, is more certain, than that the various tribes of quadrupeds, birds, insects, and reptiles in the torrid zone, manifest as great a variety of colour as in any other part of the earth; and that in the temperate zones we find at least an equal proportion of black animals. As to vegetables, nothing can exceed the richness and brilliancy of colour they display everywhere in the tropical regions.

We are informed that the children of negroes, when first born, are of the same ruddy colour as European children; but that the *scrotum* and the *glans penis* are black; and that they have a black or brown thread or circle on the extremity of the nails. The reason why all children, both of blacks and whites, and of every intermediate shade, are all born of a ruddy colour, is owing to the cuticle and *rete mucosum* being so exceedingly thin and transparent: the latter not having yet acquired any colour, shews through it the colour of the *cutis vera*, or true skin, which is an integument very full of blood vessels, and therefore nearly of the colour of blood itself. The cuticle and *rete mucosum* grow gradually thicker and less transparent; and

in negroes the latter grows gradually darker coloured and harder; but the former preserves its transparency in the face through life; which is evinced, in white people, by the redness of the cheeks, and by blushing; and in negroes by the superior blackness of the face, the dark *rete mucosum* appearing more clearly through it there than in any other part.

I had an opportunity of seeing a mulatto infant last winter, the offspring of a white woman by a negro. The mother was a home-patient of the lying-in hospital, and her house was the residence of darkness and poverty. The skin of the child, on the day of its birth, had that ruddy appearance already mentioned; but notwithstanding the circumstances of cold and darkness, it soon began to alter, and approach to the mulatto colour.

We shall here subjoin a table of the mixtures of black and white people; shewing the different degrees of colour, which it is said are sufficiently recognisable, and the names that have been appropriated to each.

<i>Offspring of a</i>	<i>Is denominated</i>	<i>Degree of Mixture.</i>
White and Black	A Mulatto	$\frac{1}{2}$ White and $\frac{1}{2}$ Black.
White and Mulatto	A Quadroon or Quarteron	$\frac{3}{4}$ White and $\frac{1}{4}$ Black.
Black and Mulatto	A Samboe or Quarteron	$\frac{3}{4}$ Black and $\frac{1}{4}$ White.
White and Quadroon	A Mestize or Quinteron	$\frac{7}{8}$ White and $\frac{1}{8}$ Black.
Black and Samboe	A Quinteron	$\frac{7}{8}$ Black and $\frac{1}{8}$ White.
White and Mestize	A (reputed) White *	$\frac{15}{16}$ White and $\frac{1}{16}$ Black.
Black and Quinteron	A (reputed) Black	$\frac{15}{16}$ Black and $\frac{1}{16}$ White.

These distinctions are made in the West Indies, and on the continent of America. Dr. *Thunberg* observes that similar changes take place at the Cape of Good Hope; the offspring of a white and mestize being quite white. In the succeeding generations their offspring continues quite white, or quite black, provided the marriages have been in that line; but without this intermixture of blood, it has never been ascertained that blacks have a tendency to become white, or whites to become black, in any part of the earth.

Many accidents may indeed happen, by which the colour of the skin may be altered in a man or in brutes, as

* These are white by law, and consequently free in our West India islands. They are not distinguishable from pure whites in complexion, features, or hair.—There is at this time a gentleman well known in the first circles in London, who was born in Jamaica, and descended from a white and mestize; but he is not to be distinguished from an European by any particular. I have seen several of this description myself.

by inflammation, ulceration, or by wounds. If a negro, resident in Guinea, is wounded, and the wound heal, the skin will sometimes be white for a short time, or even for life: in this case, it is easy to imagine the *rete mucosum* may be destroyed, so as not to admit of a regeneration. The skin of an European may, in like circumstances, become black, and continue so in perpetuity, especially after a wound or ulcer of the leg. This I have frequently seen, both when the cure has been performed in a hot and in a cold climate.—Horses, whose backs have been injured by the saddle, have frequently white spots upon them—and artificial stars are often made on their foreheads. In both these cases, I imagine the *rete mucosum* is destroyed, so as not to be regenerated; or that the vessels are so altered, as to refuse admittance to the colouring matter.

That discolouration of the skin, called tanning, or being sun-burnt, and those spots called freckles, are most incident to the fairest skins, and soon wear off, if the parts be covered or kept from the sun: these affections, no doubt, belong to the scarf skin only, or they would not so soon disappear. Marks with gunpowder go no deeper than the scarf skin; for, if that come off, they are no longer seen, as I have frequently observed.

EXTRAORDINARY INSTANCES OF COLOUR.

Notwithstanding it must be from general, rather than particular and accidental cases of colour in the human skin, that the question concerning its origin must be decided; yet, as irregularities may tend to illustrate the subject, the peculiarities of the *Albinos* become, in this place, proper subjects of investigation.

I. ALBINOS.

Albinos constitute a variety of the human race, and are variously denominated in different parts of the globe.—These people are to be met with in Asia, in Africa, in America, and even in Europe; and are denominated *Albinos*, or white people, from their being totally destitute of that usual colouring matter which shews itself in the skin of negroes, &c. and in the hair, the *uvea*, and *iris* of other people. Monf. *Buzzi* thinks they want the *uvea* both behind the *iris* and under the *retina*, and the *rete mucosum* in every part of the body. They cannot see so well as other people in sun-shine, or splendid light, by reason, as is supposed, that the absence of the *uvea*, or of the black *mucus*, admits light too copiously into the eye. The co-

lour of their complexion, too, is not the same as that which is natural to Europeans, but is a dead or milk white.— Their person, features, and hair are similar to those of their parents, the difference existing only in their colour; and their offspring never fails to return to the original colour of the natives of the place.— Similar varieties happen to many other species of animals; as rats, mice, moles, horses, &c. which are sometimes also destitute of the usual colouring matter in the skin, hair, and eyes.

M. de Saussure, in his "*Voyages dans les Alpes*," gives us a description of two *Albinos*, or white boys, at Chamouni.—According to his account, their eyes are not blue, but the *iris* of a very distinct rose-colour; the *pupil*, too, when viewed in the light, is decidedly red, which seems to shew that the interior membranes are deprived of the *uvea*, and of the black *mucus* that should line them. Their hair, their eye-brows, eye-lashes, and the down upon their skin, were all, in their infancy, of the most perfect milk colour, and very fine; but their hair is now of a reddish cast, and has grown pretty strong. Their sight, too, is somewhat strengthened, though they exaggerate to strangers their aversion to the light, and half shut their eye-lids to give themselves a more extraordinary appearance.—He seemed to think that the redness of the *iris*, and their intolerance of light, argued a suffusion of blood and organic debility. But M. Blumenbach, a learned physiologist, who had maturely

considered their case, attributes it to a different cause. He thinks it is occasioned by the want of that brown or blackish *mucus* that, about the fifth week after conception, covers all the interior parts of the eye in its sound state.

2. PYEBALD, BLOTCHED, OR PARTY-COLOURED, BLACK-AND-WHITE PEOPLE.

Frequent instances of pyebald people occur. Some children are born so, and others become so afterwards. The parents of such offspring are always, one or both of them, black, as no instance of European white parents having such offspring has been known. It is remarkable, that the blotches are distinctly defined, the colours not running gradually one into the other. The same thing is observable in pyebald horses, cows, pigs, and dogs; which are very common, at least in Europe.

3. OTHER IRREGULARITIES OF COLOUR.

In the 55th volume of the Philosophical Transactions, page 45, *James Parsons*, M.D. and F.R.S. relates two singular irregularities of the colour of children. The first is, that several years ago, a black man married a white woman in York, who, in due course of time, had a child that was entirely black, and very much like the father, both

in colour and features, without the least participation of the features or colour of the mother. The second is, that a black man married a white woman in London, who afterwards had a daughter, as fair as any one born of white parents, and like the mother in features; but her right buttock and thigh were as black as the father.

In the *Encyclopædia Britannica*, under the article *Negro*, we find an account of a young negro woman in Virginia, wife to a negro man, who had for the first time a black child, and the second time twins—a boy that was black, and a girl that was a mulatto. The boy as he grew up was a perfect negro: the girl, on the other hand, was tolerably white; had blue eyes, and long black hair, without curl. In short, she had a great resemblance to the overseer of the plantation. Becoming pregnant the third time, she was delivered of three children, two of them mulattoes, and the other a perfect negro. Respecting this account, I would observe, that since physiologists do not allow of a superfetation, except in cases where there are two *uteri* and two *vaginæ*, which there was no reason to suspect in the present instance, we are obliged to consider the overseer, or some other white man, and not the black, as the father in the two last births. In addition to these, I must notice a case related to me by my worthy young friend Mr. *John Bayley*, of Hope.—As he was travelling from London to Windsor, in a stage-coach, he had for a fellow-traveller, a negress, with her two children that were twins,

a month old: the one was perfectly black, with short, woolly, curled hair; the other was white, with long hair. She informed him that the father was an Englishman.

The following very singular particulars are taken from the Zoological Magazine, No. 12, page 369; but I dare not vouch for their authenticity.—1. In 1759, a girl was born in Somersetshire, with the hair on her head of two remarkably distinct colours. After she was grown up a little, the hair on the right side appeared of a jet black, resembling the father's; whilst that on the left side was of a caroty red, resembling the mother's; each occupying one half of the head, from a vertical section of the front.—2. It is said, that a few years ago a person kept a public house in Tooley-street, Southwark, the whole right side of whose body was white, and the left side black. His father was white, and his mother black.—3. A Mr. John Clark, of Prescot-street, Goodman's Fields, is said to have had half of his body white, from the navel upwards, and the other half black. His father was a native of Africa, and his mother an Englishwoman.

Taking into consideration the circumstances respecting the Albinos, the pyebald, and other anomalous productions, we find nothing that points out climate or the state of society, as any way concerned in effecting those modifications in colour.

Upon the whole, therefore, when we survey the various classes of mankind, scattered over the surface of the globe, the white European, the copper-coloured American, the black African, and people of various other less distinguished shades; and when we consider the several facts and observations above adduced, which the experience of two centuries has afforded, it must be evident, the opinion that all people descended from one pair at first cannot be maintained, unless we find some other causes of the diversity of colour besides those which have been usually assigned for it.

CONCLUSORY OBSERVATIONS.

WHERE, for the illustration of any subject, a variety of facts are collected from every part of the globe, many of them must of course depend upon the relation of persons whose impartiality or whose accuracy of observation may in some instances be questioned.—Enough, however, it is hoped, is ascertained to disprove the theories by which naturalists have attempted to account for what they denominate *varieties* of the human species; and to establish that of a *gradation*, as well of the human race, as of the animal and vegetable kingdoms in general.

A gradation in the human race, supposing all to have descended from one pair, could only be the temporary result of accidental causes, and would scarcely merit a minute investigation. But as a contemplation of the facts produced, leads to the conclusion, that various species of men were originally created and separated, by marks sufficiently discriminative, it becomes an important object, in general physiology, to trace the lines of distinction. Previously to discussing the question of *species*, it seems necessary to consider the signification of the term as used by naturalists.

It has been found convenient for the purposes of science, to divide the three kingdoms into *classes, orders, genera,* and *species*, each superior denomination comprehending one or more of the inferior. With respect to the three first divisions, Nature herself does not seem to define, or even to recognize them, but leaves it for the sagacity of the naturalist to seize the leading characteristics, and to arrange her productions accordingly. Of the last, however, there must be some determinate and invariable number, otherwise the productions of Nature would be liable to change every generation; and the species of animals, vegetables, and minerals, at this day, might be expected to be very different from what they were one or two thousand years ago. We find the fact to be, that where Nature is left to herself, and not interrupted by the artifice of man, as in wild animals, all kinds maintain their respective *specific* distinctions, through a series of generations; and that anomalous productions are rarely met with. This leaves us to infer, as most naturalists have done, that species were originally so created and constituted, as to be kept apart from each other, with certain characteristic distinctions, which form a proper subject for investigation. These distinctions, notwithstanding, have not, as it should seem, been ascertained in all cases,—a diversity of opinion respecting them still prevailing, as may be seen by the quotations employed in the first part.

The most generally received characteristic of species is derived from generation. When animals, however unlike, can breed together, and their offspring is prolific, it has been deemed sufficient to warrant the conclusion that they are of the same species, the diversity of the parent animals being attributed to accidental circumstances. On this principle, not only the various kinds of dogs, but even foxes, wolves, and jackalls, must be considered as of one species. It is allowed, however, that some animals, of different species, will breed together, as the horse and ass; but the circumstance of their offspring being barren, effectually precludes the possibility of their being of the same species. Some proofs have indeed been adduced, and upon good authority, of mules generating, although it must be acknowledged that such instances are extremely rare.

This hypothetic characteristic of species, derived from generation, will, I am afraid, not be found to agree with facts well ascertained.—It is known to every one, notwithstanding individuals of the same species are all discriminated one from another, yet that like animals generally produce their like, within certain degrees: even when the parent animals differ much from each other, the offspring, under the influence of this law, is of an intermediate nature, partaking of the properties of both. This being admitted, it is next to impossible to conceive in what manner the species of dogs, for instance, could have branched out into that diversity of

kinds above alluded to, supposing that they are descended from one pair. But, even waving the enquiry how they came to be so diversified, taking them as they really are at this moment, and allowing them a free intercourse, they ought all to be reduced, in a few generations, to one common mould, resulting from a mixture of all the varieties now subsisting. This certainly ought to follow, on the supposition that they are all of one species, and equally prolific.

It may be said, the supposition of a free intercourse is not admissible, because the varieties once subsisting are carefully preserved by attention in the breeding. This is perhaps in some degree true; but still an enquiry will be suggested,—why does not Nature, though under these restrictions, occasionally produce those varieties which she is supposed to have been the author of at some former period? Why does not the grey-hound occasionally produce a mastiff, the spaniel a bull-dog, and the lap-dog a wolf? These are difficulties which the advocates for the hypothesis ought, if possible, to obviate; since, whilst they exist, they seem to render it altogether untenable.

I should rather suppose that the different kinds of dogs, which, from time immemorial, have preserved their distinctive qualities, are in reality separate species of animals; and that all others are only varieties, or mongrels, produced by the intermixture of those species, and which, like the mule, in

one, two, or more generations, in the mongrel line, lose their prolific quality, and consequently become extinct. — Neither the truth nor falsehood of this opinion can, I apprehend, be proved absolutely from any facts known at present; but thus much must be admitted, that the present and former states of the dog kind, are perfectly in agreement with the hypothesis just advanced. Most certainly, the state of this domestic animal, at present, in regard to kinds and varieties, compared with what it was at any former period, does not lead us to conclude that the varieties are upon the point of swallowing up the different kinds, which are as numerous and excellent as in any former period: — yet this conclusion is always presented to us by the other theory.

To apply this to the human race. — Mr. *Long*, in his History of Jamaica, affirms that he never knew two mulattoes have any offspring; and he seems suspicious, that in the few instances where a mulatto-woman, married to a mulatto-man, may have had offspring, it is very probably derived from another quarter. I should, however, suppose, that numerous instances might be found where two mulattoes have had offspring; yet, certainly, the fact related by Mr. *Long* is sufficient to warrant the conjecture, that mulattoes, confined to themselves, are not so prolific as others. The small proportionate number of mulattoes in the West Indies and in America, compared with what they should have been

if equally prolific with other people, is a striking circumstance.

If this doctrine be admitted, it will be asked, How are we to distinguish species from varieties? In answer to this, it may be observed, that varieties are reducible to the common stock again. Thus, amongst men, *Albinos* are varieties, which do not fail in succeeding generations to return to the common stock. In vegetables, the variegated holly, for instance, will return to the common green holly, when propagated by seed, and can only be preserved as a variety by grafting.—With respect to family, provincial, or national varieties of feature and complexion, it may be observed, that the more confined and circumscribed the intercourse of any people may be, the more they will assume and retain a sameness of appearance; by reason that every anomaly of feature is worn out, through continual intermixture with those more nearly resembling the standard. The people of every country, therefore, which has been long inhabited, and from which foreigners have been in a great measure excluded, will have the characteristics of its first settlers, who, if few in number, might entail a peculiar cast of features on their posterity. In England, where the intercourse with foreigners has been great, and consequently a great variety of features is found, we could select individuals who would entail, if circumstanced as above, the Scotch, the Irish, or

other European national characteristics, on their posterity;—whereas, were we to range over Europe, we should not find men likely to propagate a race of negroes or copper-coloured Americans.

From the numerous facts which have been adduced, it must appear evident, that various differences exist in the human race; some of which are generally known,—but others, it is presumed, have never been before pointed out. In the bony system, it has been shewn that the head, the arms, and the feet, differ materially; characteristic differences have also been pointed out in the hair, the colour of the skin, the complexion, the being adapted to a particular climate, and the being subject to different diseases in the same situation.

There are but two ways of accounting for this great diversity in the human frame and constitution. 1. To suppose that the diversity, great as it is, might be produced from one pair, by the slow operation of natural causes. 2. Or to suppose that different species were originally created with those distinctive marks which they still retain.

The advocates for the first opinion, have endeavoured to account for the colour of man from the effects of the climate in which he resides. Indeed, if climate can account for any particular diversity, it must be that of colour; for

it is difficult to conceive in what manner it can affect the other differences, one way or another. Some have endeavoured to maintain, that in the course of about two centuries, during which white people from Europe have resided in the torrid zone, and negroes from Africa in the temperate zone, there is a small but visible change in colour, the whites approaching a little towards black, and the blacks towards white; but they have by no means made out the fact in either case. Indeed, as has been already observed, the fact seems to be, that no general and permanent affection of colour is produced by climate. The temporary discolouration of the skin, called tanning, seems to have no relation to the permanent colour of the skin: it arrives at its *maximum* a very short time after it begins, and is as soon worn off again; whereas the permanent black colour (supposing, for argument sake, it could be effected in time) must require many centuries to effect it. Thus the father, it is supposed, transmits his degree of colour to the son, and the climate still keeps increasing it; and hence ultimately, from the climate alone, or at least from external circumstances, we are taught to expect the complete change from black to white, or the contrary, in the course of perhaps fifty or a hundred generations.

As to the opinion, that the constitution of man may be adapted to any climate by long residence, it is not only unwarranted by facts, but is in direct opposition to all ana-

logy, drawn from the animal and vegetable kingdoms at large.

On the other hypothesis we can easily account for these and other diversities in the human race; or rather indeed the hypothesis itself presumes upon such diversities. Besides, we find that, in those animals which most nearly resemble man in their bodily conformation, there are a great number of species differing but in small degrees one from another. The same observation, indeed, may be extended to the animal kingdom in general. Why then should we seek to infringe this apparent law of nature in regard to man, unless to serve an hypothesis?

The opinion here maintained, so far from degrading, tends much more to dignify the human race than the opposite one. For if, according to the latter, we admit that such great varieties can be produced in the same species as we find to exist in man, it would be easy to maintain the probability that several species of *simiæ* are but varieties of the species Man; since they differ as little in their organization from some individuals of the species, as these do from men in general. And if the argument be still further extended, almost all the animal kingdom might be deduced from one pair, and be considered as one family; than which a more degrading notion certainly cannot be entertained. But the opinion advanced above, effectually precludes any such consequences, as it places each

species upon its own proper basis, and debars them from intermixing with other species, unless nearly resembling themselves, and even that in a limited manner.

Different species of men being once admitted, it will become a proper object of physiological enquiry to determine their number and distinction, with the merits, excellencies, and defects of each. In pursuing this enquiry there is no doubt but gradation will afford the proper clue to direct us. What the number of species may be, is not perhaps easy to determine. The four quarters of the globe will each, probably, furnish us with at least one. In Africa, however, there seems to be more than one species: and perhaps the lowest degree of the human race resides there. I am inclined to think that hair, rather than colour, ought to guide us in that quarter; and that it is not the blackest inhabitants, but those with extremely short hair, and a most ungracious appearance, as the Hottentots, who may be reckoned the lowest on the scale of humanity. The Negro, the American, some of the Asiatic tribes, and the European, seem evidently to be different species.

Ascending the line of gradation, we come at last to the white European; who being most removed from the brute creation, may, on that account, be considered as the most beautiful of the human race. No one will doubt his superiority in intellectual powers; and I believe it will be found that his capa-

city is naturally superior also to that of every other man. Where shall we find, unless in the European, that nobly arched head, containing such a quantity of brain, and supported by a hollow conical pillar, entering its centre? Where the perpendicular face, the prominent nose, and round projecting chin? Where that variety of features, and fulness of expression; those long, flowing, graceful ringlets; that majestic beard, those rosy cheeks and coral lips? Where that erect posture of the body and noble gait? In what other quarter of the globe shall we find the blush that overspreads the soft features of the beautiful women of Europe, that emblem of modesty, of delicate feelings, and of sense? Where that nice expression of the amiable and softer passions in the countenance; and that general elegance of features and complexion? Where, except on the bosom of the European woman, two such plump and snowy white hemispheres, tipped with vermillion?

BEFORE we conclude, it may be proper to attend a little to those who may object to the doctrine herein contained upon other than philosophical principles.

Some may reprobate it, under the apprehension that it has a direct tendency to discredit Revelation.—To these it may be observed, that Revelation was given to man for a different purpose than to instruct him in philosophy and natural history. The Mosaic account of the creation is believed, by most rational Christians, to be allegorical. But, even if we believe the account to be literally true, another race of mankind besides that descended from Adam, seems implied in the text: for we nowhere read of Adam and Eve having any daughters, until it is said their eldest son ‘Cain went out from the presence of the Lord, and dwelt in the land of Nod, on the east of Eden. And Cain knew his wife, and she conceived and bare Enoch*. Who then was Cain’s wife, and whence did she come?

Indeed it is said (chap. v. ver. 4.) that ‘the days of Adam, after he had begotten Seth, were eight hundred years, and he begat sons and daughters.’ This it should seem took place after the birth of Seth, and consequently long after Cain had his wife; for Seth was not born till after the death of Abel. If Cain had sisters prior to

* Genesis, chap. iv.

that period, from amongst whom he might have taken a wife, it is a singular circumstance that Moses should not have noticed them.

Respect and deference are due to another description of persons; those whose happiness is involved in the abolition of the Slave Trade.—Some of these may say, that at present the agitation of a question of this nature, tending to establish an opinion, that the Africans are of an inferior species, whatever truth there may be in the opinion, is peculiarly ill-timed. When such strenuous and repeated, but hitherto too fruitless efforts, have been made to induce the legislature to abolish this infamous traffic, every opinion disadvantageous to the Africans ought to have been repressed, until its publicity could not have influenced the question of abolition.

To such it may be replied, that the Author had not the Slave Trade at all in view in this Enquiry; his object was simply to investigate a proposition in natural history. He is fully persuaded the Slave Trade is indefensible on any hypothesis, and he would rejoice at its abolition. The negroes are, at least, equal to thousands of Europeans, in capacity and responsibility; and ought, therefore, to be equally entitled to freedom and protection. Laws ought not to allow greater freedom to a *Shakespeare* or a *Milton*, a

Locke or a *Newton*, than to men of inferior capacities; nor shew more respect to a General *Johnstone*, or a Duchess of *Argyle*, than the most unshapely and ill formed.

Respecting the opinion that negroes have no souls, the Author utterly disclaims it: — he conceives that all mankind, of whatever description, are alike entitled to the hope of a future state.

The Atheist too, though he will pretend to reason upon philosophical principles, will more particularly object to the doctrine herein contained, because it seems peculiarly to require the agency of a Creator; but to him no further reply is thought necessary than what is contained in the general argument.

Under the idea that whatever tends to elucidate the nature, constitution, and history of the human race, must be interesting to man; and that whatever tends to display the wisdom, order, and harmony of the creation, and to evince the necessity of recurring to a Deity as a first cause, must be agreeable to man, the Author submits this Work to the judgment of the public.

APPENDIX.

DETACHED PASSAGES,

SELECTED FROM

PROFESSOR SOEMMERING'S ESSAY

ON THE

COMPARATIVE ANATOMY

OF

THE NEGRO AND EUROPEAN*.

I. **I**N a conversation with Professor *Lichtenberg* on the subject of this Essay, he with great acuteness directed my attention to the manner in which the connexion is made between the head and trunk in the Negro and European. In the former (as if a portion of the hind part of the skull were removed) the depression between the head and shoulders is much less considerable: a conformation

* Ueber die Körperliche Verschiedenheit des Negers von Europaër. Frankfurt & Mainz, 1785.

exhibited by animals of the ape tribe* in a still more remarkable degree.

II. In the Negro the aperture of the eye-lids is smaller than in the European; and of course less of the eye is visible. The eye-ball is perhaps larger; a blackish ring, about half a line in breadth, surrounds the cornea; and the albuginea (as in some apes) instead of a pearly white, is of a dirty yellow colour.

That process in the inner canthus, which bears some analogy to the *membrana nictitans*, is, according to *Camper's* observations, and my own, larger in the Negro.

The iris is in general of an uniform dark brown colour; and Dr. *Walter* † remarks that it is broader towards the temples than towards the nose.

The external surface of the choroid coat is completely invested by mucus of a darker hue and firmer consistency

* The author wishes his readers to apply this, and similar expressions, principally to the orang-outang (*Simia Satyrus*) or to that animal and the pigmy ape, *Simia Sylvanus*.

† *Von den Venen des Auges.*

than usual. A provision of the same kind appears in the eyes of some *simia** in my collection.

The uncommonly black pigment which lines this coat, has been noticed by Dr. *Loder* and Dr. *Walter*, as well as by myself.

Dr. *Walter* thinks that the *retina* is of a more robust texture than in Europeans.

III. The nose is flat, short, and disproportionably broad; and may be said to lie on the upper lip, rather than to project over it. Its extremity is obtuse, and turned upwards. The nostrils are wide.

IV. Although the Negro's lips are large and turgid, and incline more to a bluish black than to a dirty rose-colour, they afford an obvious and decisive characteristic, which distinguishes him from all animals of the ape genus†. For Nature has refused lips to every animal of that tribe, without an exception in favour of the orang-outang, who has no farther claim to a pre-eminence than what is conferred by the caprice of artists‡.

* *S. Cynomolgus*. *S. Mormon*.

† This is accounted for in the body of this work, p. 67, 68.

‡ This animal is represented with lips in the following excellent engravings,

I am at a loss to divine Mr. *Kluegel's** reason for asserting that the colour of the Negro's lips is a *beautiful red*. In order to ascertain the accuracy of my own statement, I wrote to Mr. *Billmann*, whose situation at *Cassel* enabled him to examine many African Negroes, and on whose veracity and discernment I can rely with confidence. He informs me that their lips are invariably of a dirty rose-colour, which admits of various degrees of intensity in different subjects; but that, even in those instances where the lips are so light as to form no striking contrast with those of Europeans, their *rete mucosum* is perceptibly tinged with the prevailing hue of the complexion. He is of opinion, that without any regard to the darker or lighter colour of the body, the lips of young Negroes are never so deeply stained as those of adults. He met with one man, whose lips were so black, that it would not have been easy to distinguish them, by colour alone, from the rest of the face. This person was by no means so dark as many of his countrymen, but appeared to be advanced in years. Mr. B. is, in short, fully convinced that the lips of Negroes, whether male or female, are at no period of

TYSON'S Anatomy of a Pygmy, tab. I. EDWARDS'S Gleanings of Natural History, part I. tab. 213. VOSMAER Beschryving van de zo zeldsamer als zonderlinge Aap-soort genaamd Orang-outang van het Eiland Borneo, &c. Tabb. xiv. xv.

* *Encyclopedie*. Berlin, 1782, I. Band. § 329. Conf. WUENSCH, *Kosmologische Unterhaltungen*, III. B. § 86.

life of so pure a red as those of Europeans; and that they constantly approach more or less to blackness.

V. The Ear is of a more circular shape than in Europeans; and resembles, somewhat more closely, the same organ in apes. It seems frequently to project farther than usual from the head. It is a well-known fact, that savages can move their ears at pleasure, and possess the sense of hearing in great perfection*.

VI. To those who have frequent opportunities of seeing Negroes, it may seem superfluous to remark, that the relative proportion of the features hitherto described, differ widely in different individuals; and form as great a variety of physiognomies as prevails in Europe. The features of some Europeans are not unlike those of Negroes. A person of this description lives in my neighbourhood; but his mother, it must be confessed, was suspected of improper intercourse with an African. The skull of a Thuringian, in the possession of Dr. *Loder*, has prominent jaw-bones, wide nostrils, a flat nose, &c. forming, in the estimation of the owner, an intermediate link between the European and the Negro. A student of his acquaintance has almost the entire physiognomy of a Negro. The uncertainty, however, with respect to male parents, ought to be called to mind on these occasions.

* BLUMENBACH *vom Bildungsstiege*, § 39.]

In like manner, some Negroes are handsomer than others. M. *Adanson**, for instance, maintains that the Negroes of *Senegal* are the handsomest of the race.

VII. The jaw-bones, and the cavities which contribute to form and to protect the organs of sense (whether considered absolutely, or with a reference to the rest of the head) are constructed on a larger scale in the Negro; and are probably better adapted to their office than in those tribes of mankind in whom a superior understanding supplies the imperfection of mere animal accomplishments. If we were to take for a basis the bones composing the face of an African, and endeavour to complete the skull according to the proportions of European symmetry, the space allotted to the brain, on such a system, would be uncommonly large. But this part of the subject will be discussed in a future paragraph.

VIII. *Camper* has proved, agreeably to the principle of his facial line, that, in the finest Grecian relic of ideal beauty, the bones of the head are in the largest, and those of the face in the smallest possible proportion. The brow advances to a line with the nose, mingles with the arch of the head, and, like the occiput, is lost in a gentle curve:—a conformation eminently fitted to provide an ample space for the brain.

* *Histoire Naturelle de Senegal*, p. 22

IX. In the construction of the Negro's skull, which is low and flat, both behind and before, Nature seems almost to have reversed the proportions of her favourite model. Were we to compare two skulls, in which the distance between the root of the nose and the alveoli was equal, we should find the os frontis longer in the European than in the Negro. The depression between the superciliary arches is tolerably well expressed on the skull of an old Negro in my collection, though wanting in one of Professor *Blumenbach's* specimens. The foramen magnum of the os occipitis appears to be somewhat wider; and the condyloid processes seem to be placed farther forwards in the Negro than in the European.

X. The Negro skull, viewed in front, appears to be compressed at the sides, especially at the upper part; its cavity seems to be straiter; and the parietal bones smaller in every dimension, than in European skulls. In some of the finest specimens of mummies, according to *Blumenbach*, the head is still more compressed than in the Negro*.

In *Camper's* unpublished Commentaries on Osteology, the breadth of the head is said to be greatest in the Asiatic, of middle size in the European, and least in the African. But although this remark, so far as it respects the Negro,

* *Gottingische Anzeigen*, 1785, § 109.

accords with my own experience, it does not apply with equal universality to mummies; for the diameter of a skull of this description, preserved in the Anatomical Theatre at *Cassel*, does not vary in the least from the European model.

XI. The impresson left by the attachment of the upper margin of the temporal muscle, extending from the os frontis over nearly the whole of the os parietale, is deeper, and ascends nearer to the sagittal suture in the Negro than in the European. Hence we might infer the superior size of that muscle, if opportunities were wanting of examining it in the recent subject.

XII. The extraordinary height and circumference of the zygomatic arch can leave little doubt that the bulk of the temporal muscle is likewise very considerable. On this cause depends the protuberance of the cheek-bones, which are uncommonly large, and nearly quadrangular.

XIII. The orbit is deeper, the line described by its margin is of greater length, and the eye itself is probably larger in the Negro than in the European. Professor *Bonn* has remarked a similarity in the construction of these cavities, between a Negroes and the ape*. “Foramina oculorum in uno eodemque plano verticali posita, quod similibus proprium.”

* Descriptio Thesauri Hoviani, p. 133.

XIV. The nasal bones (which are in one instance of a quadrangular shape, but in another converge, as in apes, so as to form a very acute angle at their junction with the os frontis) lie, in two specimens, nearly in the same plane, without forming a saddle. In a third skull they do not sensibly differ from the same bones in Europeans.

XV. That part of the os unguis which receives the lachrymal duct, and is separated from the rest by a prominent line, is in these skulls remarkably small; and the channel of the duct is, of course, formed principally in the nasal process of the upper maxillary bone.

XVI. When the head is seen in front, the cavity of the nose appears uncommonly large. In Europeans, under similar circumstances, I have been unable to discover so wide a portal to the organ of smell, or a cavity so extensive within. Professor Bonn observes of the skull of a negress, "*riktus nasi major.*" In the skull of a North American Chief, in Professor *Blumenbach's* collection, this cavity is proportionally larger than in many Negroes*.

Haller † remarks, that Negroes in the Antilles can distinguish, by scent, the footsteps of a Negro and a French-

* Gotting. Anzeigen. 1785, § 1. 12. Conf. BLUMENBACH, *Inst. Physiolog.* p. 195. Commentationes Soc. Reg. *Gottingensis*, vol. x. tab. 9.

† *Elementa Physiologiæ*, tom. v. p. 179.

man. It has been, in like manner, asserted of some inhabitants of the continent of America, that they can discriminate the effluvia of the natives of France, Spain, and Great Britain*. Experience must decide whether this observation will apply to the genuine Negro of Africa.

XVII. But that nature intended him to possess a more exquisite sense of smell than his European brethren, is evident from the size and configuration of the ossa turbinata superiora. The middle pair of these fine convoluted bones forms on each side of the nose pretty large globular protuberances, which must considerably extend the surface of the olfactory membrane. Instances of the same mechanism, in an inferior degree, have been observed in Europeans by Professor *Blumenbach* and myself. Such instances, however, being very uncommon, it is remarkable that all my Negro skulls should agree in this peculiarity. A similar lusus was pointed out to me by Dr. *Ries*, in a skull belonging to the Anatomical Theatre at Frankfort on the Main.

In one of my Negro specimens, the cribriform plate of the ethmoid bone occupies a prodigious space in the base of the skull.

* *PERNETTY ap. DE PAAW, Recherches Philosophiques sur les Americains, tom. iii. p. 94.*

XVIII. The meatus auditorius externus is wider than in Europeans. The mastoid process, which is wanting, or scarcely discernible in apes, attains its usual magnitude. The styloid process, which is very obscure in all my specimens of *fimix*, is of considerable size. The ossicula auditus are of the usual size and figure.

XIX. The roof of the Negro's mouth, which is perhaps wider, is evidently of greater length, and sculptured with deeper inequalities than the Europeans. The union of the ossa palati with the upper jaw-bone is effected rather by *future* than *harmony*.

XX. The passage by which the nose and mouth communicate, is of a size equally remarkable as the external aperture of the nose. The pterygoid processes, which are larger, and placed at a greater distance from each other, present a broader and more uneven surface than in Europeans.

XXI. The alveolar processes of the upper jaw (which is of a size proportionable to the bones already described) are considerably protuberant, and form a characteristic trait in the Negro's physiognomy. — The spina nasalis, which generally resembles a hook bent downwards, is wanting in three skulls. In one of them only a slight vestige of it is discernible. — The lower part of the pyriform aperture

wants that acute margin which it commonly has in Europeans.

The foramen incisivum is larger; but that obscure vestige of a *suture* which separates the canine teeth from the incisors, and corresponds to the partition of the *os intermaxillare* in quadrupeds, is not more strongly expressed in the Negro than in the European. This bone may, therefore, be regarded as a general character of brutes.

The foramen and canalis infraorbitalis, like the nerve and artery they transmit, are larger in the Negro.

A wide arch is formed by the junction of the upper maxillary and cheek-bones; but it is less considerable in one specimen than in the other two.

Professor *Blumenbach* regards the protuberance of the jaw-bones as the most distinguishing feature in the Negro's countenance; and observes, that it serves more especially to separate him from the original inhabitants of Egypt, in whom (as appears from the inspection of mummies) these bones, though of very uncommon size, were not protruded.

XXII. The fissura sphæno-maxillaris is apparently larger; but the small wings of the *os sphæroideum* are considerably shorter than in Europeans.

XXIII. No peculiarity is to be discovered in the structure of the vomer, or of the ossa turbinata inferiora.

XXIV. The lower jaw, which is broad, thick, and less uniform on its surface, is shortened at the sides and extremity. The angle of the jaw, which in us is generally obtuse, approaches nearer to a right angle; that part of it which is covered by the masseter being unusually broad in the Negro, as well as in the ape. This description perfectly applies to three skulls of Negroes of mature age. But it ought not to be concealed, that a skull belonging to Professor *Blumenbach* forms an angle of 130° , which is not uncommon in Europeans, among whom this angle is exceedingly liable to vary in different individuals.

XXV. The teeth are generally found, and compose a very compact row. They are broad, thick, and long; more especially the canine teeth. Their number, in an instance where there were three *molares* more than usual, amounted to thirty-five. The tooth corresponding to the sixth *molaris* in the lower jaw, on the left side, had not made its appearance. Mr. Billman, who has been at the trouble of counting the teeth in various subjects, assures me that he never found more than the usual number. The Negro's teeth are not exempt from caries, as appears from specimens in my museum.

In a communication to Dr. *George Forster*, Professor *Camper* ascribes the confused arrangement of the teeth, which is frequent in all the northern tribes of mankind, to the smallness of the space comprized between the canine teeth of the lower jaw. These seem to displace the incisors; for the jaw-bones are not only narrower in the inhabitants of the north than in the natives of the southern hemisphere, but appear of very inconsiderable breadth when contrasted with those of an African or Asiatic.

In consequence of the upper jaw protruding immediately below the nose, the alveolar process and teeth obtain an oblique direction; and form, with the line in which the maxillæ meet, an acuter angle than in Europeans. This is admirably demonstrated in the drawings of *Camper* *.

XXVI. The tongue, as might be expected from the parietes that inclose it, is larger in the Negro than in the European.

Slender bony processes †, about half an inch long, were attached to the less appendices of the os hyoides. These were not produced by ossification of the ligaments; for, in

* Blumenbach Osteologie, p. 87.

† They perfectly resemble those delineated by *PLANCUS*: *De Monstris Epist.* Venet. 1749, tab. iii. fig. 5. and are not peculiar to the Negro, as I have frequently observed them in Europeans of different sexes.

the subject in question, many of the bones (the humerus for instance) had not completed their growth.

XXVII. None of the muscles of the face, except the masseters, and those of the external ear, are uncommonly large. From the extraordinary size of the masseters, and from what has been suggested concerning another muscle employed in manducation, it may be presumed that the Negro, in his native climate, was designed to subsist chiefly on vegetables.

XXVIII. The ribs are larger, and more boldly curved than in Europeans. This is still evident in the natural skeletons, which have lost by exsiccation more than two Parisian inches in height.

In one instance within my own observation, and in three recorded by *Camper*, seven (or the ordinary number of) ribs were attached to the sternum; but the eighth appeared to approach nearer to the sternum than usual.

In one of my skeletons, and in a preparation described by *Camper* *, the sternum receives the cartilages of eight ribs on each side. In apes, eight or more ribs are generally attached to it. Instances of this sometimes occur in

* Verhandelng over den Orang-Outang, p. 15. § 7.

Europeans, as in a body which I dissected a few days ago*.

XXIX. An accessory muscle of the chest was discovered in a Negro by Dr. Bonn†. It originated by a tendon from the cartilage of the third, and was implanted in the sixth rib, near its termination. This muscle is constant in quadrupeds‡; and one corresponding to it has been occasionally observed in Europeans||.

XXX. The female breasts, according to various writers, are flaccid and pendulous.

* The number of true ribs in the *Patas*, *Malbrouck*, *Magot*, and *Papion*, is eight, according to Daubenton: in the *Mone*, *Coaita*, *Sajon Brun* (my specimen of which has only eight) *Sai* and *Saimiri*, nine. The *Jocko*, *Gibbon*, *Talepoin*, and *Ouistiti* have seven, like the human species. Eight is stated to be the general number in the ape-genus, by Riolanus, *Osteologia Simiæ, sive ossium simiæ & hominis comparatio*; of which an extract is given by Tyson, p. 67. Conf. Camper, l. c. and Volcher Coiter, *Externarum & Internarum C. H. partium tabulæ*, No. rib. 1573, *tab. ad pag.* 66.

Camper's Orang-Outang had only six true ribs. It is singular, that although Tyson's Pygmy is stated in the text to have no more than seven, the cartilage of the eighth rib is, in his plate of the skeleton, attached to the sternum. It is hazardous to entrust artists with the execution of anatomical designs.

† Sandifort, *Exercit. Acad.* fasc. 1. Lugd. Bat. 1783, p. 83.

‡ Douglas, *Descriptio Comparata Musculorum Hominis & Quadrupedis*.—L. B. 1729, p. 29.

|| Albinus, *Musc. Hom.* L. B. 1734, lib. iii. cap. 78. p. 291.

XXXI. The shoulders are not so broad and muscular as in Europeans.

XXXII. The navel forms a round projection, like a small hernia.

XXXIII. The Negro is slender in the iliac region. One of my skeletons has six lumbar vertebræ, without any variation in the number of cervical or dorsal vertebræ: an anomaly which I have witnessed in Europeans on different occasions*. The foramina, which admit vessels and ligaments, are in all the vertebræ, but more especially in those of the back, of a very extraordinary size. The hips and pelvis are narrow.

Dimensions of the Pelvis.

1. In the skeleton of a male Negro, æt. 20.

						Inches.	Lines.
Large diameter	=	=	-	-	-	3	11½
Small diameter	-	-	-	-	-	3	7½

* The late Mr. *George Hunter* (son to Dr. H. of York) informed me that he had met with six lumbar vertebræ in the dissection of a Negro; and that several experienced anatomists in London had regarded it as a very extraordinary occurrence. The following passage from *Camper*, may be adduced, if necessary, in

[x]

2. Of a Male Negro, æt. 14.

						Inches.	Lines.
Large diameter	-	-	-	-	-	3	2
Small diameter	-	-	-	-	-	2	9

3. Of a European, æt. 16.

Large diameter	-	-	-	-	-	4	3
Small diameter	-	-	-	-	-	3	9

4. Of a well-made European adult, of inferior size to the Negro, No. 1.

Large diameter	-	-	-	-	-	4	6
Small diameter	-	-	-	-	-	3	11

Camper * remarks, that the large diameter of the pelvis is to its smaller diameter in the following proportion:

In a Negro	-	-	-	-	as	39	to	27½
In an European	-	-	-	-		41	to	27

Although this Negro was much taller than the European.

support of Dr. *Soemmering*'s assertion:—"Reticere non debeo, in aliquibus spinis
" fex vertebrae lumborum observari; duas tales in museo meo affervo. Divisio
" arteriæ aortæ tunc longe altior est, quam si quinque darentur," &c. *Demon-*
strationes Anatomico-Pathologicæ, lib. ii. cap. 2. § 1. E. H.

* Verhandelingen der Bataafsche Genootschap te Rotterdam. I. Deel.

In another European	- - -	as	44	to	28
Albinus's Male Skeleton	- - -		66	to	43
In a Female European, measuring 4 feet 4 inches	}		49	to	28
In two others	- - -		44	to	28
Farnese Hercules	- - -		48	to	34
Antinous	- - -		40	to	34
Apollo	- - -		36	to	28
According to Albert Durer	- - -		35	to	20
Medicean Venus	- - -		46	to	34

XXXIV. The parts of generation, contrary to a vulgar notion, are of no uncommon size. In two instances the prepuce was rather longer than usual; but it should be recollected that the Negroes of Senegal, who are not Mahometans, circumcise their children at the age of four or five; and that circumcision is likewise practised at Angola.

Littre asserts, that the naked extremity of the glans is black, like the rest of the skin*. This was not discernible in the Negroes I inspected; probably owing to the length of the prepuce.

XXXV. The fingers and toes are beautiful; but (as in apes) of uncommon length. They were all furnished with

* Memoires de l'Acad. des Sciences, 1702.

sesamoid bones, which occur more rarely in Europeans. Dr. *Strack*, Dean of the Medical Faculty in this University, remarked, both in my skeletons, and in living Negroes, that the hands and feet were unusually flat. The bones of the leg are placed obliquely outwards under the condyles of the os femoris; so that the knees are more distant from each other, and the feet are bent outwards. This deformity, which has been noticed by others, ought not to be regarded as a vicious conformation, as it is probably in unison with the rest of the frame.

XXXVI. But to proceed to the deviations which more especially affect the brain. Of these, it may be remarked, that they are not the creatures of art, nor of accident; but are general, if not invariable; and differ only in degree in different individuals. Most of the peculiarities now to be mentioned are to be seen in every specimen I have examined in the collections of others*, and in five very complete skulls which are in my possession. It will readily occur to my readers, that, in some instances, one or more of these characters may be wanting; as in Europeans, independently of disease, the bones often lose their distinguishing form. The height of the lower jaw, for instance, in aged persons who have lost their teeth, is frequently exceeded by its breadth; and the space between the nostrils

* Viz. Those of *Camper* at Klein-banckum; of *Hovius* at Amsterdam; of *Walter* at Berlin; and of *Blumenback* at Gottingen.

and the lower margin of the alveoli is, under the same circumstances, frequently inconsiderable.

XXXVII. I measured the skulls of various Negroes, and almost every European skull in my collection, to compare the size of their respective cavities.

1. I found the length of a cord passed from the root of the nose, over the middle of the os frontis, and along the sagittal suture to the middle of the posterior margin of the os occipitis, to be less in the Negro than in the European. The vertical arch is, therefore, smaller. In selecting the specimens to be compared, care was taken that the bones of the face were of equal length.

2. The circumference of the Negro skull, ascertained by a cord passing horizontally over the eye-brows, and the upper margin of the os temporum, is considerably less.

3. Neither the largest diameter of the skull, from the os frontis to the os occipitis; nor any smaller diameter, from one os parietale, or os temporum, to the other, attain the size they possess in Europeans*.

* The longitudinal diameter of the skull in a full-grown Negro, was 6 inches, 6 lines (Paris): the largest transverse diameter, 4 inches, 6 lines.

In a Negro, æt. 20

			In.	L.
Longitudinal diameter	-	-	6	11
Largest transverse, do.	-	-	4	10

4, 5, 6, 7. The principal bones which form the cavity of the cranium are, as has been shewn, collectively smaller. The os frontis, ossa parietalia, os occipitis, and os sphenoides appear smaller; although the ossa petrosa and the os ethmoides seem larger.

8. These bones possess a hard, compact, and brittle texture, like those of quadrupeds.

9. It must, however, be allowed, that the cavity of the Negro's skull somewhat exceeds in height that of the European.

From the preceding remarks we may infer, that in the Negro the size of this cavity bears a smaller proportion to the face and organs of sense, than it does in the European.

Negro, æt. 14

Longitudinal diameter	-	-	-	6	7
Transverse diameter	-	-	-	4	9

In Europeans, where the bones of the face were much smaller, than in the preceding instances.

Male.

6 6
5 6

Female.

6 6
5 1

Female.

6 8
5 3

Frenchmen

6 10
5 10

Skull from Berlin

6 6
5 6

XXXVIII. Daubenton first established the position, that in quadrupeds the foramen ovale is placed behind the centre of gravity in the base of the skull; whilst in man this opening occupies the centre*: a fact fatal to their hypothesis, who conceive the human race destined to crawl on all fours. In children the condyloid processes of the os occipitis are situated more anteriorly than in adults. In the Orang-outang†, and the rest of the simiæ, the foramen is placed behind the centre. In the Negro it appears to lie not quite so forward as in us.

This may be the reason why a Negro's skull, after the maxilla inferior is removed, being laid on a table, falls backward, so that the teeth do not touch, but are suspended at the distance of more than a line above the surface of the table.

The skulls of Europeans of mature age, usually incline forwards, and rest with equal ease on the teeth, or on the os occipitis. I have not, to my knowledge, been anticipated in this remark; but all Negro skulls do not possess the property I have described.

XXXIX. The brain of a male Negro, aged 14, weighed two pounds, ten ounces, and three eighths (Cassel silver

* Memoires de l'Acad. des Sciences, 1764.

† Camper : Verhandelng over den Orang-outang, Tab. ii. fig. 2.

weight); that of a Negro aged 20, but who had not perfectly completed his growth, weighed two pounds, thirteen ounces, and one quarter; viz. the cerebrum two pounds, seven ounces, one eighth, and the cerebellum six ounces, one eighth; a weight which the encephalon does not always attain in Europeans; for I have dissected adults whose brain weighed only two pounds, five ounces, and seven eighths. The last mentioned Negro was, however, uncommonly handsome, tall, and robust.

XL. Dr. *Walter*, like his predecessor Dr. *Mickel*, observes, that the medullary substance of the brain of a Negro he dissected, was of a firmer texture than usual; and possessed that degree of elasticity which sometimes occurs in the brain of lunatics. Now hence, probably, he inferred the superior firmness of the retina. (Vid. § VII.)

XLI. The nerves on the basis of the brain, on a comparison with those of Europeans under like conditions, appear somewhat thicker. This difference, which is most striking in the olfactory, optic, and fifth pairs, might be presumed from analogy. For, if the eye, ear, and organ of smell be larger, as has been stated, we must expect that the nerves which supply these organs will have a correspondent magnitude.

XLII. An examination of the brain of different classes of animals, conducted with great care, and under very

favourable circumstances, led me long ago * to the establishment of the following proposition; which has been since adopted and confirmed by that eminent physiologist, Dr. Monro†:—*Man has a larger brain than any other animal, if an estimate be formed of the proportion which the brain bears to the nerves derived from it.*

It was formerly taken for granted, that man possessed a larger brain than any other animal. To prove this, it was usual to compare the weight of the brain and of the body in man, and in the most common domestic animals. Thus far theory bore the test of experiment. But physiologists, desirous of establishing the fact on a wider induction, were involved in no small perplexity. They found, on this principle, that birds stood higher in the scale than man; and that seals (*cetacea*) and more especially the smaller quadrupeds, as the mouse, squirrel, &c. possessed an infinitely larger brain, in comparison with their body, though certainly not with respect to the organs of sense, or that part of the head which forms the face.

No positive conclusion can be drawn from an experiment in which the weight of the body, liable to be affected by

* De Basi Encephali. Gottingæ, 1778, page 17.

† Observations on the Structure and Functions of the Nervous System. Edinburgh, 1783, chap. viii.

fatigue, disease, the accumulation and loss of fat, &c. is compared with that of brain, which is more constant, and secure from some of the causes which have been enumerated. On the other hand, a comparison of the size of the brain with that of the nerves, is not only attended with less difficulty, but promises important conclusions.

XLIII. I am far from considering the nerves as excretory ducts of the brain; for it appears to me, that a very small portion of brain is requisite to enable them to perform the functions of vegetation, or mere animal life.

XLIV. A being, therefore, that, in an eminent degree possesses more than is necessary for this purpose, may be presumed to inherit a superior capacity of intellect.

XLV. Considered in this point of view, man, who in any other light holds but a middle station, stands confessedly at the head of the animal world. Apes of every description (for I have been so fortunate as to procure dissections from the four primary divisions of that genus) are, in this respect greatly inferior to him; for, notwithstanding the brain of these animals (especially of the smaller species, with prehensile tails) is heavier than the human brain, when compared with the weight of the body,—it should be recollected, that the eye, ear, tongue, nose, and

muscles of mastication, require, as being constructed on a larger scale, a greater supply of sensorial power to animate the nerves which are spent on these organs. Setting apart, therefore, a portion of their encephalon sufficient for these uses, the brain of these animals dwindles, in comparison with the human brain, almost to a cypher.

Animals of various kinds seem to possess this superabundant portion of brain in a greater or less degree, in proportion to their sagacity or docility*.

The largest brain of a horse, which I possess, weighs one pound, seven ounces: the smallest human brain that I have met with in an adult, two pounds, five ounces, one quarter. But the nerves on the base of the horse's brain are ten times larger than in the other instance, notwithstanding it weighs less by fourteen ounces, one quarter.

XLVI. But we are not hastily to conclude that the human species have smaller nerves than any other animal. In order that my ideas may be better understood, I shall state the following imaginary case.

Suppose the ball of the eye to require 600 nervous fibrils in one instance; and 300 in another, though only

* Vid. Ebel: *Observationes Neurologicæ ex Anatome Comparata*. Traj. ad Viadr. 1788,

half the size of the former : farther, that the animal with 600 fibrils possesses a brain of seven, and that with only 300 a brain of only five drams ; to the latter we ought to ascribe the larger brain, and a more ample capacity of registering the impressions made on the organ of vision : for, allowing one dram of encephalon to 100 fibrils, the brain which absolutely is the least, will have a superfluous quantity of two drams, while the larger has one only.

That the eye, which is supplied with a double quantity of fibrils may be a more complete organ of sense, will be readily admitted ; but the remark is inapplicable to the subject in dispute.

XLVII. Having premised that the nerves are larger in the Negro, we infer, by analogy, that his brain is smaller than that of the European.

NOTES

TO

THE GRADATION IN MAN.

NOTE I. In the 36th note to the Botanic Garden, is the following paragraph on Vegetable Circulation.

“ The parts which we may expect to find in the anatomy of vegetables, correspondent to those in the animal œconomy, are, 1. A system of absorbent vessels to imbibe the moisture of the earth, similar to the lacteal vessels, as in the roots of plants; and another system of absorbents similar to the lymphatics of animal bodies, opening its mouths on the internal cells and external surfaces of vegetables; and a third system of absorbent vessels, corresponding with those of the placenta-tion of the animal foetus. 2. A pulmonary system correspondent to the lungs, or gills, of quadrupeds and fish, by which the fluid absorbed by the lacteals and lymphatics may be exposed to the influence of the air: this is done by the green leaves of plants; those in the air resembling lungs, and those in the water resembling gills; and by the petals of flowers. 3. Arterial system, to convey the fluid thus elaborated, to the various glands of the vegetable, for the purpose of its growth, nutrition, and various secretions; the various glands which separate from the vegetable blood the honey, wax, gum, resin, starch, sugar, essential oil, &c. 5. The organs adapted for their propagation or reproduction. 6. Muscles to perform several motions of their parts.

NOTE II. Mr. *Whittaker*, in his History of Manchester, describes five principal sorts of dogs, which he says seem to be natives of the soil: the great household dog, or mastiff; the bull-dog; the greyhound; the terrier; and the large flow hound. The mastiff is mentioned in the History of Henry VII. and just such as is represented upon a coin of Cunobolin. *Claudian* speaks of the bull-dog to the following effect:

————— the British hound,
That wrings the Bull's big forehead to the ground.

And *Lymachus*, a contemporary of *Claudian*, describes the amazement of the Roman people at seeing some Irish bull-dogs produced in the circus. *Martial* mentions the greyhound; and *Oppian*, who lived in the time of *Severus*, describes the terrier as a native of this isle. The large flow hound, called the southern, or Manchester hound, is described by *Shakespeare* in his *Midsummer Night's Dream*, two centuries ago. It deserves to be noticed, therefore, that after the lapse of so many generations, and considering the free intercourse of dogs, and the number of mongrels that must have been produced, still the different kinds remain entire, and distinctly characteristic.

NOTE III. The natural history of the Polypus is in itself so curious, and at the same time so well calculated to support the opinion maintained in this paper, that we thought the following account from Mr. *Smellie* would be very proper. He says, "In a word, nature
" in the structure and functions of animals descends, by degrees almost
" imperceptible, from man to the polypus: a being which, ever since
" its properties were discovered by Mr. *Trembley*, has continued to astonish both philosophers and naturalists. The structure of the polypus,
" which inhabits fresh water pools and ditches, is extremely simple.
" Its body consists of a single tube, with long *tentacula*, or arms, at one
" extremity, by which it seizes small worms, and conveys them to its
" mouth. It has no proper head, heart, stomach, or intestines of any
" kind. This simplicity of structure gives rise to an equal simplicity in

“ the œconomy and functions of the animal. The polypus, though it has
 “ not the distinction of sex, is extremely prolific. When about to mul-
 “ tiply, a small protuberance or bud appears on the surface of the body ;
 “ this bud gradually swells and extends; it includes not a young poly-
 “ pus, but is the real animal in miniature, united to the mother as the
 “ sucker to the parent tree. The food taken by the mother passes
 “ into the young by means of a communicating aperture. When the
 “ shooting polypus has acquired a certain growth, this aperture gradu-
 “ ally closes, and the young drops off to multiply its species in the
 “ same manner. As every part of the polypus is capable of sending off
 “ shoots, it often happens that the young, before parting with the
 “ mother, begins to shoot, and the parent animal carries several gene-
 “ rations on her own body. There is another singularity in the his-
 “ tory of the polypus. When cut to pieces in every direction fancy
 “ can suggest, it not only continues to exist, but each section soon be-
 “ comes an animal of the same kind. What is still more surprizing,
 “ when inverted, as a man inverts the finger of a glove, the polypus
 “ seems to have suffered no material injury, for it soon begins to take
 “ food, and to perform every other natural function. Here we have
 “ a wonderful instance of animal ductility. No division, however mi-
 “ nute, can deprive these worms of life. What infallibly destroys
 “ other animals, serves only in the polypus to multiply the number of
 “ individuals. M. *Trembley*, in the course of his experiments, discovered
 “ that different portions of one polypus could be engrafted on another.
 “ Two transverse sections brought in contact, quickly unite and form
 “ an animal, though each section belongs to a different species. The
 “ head of one species may be engrafted on another. When a polypus
 “ is introduced by the tail into another body, the two heads unite and
 “ form one individual. M. *Trembley* gave scope to his fancy, and by
 “ repeatedly splitting the head and part of the body, formed hydras
 “ more complicated than ever struck the imagination of the most ro-
 “ mantic fabulist.”

NOTE IV. Since writing the article concerning the Chimpanzee, I have seen the Report of the Directors of the *Sierra Leone* Company, at p. 164, of which is the following observation; which for its authenticity and importance merits a place.

“ To the article of quadrupeds should be added the Japanzee or Champanzee, common in the mountains: an animal more nearly related to the human race than even the Ourang-outang. Of two that were brought alive into the colony, one died soon; the other being older, lived some months. He was nearly two feet high; but those that are full grown are nearly five feet in height. He was covered with black hair, long and thick on the back, but short and thin on the breast and belly; his face was bare; his hands and his head bore the greatest resemblance to the hands and head of an old black man, except that the hairs on his head were straight; he ate, drank, and slept, and sat at table, after the same manner as a human being. At first he crawled on all fours, always walking on the outside of his hands; but when grown larger, he endeavoured to go erect, supporting himself by a stick, which he carried in his hand. He seemed to be of a melancholy disposition, but was always good-natured, doing no person any injury. This species of ape, although not entirely unknown in Europe, has usually been confounded with that of other apes.”

NOTE V. “ In this collection (of comparative anatomy) we find an attempt to expose to view the gradation of nature, from the most simple state in which life is found to exist, up to the most perfect and most complex of the animal creation, — man himself. By the powers of his art this collector has been enabled so to expose and preserve in spirits, or in a dried state, the different parts of animal bodies intended for similar uses, that the various links of the chain of perfection are readily followed, and may be clearly understood.

“ The subjects are arranged in four classes. First, Parts constructed for motion. Secondly, Parts essential to animals respecting their own internal œconomy. Thirdly, Parts super-added, for purposes connected with external objects. Fourthly, Parts for the propagation of the species, and maintenance or support of the young. In each of these classes he has procured and digested a multitude of particulars which are disposed of in the order of gradation, beginning with the most simple, and advancing, by degrees, to subjects of a more complex organization.”

Home's Life of Mr. John Hunter.

NOTE VI. Amongst several well-authenticated particulars which have come to my knowledge, evincing a considerable degree of rationality in Parrots, is the following:—A respectable dyer in Manchester has for fourteen years been in possession of a parrot which I have seen, and heard speak, of which he gave me an account to the following purport. When hungry, she says, “ Is there nothing for Poll? Give Poll a bit, Jacky, give Poll a bit.” And if attention be not paid to her entreaties, she raises her voice, and cries, “ What the devil, is there nothing for Poll? On hearing the voice of a Mr. M——, who is in the habit of calling at the house, she immediately cries out, “ Well, Mr. M——, how are you? What news?” and then laughs heartily. To the dogs she will call out “ Turk, Turk—Juno, “ Juno—hic Turk, hic lad, hic rat, shake him there, shake him.” If they attempt to annoy any passengers, she will cry “ Come here, “ Sirrah! come here, Turk! D—n you, come here!” To the poultry she will call, “ Chuck, chuck;” and when assembled about her, she will raise her voice, and say, “ Shoo, shoo,” and fright them away again. To the cat she will call out, “ Puss, Puss, poor Puss,” &c. As soon as she can hear the noise of the cart, and long before she can see it, she begins to call the horses by their names. “ Come White-foot, come Peacock; come lad, come—back—whoop—back—haw.” When her master is scolding the servants in the dye-house, she runs

over her whole vocabulary of words with great rapidity; jumps upon her perch and down again, shakes her head, and evincing many symptoms of extreme agitation, cries "Cannot you mind your business, "G—d d——n you." In a morning she will say, "Take Poll out;" and when it rains, or the day begins to close, she will call out, "Take "Poll in." This extraordinary Parrot will laugh, sing, and cry.

NOTE VII. Mr. *Hunter's* collection of skeletons, both human and comparative, is, I am informed, the most complete ever made. As it seems he had paid some attention to the subject of comparison, it is to be wished he had left us his opinion in writing; or that some person acquainted with them, would favour the public on that head. In the back ground of an elegant engraving of him by Mr. *Sharp*, from a portrait taken by Sir *Josbua Reynolds*, there is delineated six of those heads: a circumstance in some measure indicating his ideas of gradation.

N. B. Since writing the above, the author has seen Mr. *J. Hunter's* Life, by *Everard Home*; prefixed to his "Treatise on the Blood, Inflammation, and Gun-shot Wounds," just published, from which some extracts have been made. See Note V.

Dr. *Soemmering* says, "In one of my negro skeletons I found six "vertebræ of the loins. The number of the other vertebræ was "complete: this I have more than once found in Europeans." Dr. *Marshall*, Lecturer in Anatomy in London, informs me that he found six vertebræ of the loins in a negro, and as many in a negress; but that he never saw more than five in an European. Dr. *Monro*, Professor of Anatomy at Edinburgh, informs me that he never found more than five vertebræ lumborum in the human species in this island; but he was shewn some skeletons at Berlin, which were said to have been the first King of Prussia's regiment of Giants; and which appeared to have six vertebræ lumborum; but he suspected there was some trick in it.

Suc, in his *Traité d'Osteologie*, says, "J'ai vu plusieurs fois six vertebres de lombes, & particulièrement dans les fujets qui avoient au deffus de cinq pieds huit pouces."

These are all the accounts I have been able to collect, of more than five *vertebræ lumborum* being found in the human species. Nothing decisive concerning gradation can be drawn from them, because the number of *vertebræ* are very uncertain in *Simiæ*. Dr. Tyfon's pigmy had five *vertebræ lumborum*. Monkeys have been found, some with six and some with seven.

NOTE VIII. The *Albinos* of Africa have hair much whiter than ever was seen upon an European, with the same curl and woolliness as other Africans. The same may be said of those who are dappled, black and white, in those parts of the skin which are of a white colour; but where the skin is black, the hair is black also.

A negro, who was born in Jamaica, and who, on account of a peculiarity, was shewn along with some wild beasts in Manchester, had a large white blotch upon the top of his head and his forehead, extending from the crown of his head to his nose, three or four inches broad. Upon the top of his head, where the skin was white, the hair was white, curled, and woolly; upon the other parts of his head the hair was black, curled, and woolly. The colour of the skin upon the forehead was similar to that of an European skin, the carnea colour, not that dead white which I have seen in *Albinos*. Those parts which were black, were of a jet black, or nearly so. He was a very handsome negro; had no *frænum præputii*; he said his skin was dappled from his birth; at least he could not remember it otherwise.

NOTE IX. A person skilled in numbers, has favoured me with the following theorems, which will serve to shew the effects of free and indiscriminate marriages of whites and blacks, provided their offspring, in whatever degree of descent, were alike prolific.

“ Suppose a colony of whites and blacks of equal numbers, and the
 “ white men married blacks or whites indiscriminately, and that one
 “ thirtieth of the whole number were born and died annually; then
 “ we obtain these theorems:—

“ $\left(\frac{59}{60}\right)^m \times W$ = the number of Whites remaining after the expira-
 “ tion of m years; W being the whole number of
 “ Whites at first.

“ $\left(\frac{59}{60}\right)^n B$ (or W) = the number of Blacks; B being the number
 “ at first.

“ $\& 1 - 2 \cdot \left(\frac{59}{60}\right)^m \times$ = the Mulattoes, or people neither absolutely
 “ black nor white.”

“ According to these, in 65 years the number of Blacks, Whites, and
 “ Mulattoes would be equal. In 91 years the Whites would be $\frac{1}{10}$,
 “ the Blacks $\frac{1}{10}$, and the Mulattoes, or people of intermediate degrees
 “ of colour, $\frac{8}{10}$ of the whole number. In three centuries not $\frac{1}{100}$ part
 “ of the Whites would exist.”

THE END.

NOTE IX. A person killed in number, has favoured me with the
 following theorem, which will serve to show the effect of the
 indiscriminate marriage of whites and blacks, provided the
 in a shorter degree of time, were all the people.

2, 2, 1

11/2

4 in g. 1 in

And
g. 8 in
W 11



