New views on baldness : being a treatise on the hair and skin / by H.P. Truefitt.

NEW VIEWS ON BALDNESS;

BEING

A TREATISE

ON

THE HAIR AND SKIN.

BY

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PREFACE.

We purpose in the following work to furnish the public with a readable and a concise summary of the physiology and pathology of the scalp and of the hair. We are induced to do so by several urgent motives. We have long wondered, that interesting to so many as are the subjects herein comprised, no work of moderate pretensions has yet issued from the pen of a practical trichologist. That details upon these subjects sufficiently exact and scientific can be found in books, we of course do not deny; but the information these include is, as far as the general reader is concerned, altogether inaccessible. The anatomist treats in *his* work, of the tissues of the scalp, of the structure of the hair; the physiologist dilates upon the purpose these respectively subserve in the economy; the physician considers their diseases, and endeavours to point out the main

features for the mitigation of these latter: but the knowledge so imparted by all is special and technical. It is either too diffuse, except for the professional reader; or too scanty, except for those already well versed in general principles. It results consequently, that the public at large knows far less of the subject—hair and its losses, its diseases, its congenital and derived peculiarities, than it does of like matters relating to the stomach, or the liver, or even the nervous system. But an additional incentive to the issuing of the present treatise has concerned ourselves personally in a more immediate manner. We have, by an experience of many years and of many thousand cases, made ourselves exceptionally familiar with abnormalities of the scalp and hair, and derived from the treatment of these, peculiar views of our own, which could scarcely find convenient expression through any other medium than the present. For the correctness of these views we appeal with confidence to the success that has attended the treatment based upon them; and that they are in harmony with the present advanced state of physiological knowledge, we believe will be readily conceded by the candid practitioner.

We shall, therefore, in the following pages, present the reader, firstly, with some chapters on the structure and functions of the scalp and its appendages. Without this preliminary knowledge of healthy structure and function, it must evidently be vain to discuss those deviations from the former which, either hereditary or acquired, constitute abnormalities, and those perversions of the latter which make up disease. Such knowledge, however, obtained, we shall in the remaining portion of the work proceed, and we hope with profit, to the consideration of those diseases themselves. Directing our attention very especially to Baldness, we shall seize the opportunity for enunciating the views we have alluded to, and for stating in simple and untechnical language the scientific principles on which these views have been framed; not disdaining, whenever an opportunity shall present itself, to put before the reader any points of anecdotical and general interest, which in our opinion may not be altogether irrelevant to our subject.

CONTENTS.

ON THE HAIR AND SKIN.

CHAPTER I.

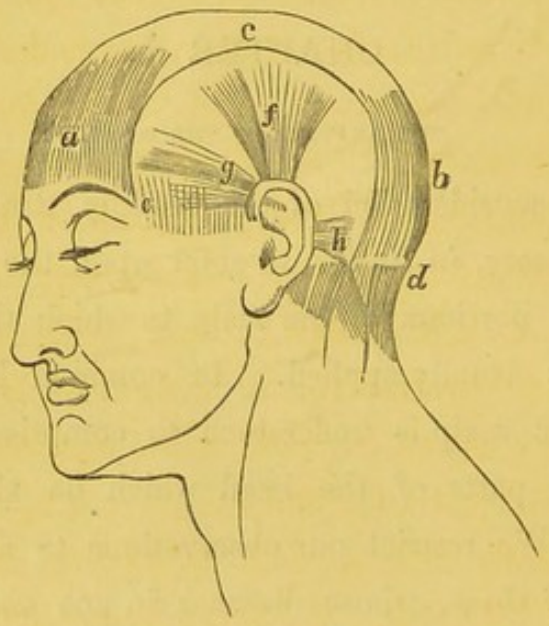
THE ANATOMY OF THE SCALP.

In the consideration of the healthy structures, it is necessary, *in limine*, to enter upon the anatomy of such portions of the scalp to which the prefix *hairy* is usually applied. In common language, the term scalp is understood to comprise all the external parts of the head which lie above the skull. We restrict our observations to such portions of these, whose diseases do not enter more especially into the province of the dermatologist. To treat of the entire scalp, would necessitate our dealing with subject-matter with which as *trichologists* we are but remotely concerned.

The hairy scalp is made up of skin, and cellular tissue, and fat. Beneath the skin are the muscles that move it, and superficial to those are the

vessels and nerves that supply it with nourishment, and endow it with sensibility.

The muscular layer of the scalp varies much in thickness at different portions. The vertex of the skull presents little or no muscular fibres, but the sides and vertical portion of the skull bones are covered in by the bellies of more than one



MUSCLES OF THE SCALP.

a. Anterior belly of the occipito-frontalis.
b. Posterior belly.
c. Tendon of occipito-frontalis.
d. Occipital protuberance.
e. Fascia covering the temporal muscle.
f. Attollens aurem.
g. Attrahens aurem.
h. Retrahens aurem.

muscle; muscles which elevate the eyebrows, move the ears, and assist in mastication.

The first of these is the occipito-frontalis. This

muscle covers the whole vertex of the skull from back to front. It extends from the eyebrow to the bony protuberance that may be felt at the back of the head, and which, from below, gives insertion to the thick muscles at the back of the neck. The frontal portion of the muscle is fleshy, and so, likewise, is the occipital part. But the intermediate portion is formed by a broad, flat, and thin tendon. The muscles of the right and left sides unite by this tendon or aponeurosis in the median line, and the whole muscle thus formed is very closely adherent to the integument, and indeed, may be removed with it, unless, on dissection, the skin be separated with care. The connection of the occipito-frontalis with the bone, is, except at the origin and insertion above described, of a less intimate nature. The muscle and the skin can consequently glide at will, freely over the skull beneath. By fixing the attachment in front, the scalp at the back of the head may be moved; and similarly, by fixing the posterior attachment, the muscle and attached integument may readily be made to glide over the frontal bone. In some persons where the attachment to the cranium is even less intimate than usual, this capacity for moving the scalp may be very readily observed.

The sides of the skull are abundantly furnished with muscle. If the teeth be clenched firmly while the fingers are applied to the region of the temples, the bellies of the temporal muscles may be felt contracting firmly. Inserted into a process of the lower jaw, the temporal muscle rises on each side, partly from the depressed and lateral part of the skull, and partly from a fibrous glistening fascia that stretches across the space intervening between the front and back portions of the occipito-frontalis already described. Superficial to this temporal fascia, again, are to be found in most subjects three muscles very intimately connected with the skin. They are respectively the *attrahens aurem*, the *attollens*, and the *retrahens aurem*. The first two take their origin from the aponeurosis of the occipito-frontalis; the latter arises from the knob of bone that can be felt behind the ear. They are all inserted into the ear and produce its motions when these take place. In man these are very restricted; but in animals they are not unimportant, as may very well be observed in the case of the horse.

Such, then, are the muscles of the scalp, and the tendinous expansions connected with them. Beneath these, and between them and the bones, there

is nothing but some cellular tissue, and the dense fibrous membrane which covers the skull in common with all other bones. But between them and the skin, and ramifying in the sub-cutaneous fat—supplying both the muscles we have named, and the integument which invests them—are to be found arteries, veins, and cutaneous nerves.

The external carotid artery furnishes the main supply of arterial blood to the scalp. The internal

ARTERIES OF THE SCALP.

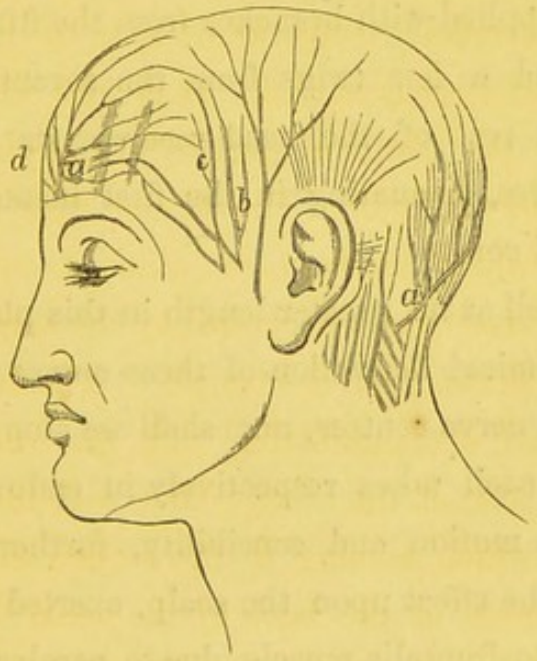
a. Supra-orbital artery.
b. Superficial temporal artery.
c. Anterior division of the superficial temporal.
d. Posterior division of the superficial temporal.
e. Occipital artery.

carotid artery likewise furnishes some not inconsiderable branches, but these are neither so numerous nor so important as those derived from the former source.

The *internal* carotid artery gives off to the orbit a branch called the ophthalmic, of which two subdivisions on their emergence from that cavity are distributed freely to the scalp. These are the supra-orbital and frontal arteries. Their distribution is principally to the forehead: the latter emerging from the orbit in the angle by the nose, and the former, in company with a nerve of the same name, from a hole in the bone under the eyebrow. The ramifications of both of these vessels inosculate freely with those of the following, which, we have said, are derived from the *external* carotid.

The superficial temporal artery is the last branch from the external carotid. It divides on the fascia covering the temporal muscle into an anterior and a posterior division. The former runs tortuously to the scalp of the forehead, which it supplies, and is the vessel which is opened by the surgeon when blood is drawn from the temple. The latter is the larger, and, communicating with the artery of the opposite side of the head, blends with the occipital artery,—which, coming to the surface through the thick muscle at the back of the neck, soon subdivides, supplying the scalp, the occipito-frontalis muscle, the ear, and the bones. The veins correspond to the arteries; but a fuller description is required of the nerves.

We shall have occasion to dwell, at some length further on, upon the minute structure and functional attributes of the delicate nervous threads that ramify in so intricate a manner over the whole of the surface of the body. In this place, we have but to observe for our present purpose, that—not taking into consideration the supply of nerves to the organs of the body—nerves are distributed either to the muscles or to the skin. In the former case, they are subservient to the contractility of muscle, and are termed *motor* nerves. In the latter case, they impart sensibility to the surface, and are



NERVES OF THE SCALP.

a. Occipital nerve.
b. Facial or seventh nerve.
c. Its temporal branches.
d. Supra-orbital nerve.

consequently termed nerves of sensation, or *sensitive* nerves. The scalp is furnished with both these varieties. Its muscles receive nerves of motion. Its integument is supplied with nerves of sensation. The motor nerves are mainly the terminations of nervous trunks whose origin is in the spine. The nerves issuing from the brain are mainly instrumental in sensation, with the exception of the branch of a nerve termed the facial nerve, and that from another nerve coming from the brain itself —the infra-maxillary nerve. In general terms, we may say that the half of the scalp in front of the ear is supplied with branches from the fifth cranial nerve, and a few twigs from the seventh nerve; while the rest of the head receives its branches from nerves, emanating in the first instance from the spinal cord.

We dwell at no greater length in this place upon the anatomical derivation of these nerves in their respective nerve centres, nor shall we stop to trace the share each takes respectively in endowing the scalp with motion and sensibility, further than to instance the effect upon the scalp, exerted through the occipito-frontalis muscle, due to paralysis of the facial or seventh cranial nerve, which we have found to supply it. Where injury to this nerve has been

sustained, the greater number of the muscles of the side of the face lose all power of contracting under the influence of the will. The face is drawn to one side consequently, by the unopposed action of the muscles of that side. The muscles of the injured side become flabby and useless, and a consequent inability exists to perform those muscular movements which combine to produce in the natural state the endless play of the features in response to the voluntary or involuntary workings of the brain. With regard to the occipito-frontalis in particular, palsy of the seventh nerve deprives the muscle of function. The patient is consequently unable to frown. The skin of the forehead and skull remain altogether motionless, not unfrequently leading the physician to detect and localize the cerebral injury.

To resume, then. The scalp is moved by subjacent muscles, nourished by ramifying vessels, and endowed with sensation through the nerves that permeate all its tissues. The arteries are branches of the two great arterial trunks—the internal and external carotids. The nerves are derived from branches issuing both from the brain and spinal cord, and endow the muscles with contractile

power, and the skin with sensibility. The muscles are the *occipito-frontalis*, the *temporal*, and the three muscles of the ear. Covering all, and laying as a cushion, both above and below the muscular layers, is firstly the skin, and next the cellular and fibrous tissues and the fat,—which we shall now proceed to describe.

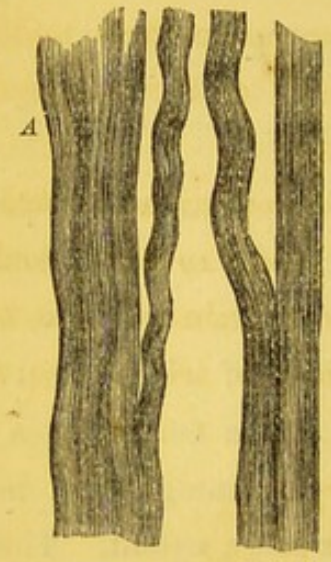
CHAPTER II.

ON THE FIBROUS, AREOLAR, AND ADIPOSE TISSUES OF THE SCALP.

BEFORE proceeding to the skin, which will require a complete investigation, we have to afford some few particulars with respect to certain tissues existing in the scalp, and the nature of which must be accurately known in arriving at a correct idea of the anatomical structure of the integument, into which these tissues enter to a large extent. These tissues go by the names of fibrous tissue, areolar tissue, and adipose or fatty tissue.

Fibrous tissue appears to the eye to be made up of so many bundles or fibres, which indeed are themselves constituted by smaller threads or fibrillæ, capable by delicate manipulation of being indefinitely split up lengthways. The texture may be well characterized by the appearance it presents, such being essentially fibrous. But fibrous tissues are not all similar, either in physical or chemical properties. The white of the human eye for example, is formed of *white* fibrous tissue ; but the rings of the windpipe (which may

be felt by the finger) are constituted of *yellow* fibrous tissue. The white fibrous tissue we have



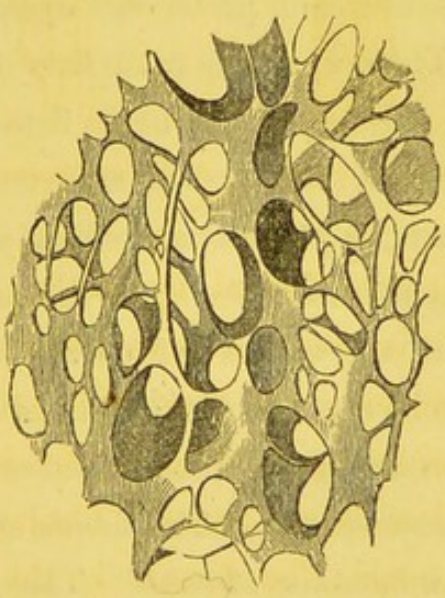
A. White fibrous tissue magnified.

B. Yellow fibrous tissue magnified.

seen to be as it were formed by parallel threads—these assume, it is true, a somewhat wavy character in small specimens; but they have no tendency to curl themselves up, and to subdivide like the bundles of yellow fibrous tissue. The latter variety is the more elastic; the former is the stronger. The white fibrous tissue is consequently employed to connect tendons with bone; the yellow to serve for cushions between surfaces, of which a familiar example presents itself in gristle. Strong acetic acid removes the wavy appearance of the

longitudinal white fibres, but has no influence on the yellow. Gelatine may be extracted by boiling from white fibrous tissue, but scarcely, if at all, from the yellow variety. The appearances under the microscope of the two kinds of fibrous tissue may be observed in the drawings.

Mingled together in various proportions, according as either great strength or elasticity is required, the two kinds of textures here described constitute what is termed *areolar or cellular tissue*, one of



AREOLAR TISSUE MAGNIFIED.

the most extensively diffused of all structures. Its principal use is evidently the connecting of the several parts of the body in such a way as to permit great freedom of motion. By means of

areolar tissues the several vessels of the scalp, at the same time that they are fixed in their position, are yet enabled to undergo the movements to which they are exposed by the muscles, or by alterations in the circulating powers. In the muscles, this areolar tissue both connects the fibres altogether, and preserves them from undue separation during contraction; and briefly, may be said to exist throughout the body in greater or less profusion, according to the extent to which motion of neighbouring parts one upon the other is required. Thus, upon the scalp it is found freely investing the surface of the bone, between it and the tendons of the occipito-frontalis muscle; and, as in other parts, is present immediately under the skin, in company with the granular fat, and the ramifications of the vessels and nerves.

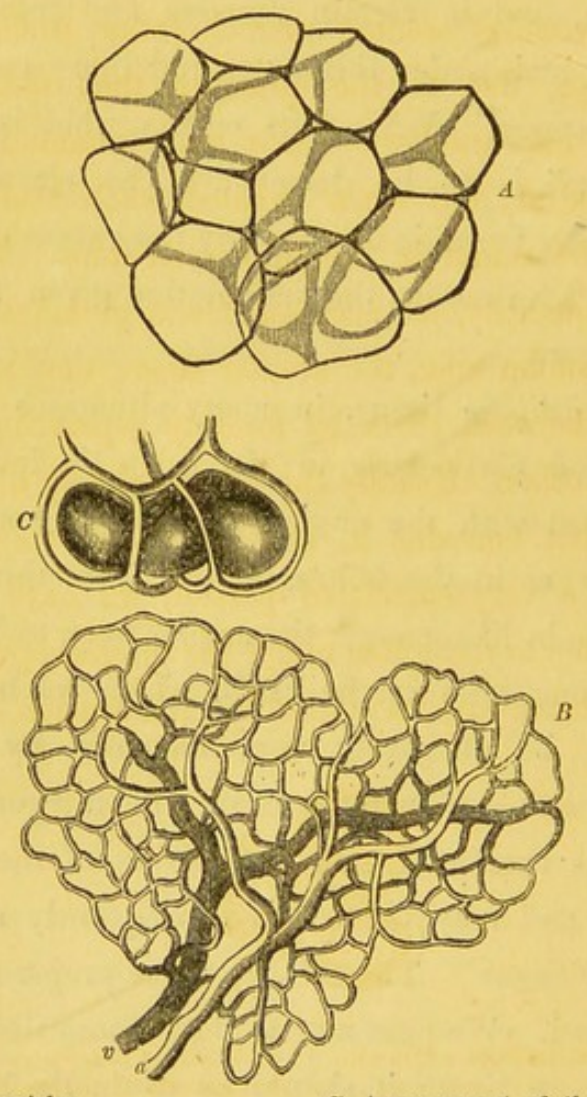
When a small fragment is examined under the microscope, an inextricable interlacement of bands and fibres is readily seen. The *bands* are inelastic, and present numerous streaks. The *fibres* are long and branching filaments, which are very prone to curl when not put on the stretch. These respective white and yellow elements leave innumerable interstices between them as they twine among each other; and it is to the presence of

these spaces, or so-called cells, that the tissue is indebted for its name, and mainly for its elasticity. It contains a large quantity of water in its composition, and in certain diseases and injuries of the hair and scalp, this water undergoes considerable increase. When this occurs, what is called "pitting" is to be detected. The elasticity of the areolar tissue is impaired by the excess of fluid, and the skin retains the indentation given to it by the finger.

The *adipose* tissue, in many situations of the body and particularly in the scalp, is intimately associated with the areolar tissue. It may exist however, as in the bones, distinct from this structure; as in like manner the areolar may, as beneath the aponeurosis of the skull, which we have described, be altogether unaccompanied by fat or fatty tissue. The fat beneath the integumentary scalp is combined with the meshes of the elastic tissue, and may be termed consequently adipose-cellular tissue. The cellular tissue proper we have described. We pass now to the adipose tissue.

Adipose tissue, it should be distinctly borne in mind, is not the fat contained within it. Fat, or the white, unctuous, unorganized substance with which we are familiar, is deposited from the blood

into the interior of minute, transparent, closed sacs, or vesicles, each of which is distinct and independent. The membrane of these vesicles, or adipose



A. Fat vesicles.
B. Blood-vessels of fat.
a. Artery. *v*. Vein.
C. Arrangement of the vessels around the fat vesicles.

tissue, is of extreme tenuity, and has a greater affinity for water than for the fat it contains. Each

little sac is supplied with blood-vessels, and the smallest does not exceed $\frac{1}{800}$ of an inch in diameter. Deposited in large numbers together, the fat vesicles assume various forms under the microscope, due to the pressure they naturally exert on one another. Their most common form is polyhedral; but when isolated, each vesicle is seen to be round in the unpressed state. Where in large quantity, fat accumulates in globules, and, as in common suet, the areolar tissue may readily be seen between them by forcibly separating one from the other. Usually the fat completely fills the vesicle that contains it, but in the fat from the scalp of a very emaciated person, we have been readily able to recognize under the microscope both the membrane and its contents. Absorption of the

A. Fat vesicles from a thin subject.

a. Membrane of the vesicle.
b. Contents of the vesicle.

latter had taken place, and the pellucid envelope was larger than necessary. In warm weather, we have frequently determined the fact of the scalp

being richer in fat than in the winter time, and deduced principles of treatment in accordance with such observations.

Such, then, are the tissues to which the scalp owes its evenness, its roundness, its elasticity, its freedom of motion. By means of the fibrous tissue, the muscles of the scalp seek attachment to the bones, the bones of the head receive their immediate investment, and the sutures of the skull their elastic cement, which, at the same time that it binds them together, allows a certain minute separation by its elasticity, and enables the cranial vault to resist mechanical violence. By means of the areolar tissue, the scalp glides freely over its bony seat; the fibres of the muscles which move the scalp act in harmony and unanimity; the vessels are conducted to the minutest textures they ultimately supply; the nerves to their most delicate ramifications; while, by the interposition of the adipose tissue, the skin of the scalp is supplied with a cushion, the contour of the scalp is rendered uniform, and a reserve of nutritional material is stored up for the hair.

It is now, we trust, thoroughly understood that the scalp itself depends for its physical properties upon the integrity of the areolar tissue and of the

fat. The hair is essentially dependent upon the skin, and this important texture we shall find to be a compound structure, resulting from the presence of both areolar tissue and fat. To consider the functions both of the scalp itself, the skin, and the hair springing therefrom, it is necessary to digress for a short time into the chemical constitution of the tissues already described. It is on a knowledge of the chemical characters of the several tissues that treatment is in great measure based and rendered efficient. An ignorance upon this subject is sure to be attended by mischievous practice; and, indeed, it is evident that chemical as well as anatomical knowledge is alike indispensable in establishing the differential diagnosis at which we aim, when we note the excess or absence of certain characteristics imparted to the several structures by the chemical endowments of each.

CHAPTER III.

CHEMISTRY OF FAT AND ITS BASIS, GLYCERINE.

In the building up of all animal textures, water plays an essential part. Without water, indeed, the vital phenomena the several tissues display could not take place. Sensation, secretion, and growth would be impossible: and even the commoner attributes of extensibility, elasticity, and contractility would cease to exist. We find water, consequently, present in certain proportions in both the white and the yellow fibrous tissues so abundantly met with in the scalp. The fibrous tissues consist mainly of an organic compound with which we are familiar under the name of gelatine.

We pass now to the chemical constitution of fat—a material which is present in the scalp to a considerable extent, and, fulfilling most important offices, preserves and stores up materials for the production of heat, and at the same time affords to the scalp a substratum of great elasticity.

The fat of the scalp is secreted from the blood through the vessels that ramify throughout. It is not secreted indiscriminately, but into the interior of the fat vesicles before-mentioned. It is itself a white and greasy substance, without organization, and of various degrees of consistence. It is a compound of an acid with one or more bases, having, indeed, the essential constitution of a true salt. Thus a common chemical salt, the carbonate of soda, is a compound resulting from the union of carbonic acid with soda. Epsom salt, again, is a compound formed by the union of sulphuric acid and magnesia. Fat is, in like manner, the resulting product of the union of an organic acid (the oleic acid) with glycerine. Fat, typically described, may be spoken of, therefore, as an oleate of glycerine; but certain chemical processes are requisite to obtain this oleate in an isolated form. For, actually, fat is a compound, not only of oleic acid with glycerine, but of other organic acids with this same base, and termed respectively—the stearic and margaric acids. Thus it may be represented in a tabular form:—

Oleic Acid Stearic Acid Margaric Acid	Glycerine.	Oleate of Glycerine Stearate of Glycerine Margarate of Glycerine	Fat.

Glycerine owes its name to its sweet taste. It is a viscid, colourless liquid, one-fifth heavier than water. It is separated from all fatty substances, if we except wax and spermaceti, during the process of saponification, or soap-making. When potash, for example, is mixed with fluid fat and subjected to heat, the acid of the fat unites with the potash, and the glycerine is set free. The oleate of potash forms a resulting soap.

Glycerine, therefore, is not a constituent of soap, though fat contains it in large quantities. In fact, soap owes its detergent properties to the alkali it contains, and its consequent freedom from glycerine, the presence of which in soap must consequently be due to the imperfection of its manufacture. Glycerine is slightly volatile, and when heated in air burns with a more or less luminous flame. It is a curious fact, that nitric acid will convert glycerine into oxalic acid; and that when added gradually to a mixture of sulphuric and nitric acids, it gives rise to an oily liquid of high explosive powers. A drop upon paper struck with a hard substance, detonates with a report which is actually deafening. It is a compound of three ultimate elements—carbon, hydrogen, and oxygen ($C_6H_8O_6$) and may be said to be made up

of water (HO) united with hydrogen and charcoal.

Let us now inquire into the chemical constitution of the acids in union with it. Stearic acid may with care be distilled perfectly pure. It may first be obtained by making a soap of the fat, and then decomposing it as a hot solution by tartaric acid. The resulting acids are separated by ether—which, in cooling, deposits the acid in question in the form of beautiful transparent and colourless rhombic plates. When melted, it has the appearance of a colourless oil, which, on cooling, concretes into a white and crystalline mass, which is insoluble in water. Its acid nature becomes evident on applying litmus paper, which is immediately reddened. Stearic acid, in combination with soda, forms the basis of ordinary hard soap. It was thought that it might be transformed into margaric acid by heating with nitric acid,—but Heintz showed this to be erroneous; margaric acid is said by this authority to be an impure stearic acid. The melting points of the two acids led to their supposed isolations. That of stearic acid is 159°, and that of margaric acid 140°. The apparent difference between the two is by this chemist ascribable to the

admixture with the stearic acid of another acid, called the palmitic.

The third acid found in fat in union with glycerine is the oleic. It is isolated with difficulty, owing to its tendency to absorb oxygen—to which it owes the brown colour presented by most specimens. At the temperature of 40° it is a hard, crystalline mass, which at a heat above 57° forms a colourless, limpid, tasteless, and inodorous oily fluid. Oleate of potash is the chief ingredient in Naples soap.

These three acids are all compounds of carbon, hydrogen, and oxygen, and contain these elements in the proportions set forth in the table :—

	Carbon.	Hydrogen.	Oxygen.
Stearic acid	36	36	4
Margaric acid (impure stearic acid) ...	34	34	4
Oleic acid	36	34	4

Such, then, is fat,—an organic compound, very rich in carbon and hydrogen; occurring in the vegetable as well as in the animal kingdom,—in the former principally in the seed, in the latter beneath the skin. Lighter than water, soluble in ether and oil of turpentine, possessing peculiar properties—not the least remarkable of which is that

of rendering paper semi-transparent — and in animals which are warm-blooded, solid at ordinary temperatures, but fluid in fish and cold-blooded animals. In all cases, whether in the plant or in the animal, it is associated with a containing sac, which contains nitrogen in its composition, and exerts an important chemical influence upon it.

The compounds formed by the union of the fatty acids here mentioned with glycerine, are termed by physiologists, rather than chemists— *stearine, margarine*, and *elaine*,—on the relative proportions of which the modifications of their principal properties are stated to depend. The first two principles are solid; elaine is liquid, and may be separated from its associates by pressure. Not unfrequently, it is possible to note these several principles in the fat vesicle, wherein they may separate spontaneously.

The isolated cells which we have seen to contain the adipose tissue, there can be no doubt, possess the power of absorbing the elements of fat from the blood. All the best analyses of this fluid include fat as its constituent. The blood itself consists of an albuminous or serous fluid holding certain bodies of minute size in suspension, termed corpuscles. According to Lehmann, the corpuscles

contain fat to the amount of 2·31 parts in 1000: while the *liquor sanguinis* contains that substance to the amount in 1000 grains of 1·72. When fat accumulates in the blood, the serum assumes a milky aspect, and forms a creamy film on standing. Monsieur Blainville tells us that the blood which issued from the wounded jugular vein of an elephant he dissected at Paris, deposited a considerable quantity of a fine substance, which was found on analysis to have the same composition as ordinary fat. The fatty matters present in the blood are not altogether directly traceable to the ingested materials. Fat is, of course, taken into the system through the mouth in large quantity; but the excessive development of adipose tissue in persons who restrict themselves to the simplest diet, clearly proves that there is in the system an inherent power of manufacturing fat from alimentary principles of a nature apparently dissimilar. It is moreover apparent, from the rapid wasting of this substance when the system is deprived of food or reduced by fever, and the enormous consumption of it as an article of diet by the inhabitants of the northern latitudes, that fat subserves a more important office in the cycle of nutrition than would at first sight be surmised. The manufacture of fat is not diffi-

cult to understand. We have seen it to be chemically a compound of carbon, hydrogen, and oxygen. Now there is a large group of alimentary principles which are likewise made up of these three elements, and of these three elements only. Such are the sugars and the starches, the several kinds of gum, and the alcohols. By the separation from any of them of a small proportion of oxygen, fat is produced. An equivalent of starch, for example, changes into one of fat by the loss of an equivalent of carbonic acid (CO_2) and seven equivalents of oxygen.

The deduction from this view is, that where, for the purposes of general nutrition, oxygen is required, and is not provided to the system in sufficient quantity by the process of respiration, it is forthwith taken from the carbonaceous alimentary principles, and fat is accordingly formed. The foods rich in carbon we have said are the sugars, the starches, and the alcohols. If either of these be taken in excess, and the lungs are not proportionately called into activity by exercise, the oxygen is taken from them, and fat forthwith accumulates. Individuals, therefore, of sluggish habits become fat as a matter of course, for they take but little oxygen into the system. We here again perceive

how it comes to pass that beer-drinkers get so fat. They take a considerable amount of starch into the stomach, and a large quantity of alcohol and sugar—any one of which substances readily transforms into fat under the conditions we have mentioned.

That an accumulation of fat may be looked upon, *cæteris paribus*, as evidence of debility we have long believed, agreeing as this view does with the results of our own experience. We have in a very large number of cases—so large, indeed, that we can scarcely call to mind an exception—found a loss of the hair preceded by an unusual excess of fat among the tissues of the scalp. The denuded scalp has in the vast majority of cases a soft and highly-elastic feel, due to the abundance of this material; and common observation must have impressed every reader with the fact, which is of far too frequent occurrence to partake of coincidence, that fat people as a rule have but little hair. In prisons and ill-regulated work-houses, fat accumulates among the inmates rapidly, even though they be fed on the simplest food; and a thick head of hair is but seldom seen among such people. Fat, in fact, evidences debility, and to a certain extent is evidence of that modified condition of the nervous

system which displays itself in the scalp in that perversion of its function which ministers to growth.

As connected with the hair, fat, nevertheless, in normal quantity plays a most important part; for we find that wherever hair grows upon the surface of the body, it is over a certain amount of subcutaneous fat. Thus in the axilla fat is plentiful; so likewise is it in the pubic region, and about the orifice of the gut. We shall see when we come to the subject of the hair, that this structure is rich in carbon; and it must, we feel satisfied, be admitted that the fat in these regions is mainly destined to be a reservoir for the supply of carbon to the growing hair.

In addition, moreover, to its forming a cushion for the scalp proper to play upon, the fat of the scalp contributes of course its own share, when called upon, to the maintenance of animal heat.

It is to Liebig we owe the view now universally received, that the temperature of the body is due to the collective heat given off during the union of oxygen, principally derived from the air in respiration, with other chemical elements—the chief of which is carbon. When carbon is deficient in the food, this element is abstracted from fat,—for though fat is a necessary material for preserving

the integrity of the body as a whole, it is not so indispensable as heat. To keep up the heat, therefore, by means of the combustion of carbon, the fatty matters must, when food is deficient, pass again into the blood. We have no certain knowledge how this is accomplished, but we may frame an hypothesis which is perhaps not far from the truth. The blood usually, as we have said, contains a certain amount of fatty matter, held in solution by alkali; when the former is exhausted, the alkali becomes proportionately in excess, and the blood is thereby enabled by the alteration in its specific gravity, as compared with the specific gravity of the interior of the fat cells, to draw the contents of the latter into itself.

We trust we have shown that a knowledge of the physical and chemical characters of the fibrous tissues and fat of the scalp plays no mean part in the therapeutics of the hair. It is only the most reprehensible ignorance that could attempt to remedy the affections and deficiencies so frequent in the scalp, when unmindful of the complicated organization, the compound properties, and the subtle chemical constitution even of these subsidiary structures.

CHAPTER IV.

THE PHYSIOLOGICAL AND ANATOMICAL HISTORY OF THE SKIN.

We shall hereafter find it requisite to describe, more minutely than hitherto it has been necessary to do, the ultimate structure and chemical composition of the nerves which ramify both throughout the scalp and generally throughout all the vital textures that cover the bone. We proceed now, however, to enter upon the physiological and anatomical history of *the skin*, whose nature is so little apprehended by the public, whose functions are so little understood, and are certainly almost universally neglected.

It would seem surprising, that devoting so much attention to the innermost recesses of the human economy, to the irregularities of the organs remote from their knowledge and experience, the public should not only never concern themselves about the skin, but should rarely ascribe any indisposition to a failure in its functions. A patient of our own applied to us but a short time back for

a remedy to allay the distressing itching caused by the *pediculus vestimenti*, which had so acclimatized itself to the scalp, that there was scarce a hair without its parasite. As gently as we could, we insinuated the suspicion that a little soap and water would not be ineffectual. "Soap and water, sir!" said the itching patient, "what can soap and water do for my liver, I should like to know?" The truths of medicine are not always hidden in wells: a fact, the cognizance of which would have saved this person from the common error of seeking so deep for the cause of an evil, which in this case, as in most cases, lies merely *at the surface*.

But apart from the fact that many diseases of the scalp, many losses of hair, can be traced to the score of the skin, and that a knowledge of the skin is therefore imperatively called for, such knowledge becomes more indispensable when we reflect that our remedial agencies must be framed to harmonize with its texture, and that treatment directed to the hair must in no wise act to the detriment of the skin from which hair proceeds, and by means of which it grows and persists. Further, there are many local diseases characterized, as we shall by-and-by discern, by the presence of certain vegetable sporules, intimately dependent upon the

previous manifestation of what physicians term the scrofulous diathesis. Now, without an acquaintance with the structure and functions of the skin, we should be at loss to treat such affections, susceptible of mitigation as these are, mainly through processes and remedies directed towards it. One affection of the hair, for example, termed pityriasis (the dandriff), is not so much an affection of the hair as of the skin itself; to which, if treatment be not directed, no remedies will be effectual to remove.

We may be pardoned, moreover, in observing, that a knowledge of the skin is still less dispensable with regard to the administration of internal remedies. The skin envelopes the entire outer surface of the body; but it also extends like a sheet through the body itself, in the form of *mucous membrane*. The skin at the margin of the lips we can see changes suddenly from white to red. This different appearance does not indicate, except in a popular sense, the cessation of the skin, but a change in the arrangement of its constituents, and the proportions of them respectively. The sanguineous element, from the redness of the lips, is plainly seen to be more abundant in mucous membrane than in skin

properly so called. In like manner, the nerves are more sensitive; the outermost layer is reduced in thickness; but the texture remains skin, modified though it be, and is in reality skin, through the entire length of the intestinal tract.

Stretching then over the surface of the body is this vast sheet of living texture. In some situations thick, in others thin; in some unimpressionable, in others acutely sensitive; in some pale, in others reddish, or dark. The skin, marked by furrows, furnished with hairs, bedewed with perspiration, and originating the nails, is the largest organ of the body.

We term the skin an *organ*, and that it is so, we see at a glance, in considering the uses to which it is subservient. A ready receiver of impressions, it is the organ of touch, and sensations of contact; moistened with perspiration, it is the organ which secretes it. And perhaps it is not even so simple an organ as others which *à priori*, seem to have a stronger claim to the title. The heart is an organ of circulation; it propels blood. The liver is an organ of secretion; it manufactures sugar and bile. But the skin as a whole organ, not only produces perspiration, but the nails; and not only serves as a medium

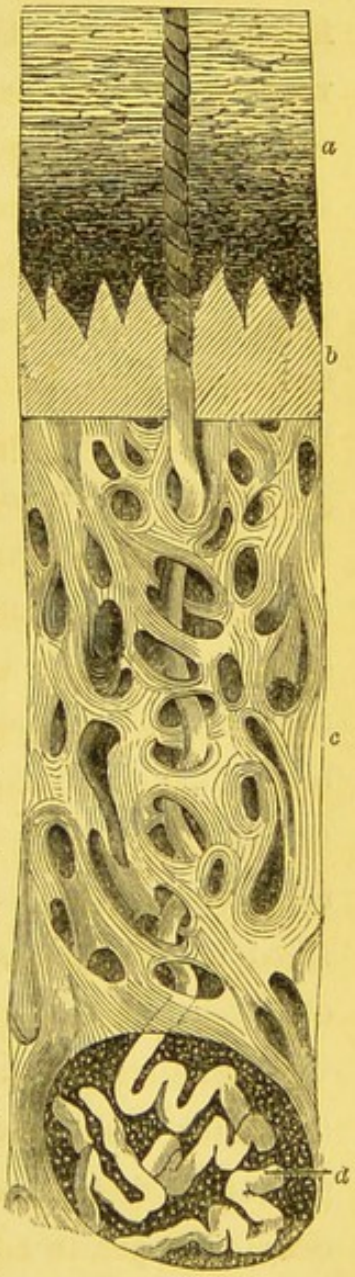
of sensation, but acts as a tunic to the invested structures, and gives warmth and beauty to the body.

It will be seen that under the collective term skin we include those minute organs which form the sweat, and which usually are held to be distinct from the integument. In a philosophical sense, we believe, however, we are correct in so including these glands. For, reduced to their simplest expression, these are but involuted portions of the integument, modified in structure in conformity with the office designed, through such involution; and in a physiological sense, the glands of the skin may as reasonably be held to form a part of the skin as the glands of the intestine to be parts of the mucous tract. In the intestinal canal we perceive that such glands become modified in structure and function, according to the part of the membrane in which they are found; and in like manner, we shall see that the skin varies in appearance, according to the abundance or deficiency of such glands, and of other accidental elements of it.

Looking at the skin from its simplest point of view, we perceive it to consist essentially, like its continuation, the mucous membrane, of a sheet of

what has been termed by Mr. Bowman, *basement membrane*, and certain other tissues superadded made up of those elementary structures we have before described. Underneath the basement membrane are vessels, nerves, and areolar tissue; above the basement is what is termed the epithelium. Now, just as skin and mucous membrane differ in the respective amounts and arrangements of the tissues lying above and below the basement membrane, so certain varieties of skin present themselves, differing from each other in similar respects. The sense of touch, for illustration, we may mention does not exist throughout the whole of this muco-cutaneous system. Food is not felt beyond the point where it is swallowed. On the other hand, where it is essential for protection that feeling should convey the idea of contact, we have the sense of touch. The existence of touch at any part of the system requires, and calls into existence, an increase and transformation of the epithelium lying above the basement membrane, and of the areolar tissue that lies beneath it. We must carefully distinguish between common sensation, and the special sense, touch; where the latter exists, we get, in addition to the structures alluded to, a development of organs peculiarly fitted to

receive impressions of a tactile nature, which are termed *the papillæ*. In the tongue, for example, the papillæ actually project from the surface of the membrane; here they are both mucous and highly developed. In the back, on the other hand, these organs are nearly absent. These papillæ are therefore non-essential portions of the skin. The skin itself being made up of the basement membrane, the epithelium above or epidermis, and the tissue below, or cutis vera.



Reference to the subjoined wood-cut will give a clearer idea of the anatomical disposition of those several parts than perhaps the most elaborate description. At *a* we have the surface of the skin, at *b* the papillæ or organs of special sense, at *c* the deep surface of the skin or cutis vera, at *d* is a sweat gland,

embedded in globules of fat, and from it may be seen the sweat duct passing vertically through cutis, papillary layer, and cuticle, to the free surface of the integument. The nerves and blood-vessels are not represented.

For our own special purposes each of these constituents requires more detailed mention. If we look at the engraving, we see that the artist has depicted in the epithelial stratum (*a*) successive series of particles which differ both in size, in form, and in colour. Resting upon and between the papillæ are minute dark bodies or granules, which aggregated together make up the structure, (which is, it should be borne in mind, a portion of the cuticle) termed the *rete malpighii.* This is the most recently formed and the deepest portion of the epithelium. Above these aggregated granules we find *cells*, which, of a roundish form where adjacent to the "rete," assume a more or less flattened appearance towards the surface. The walls of the cells are transparent, and through them the granules may readily be seen. These cells it is easy to understand are more and more compressed as the surface is approached, and at and near this position the cells, under a magnifying power of about forty diameters, are found to have

their walls in contact, and consequently to be themselves flat. In these flattened cells, forming mere scales of epithelium, the nucleus or central granule is yet very readily discerned.

The etymology of the word epithelium is in itself explanatory (ἐπι, upon, θαλαμος, a bed). Epithelium is in fact the layer or layers of nucleated cells found on the free surface of animal bodies; the form and the arrangement of these cells are found to be very variable, according as we examine the internal mucous membranes of the body, the interior of glands, and so on. If we scrape the tongue with the finger nail, we shall get from the surface epithelial scales entangled in the mucous of the mouth. In like manner the surface of the body is covered with epithelial scales of a flattened form which are collectively termed "the cuticle."

So much then for the form of these particles. At the papillæ we observe their size is less than at the surface. This is explicable by the view that, whereas in the former situation the granules are devoid of cell wall, in the latter they have assimilated cell walls to themselves, from the homogeneous *matrix* in which they are embedded and which binds them together. It remains that

we should add a few words about the colour of these bodies.

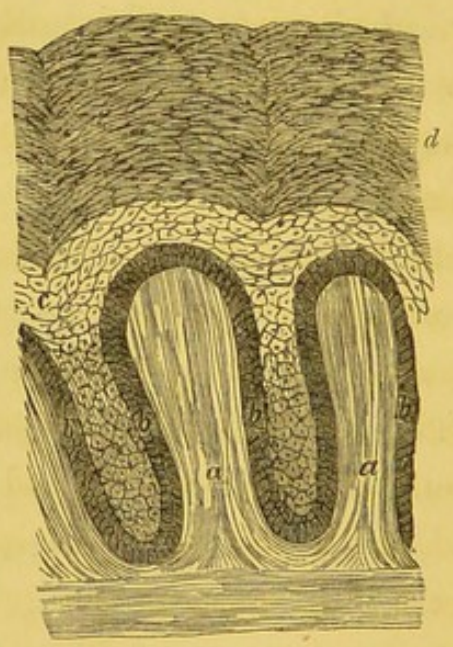
Upon the presence or absence of what is termed the pigment, or colouring matter of these bodies, depends the colour of the skin and the depth of its hue. Strange that such a whim of nature as the bestowal of pigment in certain races should have led to such momentous results, and should at the present day be mainly instigating the contest between North and South America. A more subtle fact than we can here hope to deal with, is the comparatively undeveloped condition of the human mind, wherever the skin abounds in pigment. It is a fact, we fear, altogether beyond dispute, that the dark races are endowed with far less elevated mental attributes than the white-skinned races. That such is so, is with the philanthropist only one, and perhaps the most stringent, of the reasons for shielding his more sombre brother from tyranny and misfortune. To the anatomist, however, the question is of another and more peculiar interest. What is the connection between pigment and intellectual capacity? and whence springs the force that provides for the existence and regeneration of such material? The late Dr. Addison, of Guy's Hospital, made an

important discovery in relation to the generation, under certain conditions of the system, of pigmentary matter, which has since conferred upon him the doubtful honour of linking his name with a disease—the Morbus Addisonii. He found that in certain diseases of an organ situated above the kidney, the skin assumed a peculiar bronzed appearance. How this bronzing—this deposition of pigment in the epithelial cells—can be associated of necessity with disease of those bodies, it would puzzle even the "cold shadow" of Mr. Margrave in the "Strange Story" to explain.

The colouring matter of the skin consists of extremely minute molecules, accumulated often in enormous quantities, composed of an organic material, whose composition has hitherto eluded all analysis. It resides mainly in the cells of the rete malpighii; and, accumulated in largest quantity in the deepest portion of this structure, ceases to be found as the surface is approached. The explanation of this disappearance of colour towards the surface has been attempted roughly on chemical grounds. The more external layers of the cuticle, together with the cells that rest immediately upon the basement membrane, are but little acted upon by weak solution of potash, while the intermediate

cells are readily affected by this fluid. Similar results display themselves under acetic acid. The decrease of colour, therefore, in the superficial laminæ, is upon the chemical view, dependent on modifications in the chemical constitution of the colouring matter, in like manner as the chemical constitution of the cells themselves is equally subject to change.

Upon the presence of colouring matter in the



PERPENDICULAR SECTION OF THE SKIN OF A NEGRO, MAGNIFIED.

a. Papillæ of the true skin.
b. Deeply-coloured cells of the *rete*.
c. Upper portion of the *rete*.
d. Cuticle.

rete malpighii, an attempt has indeed been made to show that this portion of the cuticle is in the

negro a distinct structure, pointing to a specific difference between the negro and white man. But a fatal objection to this argument is to be found in the fact that the deeper layer of the epidermis can be separated by maceration with equal facility in both black and white skins. In the white subject again, it can but at best be said that the rete malpighii is less universally charged with pigment. In the male scrotum, the skin is dark brown from the presence of pigment; and around the nipple in the fairest English woman, there is always to be seen a dark ring clearly charged with the same colouring matter.

The ardent lover, gazing on the fair or olive-tinted skin of his Haidée or his Rebecca, according as his sympathies lead him to cling to the blonde or the brunette, little thinks that his passion would subside into the calmest friendship, and the features of the loved one appear tame and insipid, if in the one case a little pigment were present, or in the other were taken away. We might pursue the subject *à la Balzac*, and deduce a chemical view of the sentiments, and a physical formula for the fondness of the sexes. But, without entrenching on the province of M. Michelet, we will merely notice the fact, that the colour and tints of

complexion reside in the recently formed layer of the epidermis, and that differences in climate and individual peculiarities, wonderfully transmissible from parent to offspring, are the main influences that modify the deposition of colouring matter.

From the above consideration, it is evident that the more we recede from the rete malpighii, the more cut off from the circulating fluids is the epidermis, and consequently the more extra-vital does this structure become. Chemical changes go on at the surface uncontrolled by vital power. The superficial layers of the cuticle are in themselves excretions from the body, so to speak. They are no longer permeated by vessels bearing blood, or by nerves transmitting sensations. It is a matter indeed of daily experience, that the cuticle may be peeled off without the least sensation. A common blister, whether from friction as in rowing, or produced by irritants or heated metals, consists of raised cuticle beneath which the fluid portion of the blood circulating in the vessels has been driven by the stimulus applied; and every one has cut a blister and let out the serum without experiencing any pain. We, in fact, can shed, if not all our skins, a portion of them, without discomfort, and in reality are continually doing so. In recovery from fever

it is not uncommon for the patient to part with sheets of epithelium, and we ourselves have seen complete casts of the hand and foot thrown off during convalescence. After scarlet fever more especially, the cuticle crumbles off in a striking manner, and medical men can, not unfrequently, determine the previous existence of the disease long after its subsidence, by the desquamation that is going on. The epithelial particles at the surface, dried up by evaporation, become scaly and brittle—the shape of them from pressure, we have seen, becomes flat; and eventually either in flat masses or minute scales, the surface of the cuticle is ceaselessly being thrown off.

It is with respect to our own particular subject that these remarks have especial bearing; for taking into account the fact that the "scurf" which so persistently clings to the scalp and hair, is but the dried epithelium of the cuticle, we obtain indications for treatment of this affection, and of others depending like itself on an unnatural accumulation of this extra-vital product.

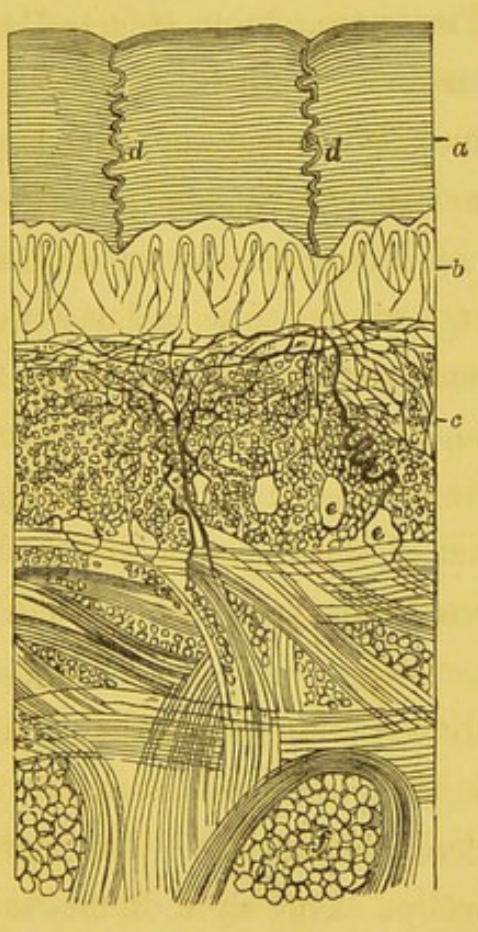
It is in passing, as we now do, to the consideration of the derma or cutis vera, that we find the knowledge we have obtained of the varieties of fibrous tissue valuable. Indeed, it is indispensable,

inasmuch as this layer of the skin is made up of both kinds of this structure—the yellow and the white. The yellow imparts the peculiar elasticity, the white the tenacity, to the structure. The former property enables the skin of the scalp to return to its natural state after being stretched, as indeed it is, by every movement of which it is capable. The swellings from inflammation, the enlargements from morbid growths, obesity, and pregnancy, from effusions, as in erysipelas and in dropsies, both are enabled to occur and to leave but little or no traces behind them owing to this property; while, on the other hand, the tenacity of the structure opposes itself to the protrusion of the contents of cavities, such as that of the abdomen, and to those ruptures which severe muscular exertion would, but for it, of necessity entail.

In addition to these properties of a covering to the entire body, the derma ministers to sensation both general and special. The nerves through which sensation is conveyed from the skin to the brain ramify and terminate in loops mainly in the superficial layer of the derma—the papillary layer of anatomists. The deeper portion of the true skin, called the corium, is mainly subservient to the protection of the delicate tissues beneath, and to the

affording a *nidus* for the lodgment of the sudoriferous and sebaceous glands with which the skin is supplied.

The sweat glands imbedded in the cutis vera vary in size and in the length of their excretory ducts,



SECTION OF THE SKIN OF THE PALM OF THE HAND, MAGNIFIED.

a. Epithelium.
b. Papillary layer.
c. Corium.
d. Ducts of the sweat glands lying at *e*.
f. Cushions of fat.

and it is owing to these, and to the little masses of fat, that the fibrous tissue surrounds, that the skin, at its deeper portion, acquires that areolar or sieve-

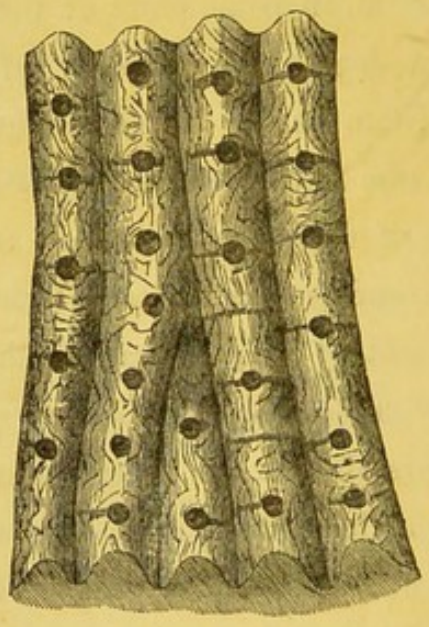
like appearance that characterizes it at this part. The skin is connected with the subjacent structures, as we have already mentioned, in the scalp, by areolar tissue ; and, although the fibres of the fibrous tissue making up the corium, are totally different from this structure, yet it is scarcely possible to define an accurate limit between them. The texture of the corium is closely woven, and although the component elements which compose it differ in quantity according to the office the skin is intended to fulfil, yet, both the white and yellow fibres enter as constituents of the frame-work of this layer. The fibres of the yellow variety of fibrous tissue mostly assume a horizontal course, and are superimposed in successive layers, one above the other, intercommunicating freely above, below, and on every side. These series of bundles of fibres consequently have infinite meshes between them; which though mostly oval, are in the aggregate considerably flattened to harmonize with the general surface. The skin of the scalp is very rich in this yellow fibrous element, and it is so in common with other portions of the skin, where elasticity and extensibility are in requisition. Thus, the skin of the axilla is mainly formed of the yellow element; while, again, the cutis of the sole of the foot and the palm of the hand,

affording, as it does in these localities, great resistance to pressure, is mainly composed of a dense interweaving of the inelastic white fibre.

The corium, therefore, is formed of bundles of interwoven fibres, which, possessing at the same time elasticity and strength, afford protection to the delicate subjacent structures, the extremely sensitive, nervous, and vascular twigs that permeate it, and such ducts from glands as have to pass through to the surface. But the corium, in some parts of the skin, enjoys, to a certain degree, the property of contraction. Such a condition is due to certain quasi-muscular fibres which are found entering as components of the bundles of tissue we have seen to be made up of the white and yellow fibres. It is to this contractile element of the corium that the scalp owes its power of molecular contraction. The coarser movements are due to the larger muscles we have described, but those curious phenomena of motion which, for example, display themselves when the hair becomes erect during fright, originate, and depend upon, this *muscular element of the corium.*

But it is to the papillary layer that the skin of the scalp, as of other portions of the body, is indebted for the susceptibility to tactile impressions, which, in the former region, occasionally attain

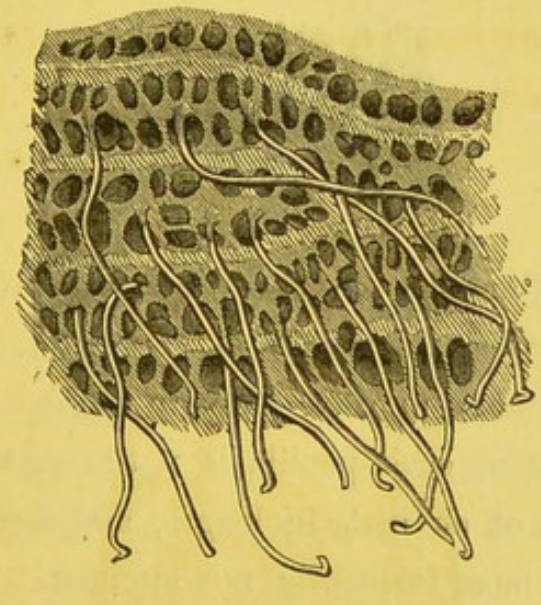
excessive development. Much thinner and more delicate than the corium, the papillary layer is, to a great extent, made up of nerves and vessels which supply both these and the layer itself, and which impart the pinkish hue to the entire structure. The integument itself, when the papillary layer is developed, is furrowed out into more or less finely-marked grooves, separated from one another by corresponding ridges. The direction of these may



Surface of the skin, magnified twenty diameters, showing the ridges and furrows, and the orifices of the ducts from the sweat-glands.

at a glance be seen in the hand, and an inspection of them will afford a more accurate knowledge than the most elaborate description. The grooves may be seen to assume curves and branchings which

indicate the direction taken by the essential organs of touch characterizing the papillary layer, and termed *the papillæ*. The papillæ* are small cones which, being exquisitely sensitive, are, from their form, susceptible of conveying to the mind a greater collective tactile impression than if the surface of



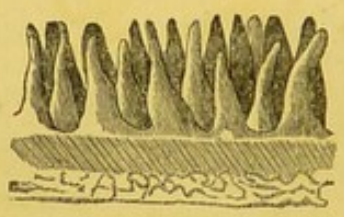
Under-surface of the skin, magnified, showing the depressions in which the papillæ have been lodged.

the layer were perfectly even. The grooves, then, are formed by the sinking in between the papillæ of the epidermis; a condition which, by aid of a lens, can readily be verified.

These little organs are mostly semi-transparent,

* See pages 42, 47, 52.

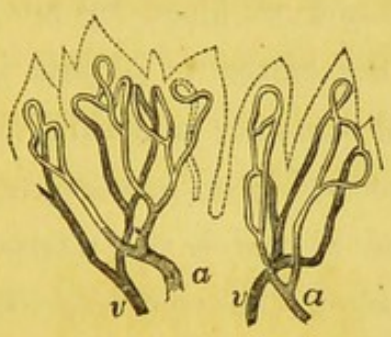
and enjoy a certain amount of flexibility and tenacity, due to the fibrous structure they contain within the very delicate and itself structureless envelope which surrounds them. This fibrous structure has a vertical arrangement, and is not very easy of detection. The papillæ are not of



equal size, and so, consequently, the depressions of the epidermis which sink in between the rows of them are more or less strongly marked. In the skin of man, each papilla is not more than one-hundredth of an inch in length, and these dimensions are most frequently not attained. The base of each papilla does not exceed in diameter the two-hundred-and-fiftieth of an inch.

We now understand by what means the skin is enabled to subserve special function, the scalp to acquire a high degree of sensibility, and that, both in this region and throughout the general surface, the skin is furrowed in the way that is so familiar. But what is within the papillæ ? Some little fibrous element we already have seen ; but, in addition, an

arterial and venous ramification, and the twig of a sensitive nerve.



VESSELS OF PAPILLÆ.

a. Artery. *v*. Vein.

The arterial and venous ramifications are demonstrated by means of minute injections. We have several such specimens, that, unused as we ourselves are to microscopic manipulations, afford good examples of the method of arrangement, and of the plan of circulation in various papillæ. It is at the surface of the body, and in the cutis vera that the alteration in the character, physical appearance, and chemical qualities of the blood are brought about. The contents of the arteries are of a red colour. The blood in the veins is of a much darker hue. In transforming from one to the other the arterial blood passes through a minute system of vessels called capillaries, from *capilla*, a hair, so small for the

most part are they. It is a capillary vessel, then, that each papilla contains. The papilla is supplied with nutritious and red blood by an arterial capillary. When the extremity of this is reached, the blood forthwith assumes a darkish hue, which is the stronger marked as it passes through the venous capillary vessel in which the arterial branch terminates. Between the completely-formed venous twig and the original arterial twig are small loops, which together unite at the base of the papilla.

The vascularity, therefore, of each papilla depends on the calibre of the arterial and venous twig respectively. In certain inflammations of the scalp, stagnation of blood may very readily be noted by the alteration in colour, brought about by an enlargement of the tributary branches of the cutis. And, indeed, it requires but a moment's reflection to understand that increased diameter of the arterial branch will heighten the colour of the part supplied, while dilatation of the venous vessel will, in like manner, deaden its hue.

But, as we shall see, the amount of vascularity of a part—such as the skin—depends, not only on the original calibre of the vessels, but upon the influence exerted upon the blood supply, by the nerves which surround the vessels. There is an intimate con-

nection, consequently, between the nervous and vascular supplies ; and, as a general rule, it may be stated that the vascularity of the cutis of the scalp will depend in all cases upon the perfection it enjoys of appreciating tactile impressions, which are themselves dependent upon the distribution of the nerves.

So intimate is the connection of papillary function with nerve distribution, that papillæ have indeed been held to be merely expansions of the nerves themselves. This we have seen to be inaccurate, inasmuch as the papilla contains fibres and vessels. But the nerve that enters the papilla plays a most important part in its structure and function, and so important is it, with respect to the skin of the scalp, that the anatomy of nerve distribution should be familiar, that we shall make some few special remarks upon its intimate characters in a separate chapter.

CHAPTER V.

THE CHEMICAL HISTORY AND FUNCTIONS OF THE SKIN.

From what has preceded on the subject of the chemistry and functions of the component tissues of the skin, the reader will not be unprepared to enter upon a consideration of the skin as a chemical and vital structure. That so complex an organ, comprising so many different structures, should present to analysis a series of complex organic principles, need not excite surprise; nor, seeing the enormous surface over which blood is extensively circulated, the secretions that constantly pour from every part of it, the multifarious sensations it is the ever-watchful means of imparting to consciousness, can the thoughtful fail to be impressed with admiration, not only with the physiological attributes of the structure, but with the wondrous harmony with which the several functions are performed.

In certain museums there may be found, by the curious in such matters, specimens of very good leather obtained from the skin of certain notorious

malefactors; and leather may be made from the skin of very good people, as well as from that of a Rush or of an Orsini. The essential requisite in the tanning process, from the consideration of which we obtain the most valuable hints in the use of certain applications to the scalp, is that *the gelatine* of the white fibrous element of the skin should enter into combination with a vegetable astringent.

Though not very prone to decomposition in their isolated state, the several components of the skin readily take on putrefaction when co-existing in the texture. The hides of animals, like their soft parts, readily yield to the play of those chemical forces of which decomposition is the exponent. The decay is due, in most part, to the constituent water, and when the skin or the hide loses this water, it becomes brittle and rigid, and unfit for the purposes to which leather is well adapted. The dried scalps, worn by the Indians, rattle together almost as noisily as would the bones themselves of those on whom they have practised the amenities of war.

The principles which guide the manufacturer in converting skin into the article so much in request as leather, and the nature of the chemical basis which, under the name of gelatine, characterizes the

skin not only of the scalp, but of the whole body, need not be dwelt upon. The peculiar property possessed by gelatine of uniting with tannin should, however, be borne in mind. We proceed to consider the ultimate composition of this important principle, and avail ourselves of the opportunity to dwell upon and finally dismiss the chemical composition of the muscular and remaining tissues of the scalp.

All vital substances are composed of both a solid and a fluid constituent. The fluid is water, which makes up at least three-fourths of the weight of an organized body. A mummy, for example, weighs but very little in comparison with the body it was. Blumenbach had in his possession a perfectly-dried mummy, the votive offering of the friendship of Sir Joseph Banks; and this mummy, with all its muscles and viscera, weighed no more than seven pounds and a half. The water abstracted, what then are the tissues made of? Ultimately, they are built up by the so-called elements —carbon, hydrogen, oxygen, nitrogen. But a tissue can, before it is sifted into these ultimate substances, be made to furnish certain *proximate* principles, compounded of these elements. Take,

for example, an egg. The shell is not organic: it is of mineral constitution, made up principally of salts of lime. But the contents of the egg-shell are organic, and consist mainly of a substance or proximate principle, which, as the white of egg, can be readily got by boiling, and which, so obtained, is called albumen.

Albumen is *one* proximate principle; gelatine is another proximate principle, and the curd of milk furnishes caseine, for example, a third proximate principle. These proximate principles are, some of them, in solution in the body. Albumen is in solution in the blood. Others are in the solid form. Thus, the proximate principle, fibrine, is found solid in the muscles. And, solid or fluid, the several proximate principles form the material from which the organized tissues are built up, sometimes by these alone, and, at others, by these in combination with such elementary substances as phosphorus, sulphur, and so on.

The proximate principles of fat are the physiological compounds elaine, margarine, and stearine, we have described. The proximate principle of the nerves is albumen; and, as we have said, the skin is mainly built up, from a chemical point of view, of the proximate principle gelatine.

Elaine, and its associates in fat, we know contain but three elements in their composition, carbon, hydrogen, and oxygen. But albumen, fibrine, and gelatine, the three principles with which we are now concerned, all contain a fourth element, called nitrogen, whose presence seems essential to the existence of a truly-organized vital structure.

Albumen and fibrine, moreover, contain phosphorus and sulphur. Gelatine contains the four elements solely.

Now, it is remarkable that all these proximate principles are taken into the body in the food. They are constantly undergoing decomposition in the cycle of existence, and in the wear and tear of the tissues, which, to a certain extent, is inseparable from health. To replace them—decomposed, effete, and removed—they must be constantly furnished to the blood in a fluid form. It is necessary, therefore, both that the food should contain the principles and be susceptible of solution in the stomach. The process of nutrition essentially consists in the selection of these proximate principles from the blood, and in the appropriation of them into themselves by the several textures. And it has been experimentally shown, by more than one enthusiastic and self-sacrificing physiologist, that life,

not to say health, cannot be sustained by any one of these principles solely. All attempts to live upon any one of the proximate principles, whether albumen, fibrine, gelatine, or any other, have resulted simply in starvation.

The ultimate composition of the three principles with which we are concerned can be seen in the table :—

	Albumen.	Fibrine.	Gelatine.
Carbon	54·84	54·56	50·048
Hydrogen . . .	7·09	6·90	6·477
Nitrogen . . .	15·83	15·72	18·350
Oxygen	21·23	22·13	25·125
Sulphur	·68	·36	...
Phosphorous . .	·33	·33	...
	100·	100·	100·

Isolated from the extraneous arterial, muscular, nervous, and other tissues, which are so intimately intermingled with the skin fibres, we arrive, then, at the proximate *gelatinous nature* of the skin. A few words will not be out of place on the chemical nature of the muscular tissue.

Muscular tissue consists mainly of coagulated fibrine, but, being pre-eminently a vascular structure, and containing nearly three-fourths of its own weight of water, it is permeated by a fluid made up, in great part, of blood, and partly of secretions

from the blood. There are, consequently, soluble and insoluble constituents. The chief insoluble constituent is the fibrine. The soluble constituents may be obtained by digesting muscle, such as for example, some lean beef, in water. Analysis of the solution then shows that albumen and blood-salts are present in abundance, and two curious animal principles, *kreatine* and *inosite*—this latter being a species of sugar,—together with phosphoric acid and two organic acids, the lactic and the butyric.

Nervous matter is stated by Vauquelin, a French chemist, to be chemically an emulsion of water to the amount of seven-eighths of its weight, fatty matter, and albumen. A large proportion of the albumen is present in the coagulated form; but the peculiar properties of nerve tissue seem to be due to a solid fatty acid, the *cerebric acid*, and to an oily acid termed the *oleophosphoric acid*. The former is present, partly uncombined, and partly united with soda. It is obtained by the chemist in the form of white crystalline grains, which in water swell up like starch. It is very rich in carbon, contains nitrogen as well as hydrogen and oxygen, and half a grain of phosphorus in a hundred grains. Oleophosphoric acid, like the cerebric acid, is pre-

sent, partly uncombined, and partly united with soda as a soapy compound. Gobley has found it in the yolk of the egg. On boiling it with water, it becomes converted into the proximate principle olein, and into phosphoric acid.

The most notable substance in the nervous tissue is the phosphorus, either as phosphorus or combined with oxygen to form phosphoric acid. Considering the intimate dependence of nutrition upon the integrity of the nerve force, it is at once evident that phosphorus plays a most important part in bringing about the due peformance of the functions of any portion of the skin; and no vain inquiry would it be to ascertain the extent of the dependency of the hair upon the supply of this essential element throughout the nervous sheet with which the scalp is furnished. Nor is this straining physiological induction beyond its justest limits; for if one function, intelligence, is found to be perfect or impaired in a direct relationship to the amount of phosphorus in nerve tissue, it is not unreasonable to surmise that a faulty condition of the hair, intimately associated, as this structure is, with secretion, should in like manner stand in similar relationship to a constituent of that nervous tissue on which the function secretion itself inalienably depends.

Now, L'Heritié found, as the result of a large number of analyses of brain substance, that the amount of phosphorus present in the brains of idiots, infants, and old men, fell considerably short of the amount present in the brains of youths and adults. From 100 grains, he procured from the infant and idiot only four-fifths of a grain of phosphorus; while from the brain of youths and adults he obtained with similar quantities, one grain and four-fifths.

The chemical facts at which we have so far arrived, serve us to this extent: that they supply us with data on which to proceed in bringing about a healthy nutrition of the scalp, of assisting, by local and constitutional treatment, through the agency of aliments, medicines, and applications, to promote the growth of the hair, since the skin of the body, and of the scalp more particularly, have complicated functions to perform, independent altogether of contributing to their own nourishment; functions which can scarcely be impaired without such general systemic derangement as results from the accumulation in the circulation of materials destined for excretion.

CHAPTER VI.

ON THE FUNCTION OF PERSPIRATION.

THE main purposes to which the skin is subservient, are the processes perspiration and absorption. Of these, the former is physiologically the most important—the latter of considerable therapeutic importance. If a magnifying glass be applied to the healthy skin of the forehead and the glass be subsequently looked through, a drop of moisture will at once be seen; and this even when the skin is to the touch apparently free from moisture. And on a sultry day, or after severe exercise, all of us are familiar with the phenomenon of perspiration. Occurring from the mouths of the innumerable pores upon which the sudoriferous glands open, the amount of perspiration given off in the course of the 24 hours amounts to a quantity which at once shows that the perspiratory function is one of the most active, and, by inference, one of the most important functions carried on in the living organism. With a view of estimating the amount of work done by the perspi-

ratory system, Erasmus Wilson was at the trouble to count the perspiratory pores on the palm of the hand. In a single square inch he counted 3528. Each of these openings is the termination of a tube, about a quarter of an inch long; and, consequently, in a square inch of skin in this region the length of tube exceeds 73 feet. The number of apertures in similar areas of other parts is not, of course, precisely the same; but that author considers, from his own observations, that an assumption may fairly be made that the average number of pores in the square inch of surface is 2800. Calculating for the whole area of surface in a man of ordinary height, he assumes the number of pores to be 7,000,000: the number of inches of perspiratory tube 1,750,000, that is, nearly 28 miles.

Now, although we cannot allow, with this author, that a drainage of fluid occurs at every part of the tubes, inasmuch as the perspiration itself comes from the gland at the bottom of the tubes, still, the quantity of water secreted by this system is something almost beyond belief. A similarly curious calculation with the above informs us that upwards of 4 lbs. of water are thrown out of the body in 24 hours. A larger portion of this makes its way to the surface in the form of insensible perspiration;

but this condition readily becomes modified under a great variety of circumstances, until it attains its acme in that active state wherein the perspiration is popularly said actually to stream away.

Nothing more tends to impress upon the reflective mind the wondrous attributes of the nervous system than the sudden abundance of certain secretions under its unwonted action. The saliva flows into the mouth of a hungry man at the sight of palateable food; the tear springs unbidden to the eye at the call of pity, sympathy, or regret, the gastric juice is poured into the stomach when required for digestive purposes, even though the mind be unconscious of the act; and similarly the perspiration bursts from every pore alike when the criminal is convicted of his guilt, as when the sufferer is racked by the anguish of disease.

It may be questioned whether the sudden flux of perspiration be not itself subservient to the elimination of some poisonous material, soluble in water, which is freely formed under certain mental and physical conditions, and which could scarcely find so ready an outlet as that which it obtains through the perspiratory system. The phenomena of rheumatic fever, and of certain other febrile diseases, seem at once to confirm this view, and to point to the most

important purpose discharged by the perspiratory function. In the former disease, physicians are accustomed to observe profuse acid sweatings, which cease with the decline of the fever; and the acid found in the perspiration is known to be the lactic acid. Again, the critical days of certain continued fevers are favourably noted by the attendant perspirations, the means adopted by nature for getting rid of the poison with which the blood is most certainly charged. It is no objection to this view that perspirations do undoubtedly occur in certain debilitated conditions of the system, independent, it should seem, of actual disease; for it may fairly be surmised that when the system labours under prostration, from whatever cause, those forces which result in the decay of the tissues cease to be subject to the controlling power which in health restrains them within their just limits. And, granting such decay, it follows that the retention of the products of it would of necessity be injurious. Nor is there any weight in the objection that excessive, or even the natural healthy, exercise, is followed by perspiration. For exercise is always attended by decomposition of the muscular and nervous tissues, giving rise to products which are undoubtedly poisonous, which call for immediate excretion, and

which do but require to be formed in excess and retained, to constitute those very diseases we have just alluded to.

The collection of sweat for chemical examination is one of considerable difficulty, and, consequently, comparatively imperfect analyses only have been made of this important secretion. The solid constituents are principally salts, among which the chloride of sodium or common salt is the most abundant. There is a small quantity of phosphate of lime present, and salts of soda and ammonia, compounds of these alkalies, with lactic, butyric, and acetic acids. The sulphates are present only in small quantity. The perspiration contains a peculiar organic compound rich in nitrogen, readily undergoing decomposition; and, further, an odorous principle.

The throwing then out of the system these several solid constituents, especially the characteristic nitrogenized product, is, doubtless, the principal purpose of the perspiratory process; but we are led to a still higher view of its real nature by the observation that by means of the perspiration processes occur upon the surface of the body which resemble those taking place in the kidneys and lungs. It is found that, like the kidneys, the skin

excretes nitrogen, and, like the lungs, gives off carbonic acid. There can, then, be no doubt that the function of the skin is, in fact, *vicarious* of the function of those organs; a fact of which we obtain, we are informed, ample confirmation under several pathological conditions. It is, for example, well known, that bronchitis and febrile catarrh are very frequently followers upon a sudden chill, and that a prolonged wetting will often bring on an attack of inflammation of the kidneys. That suppression of a secretion, poured out from so extended a surface as the skin presents, should be prejudicial to the system, is scarcely a matter of surprise. The wonder is that nature should afford so admirable a system of compensation as is established by means of the organs we have mentioned, and provide the system with a safety valve, to obviate the evil results due to the filthy and apathetic habits of that very large family of the human race who go by the name of the Great Unwashed.

So nicely balanced is this compensating function, that the skin, in certain severe forms of kidney disease, actually secretes the urine of the sufferer. The skin takes on an urinous smell, remarkably characteristic of the conditions which induce it;

and certain *secondary organic compounds* are thrown out by the sudoriferous glands, which usually pass away in the renal secretion. Secondary organic compounds, we would observe, are certain substances formed in the system which are in themselves injurious to it if retained. One of these, for example, is urea; and another is uric acid. These substances are both rich in nitrogen, and are, in every sense of the word, poisons. They are bodies of complex chemical composition, whose formation appears essential to the well-being of the economy, as though some force were evolved in the process of their manufacture which exercised some important and possibly essential office in establishing and perpetuating during life the processes of nutrition. The urea compounds are thrown out by the kidneys, the lungs, the skin. Sometimes they are not entirely removed, and uric acid deposits itself consequently in the joints, in combination with soda, giving rise to the peculiar so-called chalk stones, with which gouty people are often altogether crippled. The skin endeavours to discharge the function of a failing organ. It partly succeeds, but the attempt is not entirely successful, and the imperfection of the process displays itself in the deposited materials it is unable

to remove. In Bright's disease of the kidneys, the structure of these organs is so much damaged that the urea which should be thrown out by them accumulates in the blood. Forthwith the whole of the circulating fluid becomes poisoned. The nervous system suffers especially. The patient loses his memory and his powers. By degrees he becomes semi-comatose, and, unless medical relief is afforded, he dies asphyxiated or epileptic.

Urea has, somewhat recently, been ascertained to be present in the healthy perspiration of the inhabitants of warm climates, and such a fact would seem to show that the secretion is of still greater importance under elevated temperatures than in temperate climates, even were we ignorant of the important share taken by the perspiration in regulating the heat of the body. Urea is very soluble in warm water, and a part of the secretion may be thrown out through the influence of the determination of the urea to the surface; but, apart from chemical considerations, alterations in temperature and hygroscopic conditions of the surrounding atmosphere are of themselves amply sufficient to modify the amount of the secretion. The quantity of fluid thrown out by the skin is, we know, far greater when the atmosphere is hot than when it is

cold; and the profuse perspiration induced by the Turkish bath sufficiently shows the influence of extreme degrees of heat in bringing the secretion to a maximum. But sweating is controlled, not only by the heat of the air, but by the amount of moisture present in it; in like manner as the amount of evaporation which accumulates in the form of dew is subject to the same conditions. The object of this variation is evident enough; for, by means of the perspiration, the temperature of the body is regulated.

The vapour of water is simply water which has absorbed a certain amount more of heat than it required as water. If a little water be placed in an evaporating dish and gently heated, it will soon disappear in the form of vapour. The heat has transformed the water into a gas, which has a greater capacity for heat than the fluid from which it springs. Heat becomes, in fact, latent, when consumed for the purpose of changing the physical condition of bodies. In the case of the perspiration, the vapourized water takes its heat from the body. The greater, therefore, the perspiration, the greater is the loss of heat; for the water disappears as a vapour, and, in the act of transformation, takes heat away to make it such.

The entire loss by exhalation is supposed to amount to 2 lbs. in the 24 hours from the lungs and skin. In a dry, warm air this amount has been found to attain to 5 lbs., and in a cold atmosphere, already charged with moisture, it has been found not to exceed $1\frac{2}{3}$ lb. The amount furnished by the skin is at least two-thirds of this quantity.

The purpose of the *sebaceous* secretion is evidently to lubricate the skin, and in the scalp, more especially, we find the sebaceous follicles extremely plentiful, and performing the evident office of greasing the hairs, and so preventing them from cracking and breaking, as they would readily do if unnaturally dry. The effect of the sun is obviously favourable to the drying of the hair; accordingly we find that in the scalp of the inhabitants of hot countries the sebaceous glands are much more numerous, and, compared with those of the inhabitants of colder regions, more highly developed,—another remarkable instance, if one were needed, of the adaptive power of Nature to modify her plans according to the circumstances.

Many persons, in their natural state, and still many more when indisposed, or subject to disease, are troubled with the unpleasant emanations that are thrown off under such conditions by the skin

and the lungs. The body and breath emit a peculiar and oftentimes a disgusting odour, resulting from unhealthy secretions. The matter that imparts the odour is doubtless formed in the blood, and is, in fact, so much evidence of its impure condition. The breath is tainted by the morbid products which are formed either in the stomach, or at some other point in the system. With respect to the odour emanating from the skin, it is difficult sometimes to decide whether the sudoriferous or sebaceous glands are the more engaged in the elimination of the material possessing it. Many animals, as is well known, have scents peculiar to themselves, which may, indeed, be set free from the blood of the species by the addition of sulphuric acid; and such blood, whether normal or whether tainted, supplies equally the oil and the sweat glands. The sickening odour some unfortunate people give out, emanates, if general rather than special knowledge can be accepted on such a subject, mostly from the feet; and we would point out, in elucidation of this circumstance, the chemical fact that though the perspiration is generally acid at other parts of the body, it is mostly alkaline in the feet and hands. This may be readily ascertained by observations upon the reaction of the skin mois-

ture at these parts upon litmus and turmeric papers.

Medical men are not unfrequently in the habit of applying medicines to the surface of the body by what is termed the Endermic method. Most of us have had a blister on the chest, and have, when the whitened scarf-skin has been removed, observed the pink and vascular sensitive skin. If now, certain substances be applied to this sensitive skin, either in solution or as an ointment, they will forthwith get into the current of the circulation by the process of absorption.

This property of the skin to absorb when the epithelium is removed, it retains to a certain extent when the cutis is left undisturbed. When the scarf-skin is dry, absorption occurs only to a very limited amount; but when by the use of re-agents and warm moisture the epithelium becomes saturated, the process occurs to a far greater extent. A patient has indeed been fed before now by immersion in a milk-bath, and it is the recognition of this absorptive function of the skin which enables us to act so successfully upon the hair follicles and hair roots; and, by our moist method of treatment, to remedy those numerous conditions of the hair which depend on deficient nutrition.

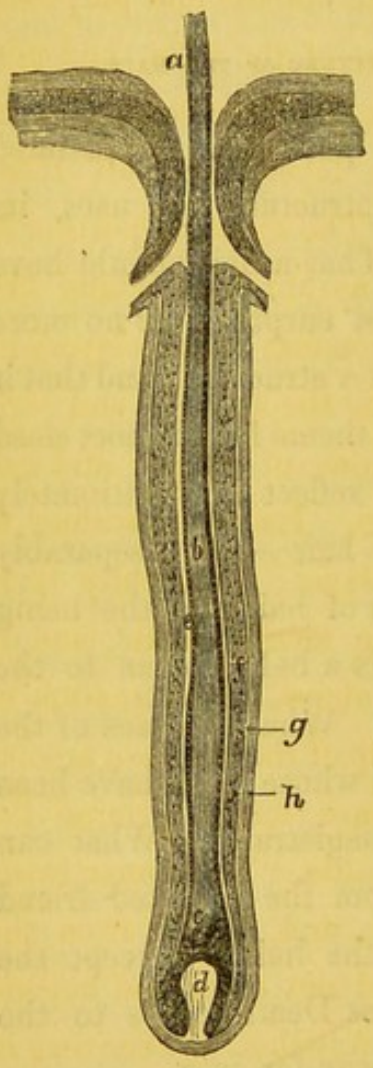
CHAPTER VII.

NATURAL HISTORY AND STRUCTURE OF THE HAIR.

Both the anatomist and poet have expatiated upon the hair; upon its structure, its uses, its beauties, and its varieties. That a hair should have attractions for the anatomist surprises us no more when we discover that it has a structure; and that it should so often have been a theme for the poet need not be wondered at if we reflect how intimately associated are beauty and the hair—how inseparably linked together are thoughts of hair and the being who once owned it. What is a bald woman to the most enthusiastic Lovelace? What becomes of the self-respect of an individual whose locks have been curtailed by order of the magistrate? What can respectful memory claim from the departed friend or relative but a little of the hair?—except the skeleton, all that remorseless Death leaves to the living, of the victims torn away for ever.

A hair from the human head presents by no means the simple structure that at first might be, and possibly is, generally supposed; even under the microscope its real character is apt, with a low power,

to be readily misapprehended. When the magnifying power of the object glass is not great, it appears black at the sides and light in the centre, and conveys the notion that it is a tube; an erroneous view, which nevertheless was entertained for a very considerable time.



A HAIR IN ITS HAIR FOLLICLE.

a. Shaft. *b*. Root.
c. Hair-bulb. *d*. The Papilla.
e. The Follicle. *f*, *g*, *h*. The three layers of the hair follicle.

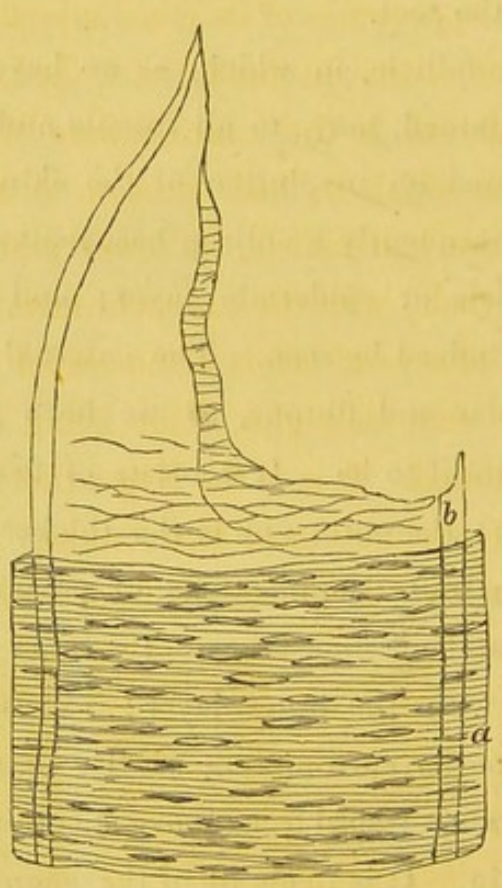
Taking a hair of moderate size we find it implanted in an involution of the basement membrane, termed the hair follicle, which usually passes through the cutis into the subcutaneous areolar tissue. The hair is fixed to the bottom of this follicle by a dilatation termed the hair bulb, which encloses a conical or rounded body that springs from the bottom of the follicle, and which is termed the papilla or pulp. The fully formed portion of the hair which projects beyond the free surface is the scape or shaft of the hair.

The third portion, which is included between the bulb and the scape, but is contained within the follicle, is the root.

The hair follicle, in which, as we have said, the hair is contained, may, to all intents and purposes, be considered an involution of the skin, and presenting consequently a cutis, a basement membrane, and a cuticle or epidermic layer; and all these parts may indeed be seen. The external portion is very vascular and fibrous, as we have found the cutis vera itself to be. It consists of two layers or membranes; the outer one is the thicker, and contains the minute ramifications of vessels and extremely small nervous twigs. Its inner surface is connected with the inner layer; externally it is attached to the surrounding areolar tissue, and is evidently, when traced from above, a continuation of the true skin. It is made up of the common areolar tissue, whose strands we have found forming the connective element in the cutis. The inner layer is of more delicate structure, and, traced from the base of the follicle, is found not to extend beyond the orifice of the sebaceous follicles. It consists of a single layer of transverse fibres.

So much for the two external layers of the hair-follicle proper. The third layer is the basement membrane, which, like the basement membrane of

other tissues, presents no structure. It does not cover the papilla but extends from the base of the



INNER LAYER OF THE HAIR FOLLICLE, MORE HIGHLY MAGNIFIED, SHOWING ALSO THE BASEMENT MEMBRANE.

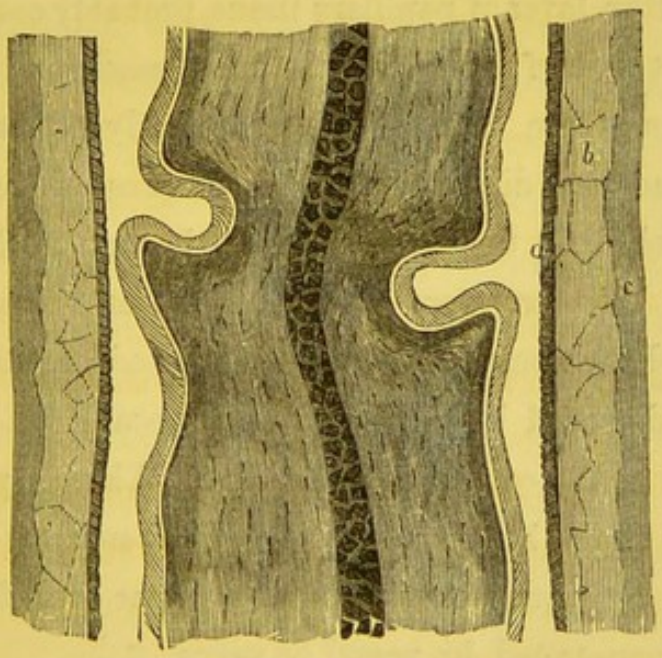
a. Inner layer with transverse fibres. *b*. Basement membrane.

hair-follicle as far as the innermost root-sheath, as we shall presently describe. Its appearance is more or less fibrous, but nothing very definite can be said of this simple texture.

The third part of the follicle is constituted by the oot-sheaths. These are the cuticular lining con-

tinuous with the epidermis, and resembling it very narrowly in the rounded form of its deeper cells, and in the scaly appearance of its more superficial ones, which are, of course, in contact with the hair. The outer root-sheath is the continuation of the rete malpighii, on which we had occasion to dwell. It lines the entire hair-follicle, its lower part being in contact externally with the basement membrane. It is made up of several layers of nucleated cells like those of the rete malpighii, some being elongated and others round. It is in the Negro that this layer of the follicle assumes most distinctness.

The inner root-sheath extends from near the base



HAIR AND ITS ROOT-SHEATHS.

a. Outer cuticular layer of the hair.
b. Inner layer of root-sheath.
c. Outer layer of root-sheath.

of the follicle to the mouths of the sebaceous follicles, where it abruptly ceases. It is firm and elastic, and of a yellowish colour. No interval exists between it and the hair itself. At first sight its structure appears homogeneous, that is, without definite plan and alike in all its parts, but a close examination shows its cellular nature. It consists of two or three layers of polygonal cells. The outermost layer consists of long flattened cells, containing nuclei. The innermost, or Huxley's, layer is formed of shorter and broader cells, which present nuclei, but only in the lower part.

A thin layer of papillary tissue probably coats the lowest part of the follicle in most cases, and where the hairs are larger, and particularly where they assume the dignity of tactile organs, there may possibly be a true papilla at the bottom of the follicle. If there were no such sentient organ, furnished with vessels and nerves, it would be difficult to understand how the porcupine could feel by its quills or the cat by its whiskers. Where a papilla exists in the human hair follicle the basement membrane continues over it, and the true hair is not itself penetrated by vessel or nerve.

The hair is not, of course, the hair follicle in

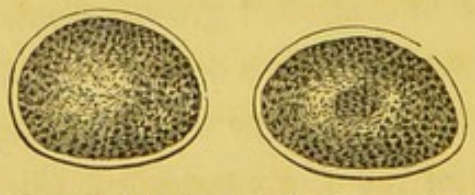
which the hair is contained. Let us pass on to the structure of the hair itself.

We may distinguish three kinds of hairs in the human body. The long soft hairs of the scalp; the short, rigid, and thick hair, as of the eyelids; and the downy or woolly hairs of the back and face. Except the palms of the hands and the soles of the feet, all parts of the general surface are supplied with the hair follicles. Hairs may come, or they may fail in development, but there is, except in these two localities, *provision* for the growth of the hair; and just as we observe, with regard to the growth and thickness of the hair in the several localities where it is usually found, that a hidden law of nature regulates this growth and thickness, so, where the conditions of nutrition are perverted and the system escapes from the control of this law—do we get those extraordinary developments of hair which, every now and then, excite the public surprise. Sometimes the exuberance of the uncontrolled growth displays itself in localities where deformity does not result, and then we witness a length of hair which is really wonderful, as in that of the Burgomeister Hans Steiningen, whose beard was so long, that one day, having forgotten to tuck it up, he trod upon it, and thereby falling down, incontinently killed himself.

But let us defer such topics to a further page, and master a few more dry details relative to the hair proper.

The structure of the hair is so peculiar that its recognition has enabled the microscopist to determine the existence of skin in some fragments of an unknown material nailed to an old church door. The Archæological Society transmitted to Mr. Quekett, of the College of Surgeons, one or two pieces found on the door of Worcester Cathedral, and another from a church at Hadstock, in Essex. On both specimens he was enabled to recognize the remains of human hairs. It is not, therefore, at all improbable but that these portions of skin did in reality once belong to certain unfortunate people whom the tender mercies of the Church, for some infringement of its privileges, had caused to be flayed—possibly alive—to "improve the occasion."

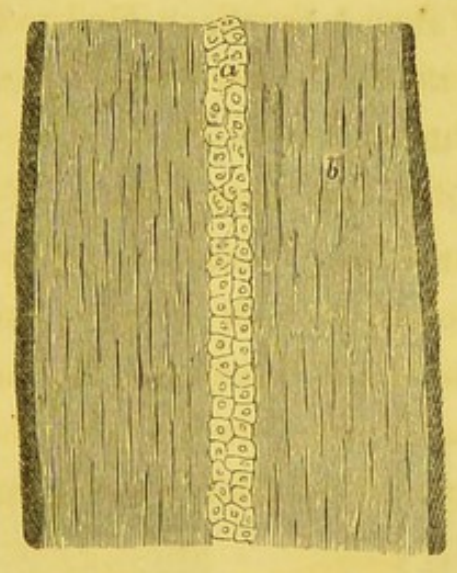
If we examine the shaft of a hair from the scalp,



Transverse section of a hair from the head, magnified 150 diameters, showing the exterior bark or cortex, the fibrous tissue, and the marked central portion.

by light transmitted through the field of the microscope, we find two distinct structures readily to be

recognized. The one is the medullary portion, or the pith; the other is the fibrous portion, or bark. The pith of the shaft is, in the centre of it, more or less black in appearance, irregularly granular and linear. It consists of a number of cells, and is best observed in a hair that has been treated by potash. The cells are then seen to be arranged in two or three vertical rows, closely aggregated together. Each cell has a more or less rounded form, and displays a nucleus, if the alkaline solution has not

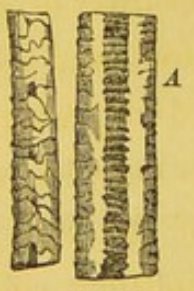


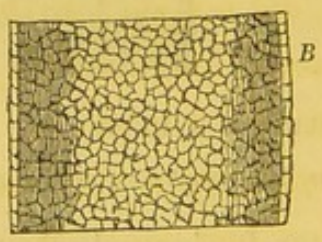
PORTION OF A WHITE HAIR, AFTER TREATMENT BY ALKALI.

a. Nucleated cells of the pith. *b*. Cortical structure.

been too freely used. By transmitted light, a darkish appearance, almost simulating a staining with black fluid, is most commonly seen, and such appearance originated, until very recently, the impression that

the medulla contained pigmentary matter. The appearance is in reality due to globules of air which may be driven from the pith by macerating the hair in oil of turpentine or Canada balsam. The same conclusion is readily arrived at on viewing the hair by reflected light, under which the medullary portions become white, which would not be the case if the darkness owed its origin to pigment. The woodcut shows the appearance presented under the microscope by a white hair which has been partly treated by the balsam. The pith cells of the lower part have been acted upon, while those of the upper part of the medulla still contain the air globules. In the hair of the Indian monkey (*A*) we have found these air cells of the pith very large and distinct; and these cells not unfrequently in some animals,





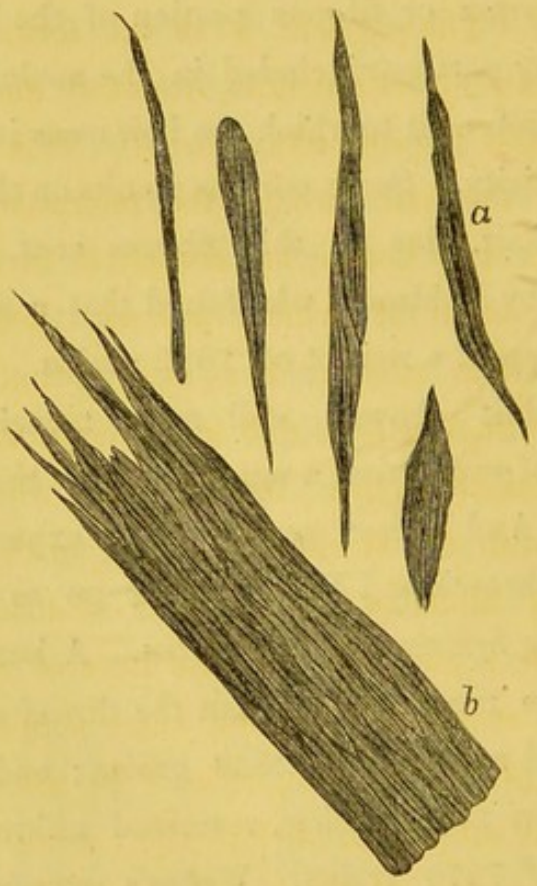
especially among the Ruminants, such as the cow and the sheep, give to the medullary structure the appearance of vegetable cellular tissue. In the

hair, for example, of the moose-deer (*B*), the pith entrenches very considerably on the outer portions of the shaft, so much so indeed, as in some specimens to reduce the coverings of the hair to a mere, though somewhat substantial, film.

The cortex or fibrous portion of the hair is the remaining part not included in the medulla, and is that portion of it to which the hair owes its firmness and elasticity. Some curious results on the tenacity of the hair, due to this fibrous coat, were instituted by Robinson, who found that a single hair could support a weight of 7812 grains. The hair of an adult showed still more tenacity, being capable of supporting a weight of more than 22,000 grains. And Wilson quotes some experiments of Muschenbroeck and Weber, which go to show the surprising firmness of the cortex. A human hair, fifty-seven times thicker than the thread of a silk-worm, did not yield to 2069 grains; and a horse-hair, seven times thicker, remained unbroken by a weight of 7970 grains. Weber's experiments are conclusive upon the elasticity of the hair. He found a hair ten inches long stretch to thirteen inches; and a hair stretched one-fifth returned to within one-seventeenth of its original length.

The cortical portion, p. 86, exhibits numerous

longitudinal dark lines, freely marked with dots, and the constituent fibres may be separately obtained by the action of strong sulphuric acid, at a gentle heat. These fibres are themselves made up of cells, which



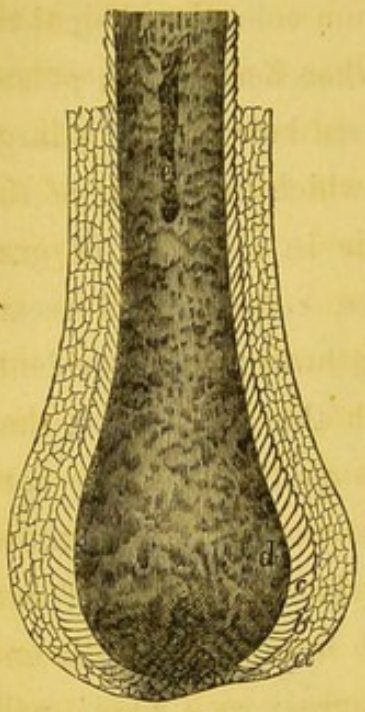
CELLS OF THE CORTEX OF A HAIR AFTER TREATMENT BY ACID.
a. Distinct. *b*. United.

may, in like manner, be isolated by the prolonged action of the chemical. These cells are mostly flattened and angular, and contain lengthy nuclei,

which go to produce, in a great measure, the dotted appearance of the shaft. In a colourless hair these nuclei are readily detected when heated with potash or soda. The cells in coloured hair contain a large quantity of the pigment to which the colour of the hair is due. The pigment is in the form of granules of extreme minuteness, rounded and seemingly arranged in groups lengthways. It is evident, on viewing the hair through the microscope, that these pigmentary bodies are contained in the cortical cells, some of which possess them more abundantly than others. It is evident that if one series of cortical cells is rich in pigment, while another possesses but little, the hair, as a whole, will be tinted with the shade resulting from the alternation. A blending of black and colourless cells will produce a grey hair, and the hues of red and brown are susceptible of the same explanation. The object of the trichologist is, if he knows anything of his subject, to obviate the absence of the pigment in certain of these cells when the hair is becoming white; and it is self-evident that the interior of these fibrous cells can acquire pigment but through these general nutritional channels, whose failure has caused the cessation of the deposit.

At the bottom of the hair follicle we have found

an abundance of cuticular cells; and it is by a peculiar development of these that the fibrous portion of the hair is produced. The hair is, in fact, the modified cuticle of the bottom of the follicle, and is specially remarkable, from an anatomical point of view, in that the epidermic cells assume peculiar types and arrangement. As we get towards the hair itself, the cells, in apposition with the basement membrane of the follicle, assume an imbricated arrangement. The cells of the deepest stratum at the bottom of the follicle resemble very closely those of other parts, which become transformed into the common scales we are already familiar with in the cuticle. The soft, bulbous portion of the hair



BULB OF A BLACK HAIR, SEEN IN SECTION.—FROM TODD AND BOWMAN.

a. Basement membrane of the follicle. *b*. Layer of epidermic cells resting upon it and becoming more and more scaly as they approach *c*, a layer of imbricated cells forming the outer lamina or cortex of the hair. These imbricated cells are seen more flattened and compressed the higher they are traced on the bulb. Within the cortex is the proper substance of the hair, consisting, at the base, where it rests on the basement membrane, of small angular cells scarcely larger than their nuclei; at *d*, the cells are more bulky, and the bulb consequently thicker; there is also pigment in many of them. Above *d* they assume a decidedly fibrous character and become condensed. *e*. A mass of cells loaded with pigment.

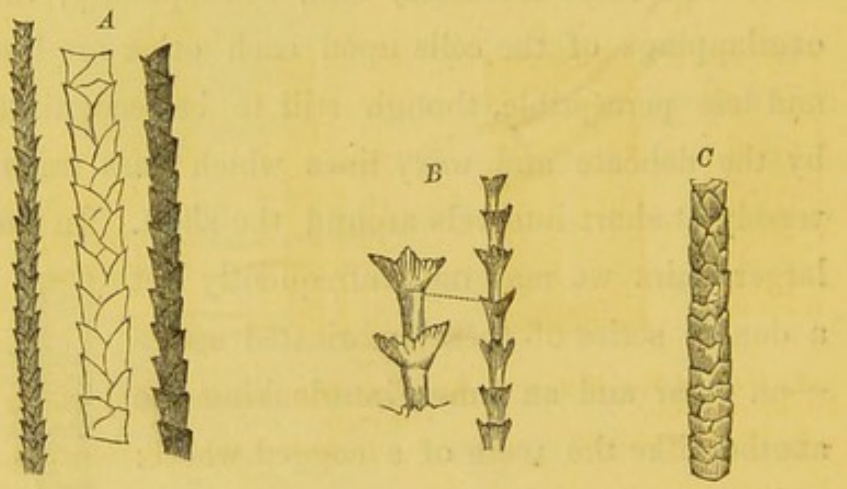
is due to an enlargement of these cells at that part as we ascend towards the shaft. The cells at the shaft become suddenly condensed and elongated, as we have before mentioned, become hard, and, as it were, extra-vital. The outermost layer of the fibrous portion is thus formed. A single layer of the cells ascending from the bulb to form the fibrous portion, assumes an arrangement like that which is given to the tiles on the roof of a house. As we get higher in the shaft these cells become more and more flattened, and, consequently, the overlappings of the cells upon each other are less and less perceptible, though still to be recognized by the delicate and wavy lines which pass transversely at short intervals around the shaft. In the larger hairs we may not unfrequently get a double series of these imbricated scales —an outer and an inner, interlocking one another like the teeth of a cogged wheel; and the outer series is, no doubt, a condition intermediate between the true bark of the shaft and the cuticle of the follicle. The double cuticular coating is found only in the lower part of the hair—at the root, the shaft and root of the hair above the part where the inner root-sheath terminates being the single, simple, and

Imbricated scales of human hair in fœtus.

firmly-adherent membranous layer we have described.

The imbricated scales may be separated by treating the hair with an acid or an alkali. In the newly-born infant they are very distinct, and may be seen to have their free margins directed towards the unattached extremity of the hair.

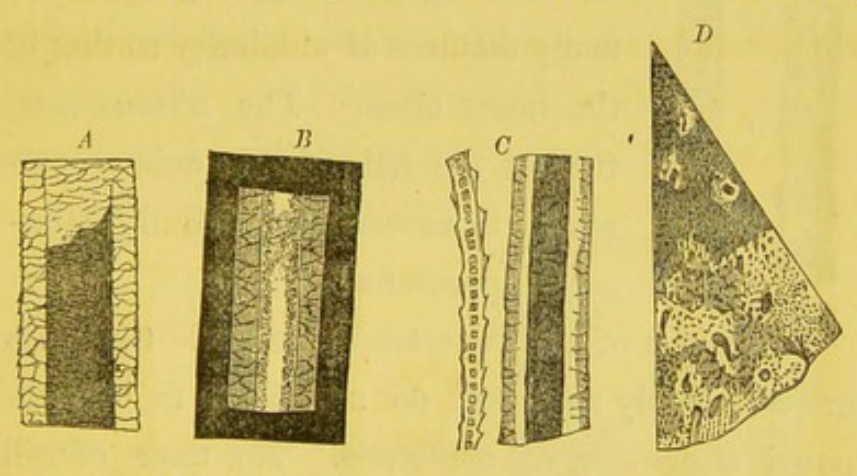
This imbrication of the scales of the cortical portion of the hair-shaft attains sometimes peculiar characters in some animals, whose hairs accordingly



A. Hair of the bat. Peculiar arrangement of the cortical scales.
B. Whorled arrangement of the cortical scales. Hair of Indian bat.
C. Cortex. Hair of Australian bat.

become beautiful microscopic objects. The feature is suffiicently remarkable in the hair of the common bat, and in that of another of the Cheiroptera, the Australian bat; but it attains a still more

striking development in that of the Indian bat. The scales of the cortex are here seen to be grouped in whorls set round the shaft at regular intervals, like the leaves around the stems of some plants. In the Carnivora the structure of the hair manifests much variety: the medullary cells are numerous, and the air-spaces small in size but aggregated closely together, as is seen in the cut representing the hair of the lion and bear.

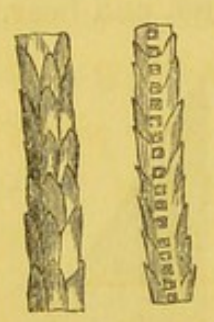


A. Hair of the lion, seen by transmitted light.
B. By reflected light.
C. Hair of the bear (*Ursus arctos*).
D. Hair of the Indian elephant.

In the elephant we find the hair presenting the development corresponding with that of the skin, being, as is this latter, extremely thick. Each hair resembles a number of hairs all fused together. Throughout the substance of the hair are small pale spots, formed by cells devoid of pigment, and around these cells are innumerable cortical cells, in

which an abundance of pigment may readily be observed.

We have said that the cells of the medulla appear falsely to contain pigment. But the pith of certain hairs does occasionally display colouring matter, and in certain of the Rodent animals we do not deny but that pigment is sometimes found in the medullary as well as in the cortical cells. And in

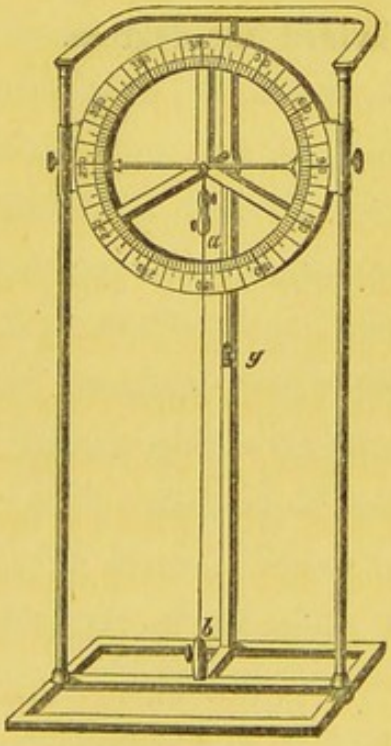


the hair of the kangaroo there are many features of similarity to that of the latter class. The fibrous portion of the hair of this animal presents, moreover, a beautifully imbricated appearance.

In certain of the Invertebrate animals the hairs are completely solid and do not seem to be composed altogether of epidermis. No trace of cell structure can in these cases be recognized, and it is a matter of speculation whether this appearance is due to the amorphous condition of the constituent epidermis. The presence of the imbrications, denoting the building up of the hair in a jointed and definite manner, explains the varied sensations of touch experienced on drawing the hair through the fingers, first in a definite and then in the reverse direction.

The reader can therefore readily understand how it happens that the manufacturer of ornamental hair sets so different a value upon what are technically called *combings* to that fixed by the public. However precious these *combings* may be to the individual, they are of little value to the manufacturer, seeing that, from this peculiar *tile-like* arrangement of the bark-cells of the hairs, it is impossible to work them up until all the roots and points are placed respectively together, for if only half-a-dozen roots be misplaced with the points the whole soon works into an entangled mass.

Besides its remarkable tenacity, the hair possesses other peculiar properties termed hygrometric. Gelatine, abundant in the hair, like all animal principles, readily absorbs moisture. Hair, consequently, does so too, and advantage of this property was taken by De Saussure in the construction of his Hygrometer, an instrument for determin-



ing the amount of moisture present in the air by the lengthening or shortening of a human hair under different atmospheric conditions. The figure represents the hygrometer of De Saussure; *a b* is the hair, which has been steeped in alkali to free it from its oil, and which is kept stretched by the weight, *g*. To shorten the hair as much as possible, the instrument is placed under a receiver, in the presence of some absorbent substance, as dry caustic alkali. It is then made to assume its greatest length, by being placed in a receiver saturated with aqueous vapour. Its greatest elevation is marked upon the circle, and the intermediate space between the two points is divided into degrees.

CHAPTER VIII.

THE HAIR OF THE DIFFERENT RACES OF MANKIND.—THE FOLLY OF SHAVING.

AUTHENTIC records, according to Sir G. Cornewall Lewis, do not extend so far back as the time of our first parents, or we might have been able to draw from them many points of great interest on the hair and other personal advantages of the first woman. But what is denied to the conscientious seeker after Truth is at once revealed to the imagination. Poets have wrapped themselves in ecstacy at the contemplation of the naked and untrammelled natural beauties of Eve—and, be it borne in mind, never forget the hair. Some picture to themselves the style of coiffure our first mother found most congenial to the tastes of her husband. Sometimes, we read, she tied up her tresses with a tenacious fibre and bound her brows with a garland of roses. At other times she affected ivy leaves. This must have been when she was desirous of assuming the appearance of an injured yet dignified woman. Sometimes her long tresses, allowed to flow unbound,

descended to her feet, forming a veil more brilliantly beautiful than that of Khorassan's prophet, and lighting up her eyes with a supernal and bewitching lustre. Adam must have been a happy and a proud husband. Listen to Moore:—

> "She, who brought death into the world,
> There stood before him with the light
> Of their lost Paradise still bright
> Upon those sunny locks, that curled
> Down her white shoulders to her feet."

Can any one venture to deny that it was the hair that made her beautiful? Adam had white shoulders of his own. But the hair down to the feet! Think of that, ladies who tie on tags and friz out the hair at the sides with the ——! No wonder the poor man fell! And Milton again, informed by the light of his fervid imagination, has instructed us upon the relative lengths of the hair of the first couple.

> "His fair large front and eye sublime declared
> Absolute rule; and hyacinthine locks
> Round from his parted forelock manly hung
> Clustering, but not beneath his shoulders broad.
> She, as a veil down to the slender waist,
> Her unadorned golden tresses wore
> Dishevell'd, but in wanton ringlets waved
> As the vine waves her tendrils."

Dr. Charles Pickering has classed mankind into

eleven families. The first, or Arabian, has straight or flowing hair. The Abyssinian has the hair crisp. The Mongolian has the hair very straight and very long. The Hottentot has close woolly hair. The fifth, or Malay family, has straight or flowing hair. The Papuan has the hair crisped or frizzled. The hair of the Negrillo, or seventh family, is woolly. That of the Ethiopian is crisp. That of the Australian straight or flowing, and the hair of the Negro is close and woolly. In fact, many important differences present themselves, in calling attention to which we shall avail ourselves of the work of that eminent ethnologist Mr. Rowland.

In the Caucasian races the hair, both upon the scalp and body, is abundant and black. In the Turkish or Scythian race the hair is, for the most part, dark and long, and strong in its texture. The hair of the Arabian or Semitic family is almost always black, and the beard not unfrequently has a reddish tinge; the scalp hair is long and lank. In the tribes of the human family inhabiting Northern and Eastern Asia, the eyelashes are almost absent, the eyebrows are scanty, and the hair of the head is thin and straight, and black in colour. The Laplanders have black, short, and thin hair. The Permians, Votiaks, and other tribes of Northern

Russia have hair of a chestnut brown. It is among these tribes that the fiery red hair is most common. The women among the Vogsals and Ostiaks seldom, however, have red hair.

The Tcheremiss, dwelling by the Volga, have a scanty beard. The hair is light, and so is that of the Morduins, the most South West of the Finny Tribes, while the hair of the Tchuvatch is black and curled.

The most hairy people in the world are certain Asiatics, natives of the Kurile Islands. Their beards, according to certain travellers of credibility, hang upon their breasts, and their arms, neck, and breasts are covered with hair; on the other hand, the Mongolian is pre-eminently beardless, oftentimes to extreme age no hair can be detected on the chin. He seems to make up for this deficiency by the length of the hair of the head, which not seldom touches the ground.

The Papuas of the Malay family of the human race have very thick and woolly hair, which they wear for the most part in large twisted masses. The Alfornons have straight, lank, and black hair. as likewise have the Polynesians. Among most of the Oceanic islanders the beard is scanty: the hair has often a rusty tinge, and is not unfrequently

matted so as to be altogether unassailable by the comb.

Mr. Catlin tells us that, out of 48 tribes of North American Indians, he found no less than 18 to 20 destitute of any vestige of a beard.

The absence of the beard in this race of men appears to furnish the only rational argument for the outrageous custom of shaving. When we consider that perhaps half the whole of the civilized races are sedulously engaged from 7 till 8 A.M. daily, in lacerating and torturing themselves to the verge of madness, in accordance with an edict of custom, we scarcely know whether to laugh at the folly of mankind, or to admire the unquestioning compliance with so monstrous a tax on their patience and comfort. We smile at the simplicity of costume adopted by the King of the Tahitians, we pity the Tartars who think heaven inaccessible, unless the scalp is denuded weekly, and yet, be what or who he may, there is scarce an Englishman but sacrifices to this barbarous caprice every day of his life. We know a distinguished professor of anatomy who is accustomed to say in his lectures that 365 shaves are equal collectively, in the torture they inflict, to one confinement. We believe

this is too liberal an estimate of the matter, and that if an accouchement were really attended by such an amount of anguish as this calculation would pre-suppose, none other than a Spartan would ever give birth to two children.

But shaving involves not only an intolerable amount of anguish, but an actual loss of otherwise valuable time. Campbell believed that a man at 70 has wasted as much time shaving as would have sufficed to enable him to acquire seven languages. Southey, in "The Doctor," tells us in his own charming and eccentric way, that he found, on accurately timeing himself, he consumed nine minutes in the shaving process. "As to my beard," says he, "it is not such a beard as that of Domenico d'Ancona, which was *delle barbe la corona*, that is to say, the crown of beards, or rather in English idiom, the King.

> 'Una barbe la più singulare
> Che mai fosse discritta in versa o' a prosa.'

And of which Berin says that the barber ought to have felt less reluctance in cutting the said Domenico's throat than in cutting off so incomparable a beard. Neither do I think that mine, even by

possibility, could vie with that of Futteh Ali Shah, King of Persia at this day; nay, I doubt whether Macassar oil, bears' grease, elephants' marrow, or the approved receipt of sour milk with which the Persians cultivate their beards, could ever bring mine to the far inferior growth of his son's, Prince Abbas Mirza. Indeed, no Mussulman would ever look upon it as they did upon Mungo Park's, with envious eyes, and think that it was too good a beard for a Christian. But for a Christian, and moreover, an Englishman, it is a sufficient beard; and for the individual a desirable one: *nihil me pœnitet hujus barbæ:* desirable, I say, inasmuch as it is in thickness and rate of growth rather below the average standard of beards. Nine minutes, therefore, will be about the average time required for shaving by a Zebedeean,—one who shaves himself. A professional operator makes quicker work; but he cannot be always exactly to the time, and at the year's end as much may have been lost in waiting for the barber, as is gained by his celerity of hand."

Assuming then the moderate average of nine minutes: nine minutes per day amount to an hour and three minutes per week; an hour and three minutes per week are fifty hours, thirty-six minutes per year.

We will suppose that our shaver begins to operate every day when he has completed his twentieth year; many, if not most men, begin earlier; they will do so, if they are ambitious of obtaining whiskers; they must do so if their beards are black, or carrotty, or of strong growth. There are then 50 years of daily shaving to be completed, and in that time he will have completed 2730 hours in shaving himself. Dividing this number by seven, we have 390 hours for learning each language; 390 lessons of an hour long,—wherein it is evident that any person of common capacity might, with common diligence, learn to read, speak, and write sufficiently well for all European purposes any European language.

Since the Crimean war, this mania for shaving—which, it may be stated, is a vain attempt on the part of man to prevent the growth of eight feet of hair from the chin during twenty-five years of his life—has considerably abated. Not that the old prejudice has altogether died out; for we find, now that time has somewhat dimmed the heroic deeds of our troops, and that military fashions are not so affected as they were during the campaign, that here and there the Dombeys of our mercantile

firms, and the Stigginses of the pulpit are stickling for the razor as zealously as the Jacobites did for the Test Act. Nevertheless, on the whole, more beards and moustachios are worn than used to be the case. And no small share of the present change is due to the medical profession. They have very persistently set forth the advantages of which those who shave deprive themselves: although, with an inconsistency but too demonstrative of the force of conventionality and expediency, they are, perhaps, as great shavers as any other class of men. But it is now generally known, that consumption is far more prevalent among, for example, stone-cutters who shave, than among men pursuing the same occupation who do not shave. And the statistics of the diseases to which men are subject who are much exposed to sudden alterations of temperature, and to protracted cold, leave no room for doubting the beneficial influence of hair upon the lip and chin in preventing bronchitis, pneumonia, and pleurisy. Much has been written, in ancient and modern times, in favour of the beard: the Bible and Nature clearly point out the propriety of wearing it. In this respect, as in every other, it would be well if those who profess Christianity followed the example of its Founder; for, speaking, we trust

not irreverently, it is sufficiently evident, from the paintings which have been handed down to us, that a beard was worn by the Saviour of mankind.

"Be not so mad," says Quarles, "as to alter that countenance which thy Creator made thee. Remember, it is the work of his hands. If it be good, why dost thou mar it? Art thou ashamed of his work, and proud of thine own? He made thy face to be known by: why desirest thou to be known by another? It is better to be his picture than thine own."

The history of the beard, and its various fashions, is by no means uninteresting; but our present purpose is to show its utility: its ornament is sufficiently obvious to every artistic eye. We may readily conceive the beauty of Aaron's beard, which is alluded to by the Psalmist, and on which the precious ointment is described as flowing from the head: so that the anointing of the hair, even at that remote period, was evidently considered a matter of some importance.

Mr. Charles Dickens, in his *Household Words*, has given a suggestive article on the subject of beards. And in concluding our remarks on this ornament to the countenance, we cannot, perhaps, do better than introduce the views of this popular

writer. He says:—"In the world's history, the bearded races have at all times been the most important actors; and there is no part of the body which, on the whole, they have shown more readiness to honour. Among many nations and through many centuries, development of beard has been thought indicative of the development of strength, both bodily and mental. In strict accordance with that feeling, the strength of Samson was made to rest in his hair. The beard became naturally honoured, inasmuch as it is a characteristic feature of the chief of the two sexes, (I speak as an ancient,) of man, and of man only, in the best years of his life, when he is capable of putting forth his independent energies. As years multiply, and judgment ripens, the beard grows, and with it grows, or ought to grow, every man's title to respect. Grey beards became, thus, so closely connected with the idea of mature discretion, that they were taken often as its sign or cause; and thus it was fabled of the wise king Numa, that he was gray-haired even in his youth.

"It may be asked, if beards and whiskers serve a purpose, why are they denied to women? That is a question certainly not difficult to answer. For

the same reason that the rose is painted and the violet perfumed, there are assigned by Nature to the woman attributes of grace, heightened by physical weakness, and to the man attributes of dignity and strength. A thousand delicate emotions were to play about the woman's mouth, expressions that would not look beautiful in man.

"Moreover, man is born to work out of doors, and in all weathers, for his bread: woman was created for duties of another kind, which do not involve constant exposure to sun, wind, and rain. Therefore, man only goes abroad whiskered and bearded, with his face muffled by nature in a way that shields every sensitive part alike from wind, rain, heat, or frost, with a perfection that could be equalled by no muffler of his own devising. The whiskerless seldom can bear long exposure to a sharp wind that strikes on the bare cheek. The numbness then occasioned by a temporary palsy of the nerves has, in many cases, become permanent. I will say nothing of aches and pains that otherwise affect the face or teeth. For a man who goes out to his labour in the morning, no better summer shield or winter covering against the sun or storm can be provided than the hair which grows over

those parts of the face which need protection, and descends as beard in front of the neck and chest; a defence infinitely more useful as well as more becoming than a cravat about the neck, or a prepared hareskin over the pit of the stomach."

CHAPTER IX.

ON THE FUNCTIONS OF THE HAIR.

ALTHOUGH anatomical investigation shows definitely that in man the true hair is not penetrated by vessels and nerves, yet it also convinces us that the hair is an admirably organized body, maintaining a vital, though not a strictly vascular, connection with the scalp—that is to say, that the hair is dependent for its growth upon vital force at the seat of the follicle, and that such force is expended in supplying the epidermic cells with those juices upon which the vitality, small though it be, of the cells and scales of the follicle and hair depends, and which the blood must necessarily contain. The hairs have an organization, a definite arrangement and mode of growth of their elements; their fibrous portion, we now know, is a peculiar transitional condition of the cells at the bottom of the follicle. The medullary portion is formed by the same cells, which derive, in accordance with obscure laws of growth, no tendency to become fibrous. The bulb of the hair is constituted by cells, whose

dimensions are considerable from distension with the fluids imbibed in obedience to their absorbing function; while it is in the bottom of the hair-follicle and the papilla, where it manifestly exists, that that power has its seat which supplies the material necessary for the structure. The hair, therefore, is, to all intents and purposes, a secretion; —a secretion of epidermic cells from a receptacle, itself lined with secreting epidermic cells: containing at its base a rudimentary papilla, in which those nerves essential for functional secretive activity are encased, and of a vitality in intimate dependence upon its vicinity to the vascular textures. The thickness of the hair, in our judgment, depends on the abundance of the secretion; the length of it upon the conservation throughout the extent of the hair of the integrity of the medullary cells, which alone are sufficiently loose to allow of the absorbtive process.

There are two kinds of secretion usually recognized—one a secretion destined to fulfil some beneficial purpose; one noxious if retained, and which is, therefore, during health, thrown out forthwith on its formation. The gastric juice is a secretion of the former kind. The latter secre-

tions are termed excretions; and, to our thinking, hair holds an intermediate place between the two. It is secreted and excreted; but for a time it retains its connection with the system of which, however, it no longer forms a physiological part. That it is not entirely an excretion is evident from the fact, that in its natural state it affords traces of vitality, which, in certain conditions of the scalp, indeed, denote the actual presence of life in the hair. It has been pointed out by Mandl, and we have, in a vast number of instances, verified the observation, that the hair, when cut, becomes pointed. This pointing consists in a lengthening out and condensation of the cells at the extremity, which, were it not for their truncation in cutting, and the subsequent calling into activity of the latent powers of growth which the remnant of vitality bestows, could not take place. And in a disease of the hair, termed *plica Polonica*—which is brought about by the filthy habits of the Poles, whose hair becomes matted together by the glutinous secretion the hair follicles throw out under the irritation of dirt—it is not uncommon for the hair to bleed when cut. The irritation not only augments and vitiates the secretions of the sebaceous and hair

follicles of the scalp, but induces a hypertrophy, or enlargement of the vessels, which ramify in the follicular papilla.

And if it were not for the vitality of the hair, it would not be possible to explain those peculiar phenomena of sensation which it not unfrequently exhibits, and of alterations of colour which the different passions have at times been seen to bring about. We say nothing of the movements of the hair under the influence of sudden terror; for such unquestionably depend on the sudden contraction of the reddish fibres of the corium, which we have spoken of in describing the fibrous tissue of the skin. We allude, particularly, to those cases where severe pain is felt on cutting the hair; a disturbed condition of sensation which could not be present but for the existence of nerve fibres. And instances are on record of certain constitutional effects having been brought about by cutting the hair, which can only be explained by an assumption of its vitality. Bichat says that he has witnessed a fatal result from cutting the hair, and a similar statement has been made by M. Louroix. Now it was not to be supposed that these untoward accidents arose from the contact of the air, for care was taken to keep the heads of these patients well covered. Nor can

it proceed from the attraction, by the cropped hair, of an undue share of vital activity; but it is the result of an active sympathy exerted by the hair upon the systemic organs; and as every sympathizing organ is endowed with life, so, consequently, must the hair be. That hair is not extra-vital, is shown by the influence of cutting the hair upon many so-called nervous headaches. When cut, growth is stimulated, and the stagnant juices of the bulb and adjoining shaft are set in motion. A friend of Valsalva, Morgagni says, dispelled a maniacal affection by having the patient's head shaved; and beneficial results from the same process are frequently seen in the lunatic asylums —results which, it must be confessed, lend some force to the injunction so frequently conveyed to demented persons, although not showing very clearly why they should proceed to Bath to act up to it.

It is especially with reference to the gradual and even sudden alteration of colour that we obtain evidence of the vitality of the hair—evidence which, indeed, goes far to show the dependence of even the colour upon nervous influence. For, granting that the permeability of the medullary hair cells by fluids explains the whitening of the hair, when

acted upon by some peculiar chemical, it is as reasonable to suppose that the pigment itself owes its existence to nervous influence as that the chemical is so derived.

It is related that the hair of two gentlemen,—one a native of Languedoc, the other a Spaniard,—became perfectly white in a single night through fear of death, to which they were condemned for political offences. Daniel Turner, quoted by Erasmus Wilson, says: "Don Diego Osorius, a Spaniard of a noble family, being in love with a young lady of the Court, had prevailed with her for a private conference under the shady boughs of a tree within the garden of the King of Spain; but by the unfortunate barking of a little dog their privacy was betrayed, the young gentlemen seized by some of the king's guard, and imprisoned. It was capital to be found in that place, and therefore he was condemned to die. He was so terrified at the hearing of his sentence that one and the same night saw the same person young and old, being turned grey as in those stricken in years. The jailor, moved at the sight, related the accident to King Ferdinand as a prodigy, who thereupon pardoned him, saying he had been sufficiently punished for his fault." Another instance there is from the same author, re-

lating to a nobleman who "was cast in prison, and on the morrow after ordered to lose his head; he passed the night in such fearful apprehensions of death, that the next day, Cæsar sitting on the tribunal, he appeared so unlike himself that he was known to none that were present—no, not to Cæsar himself: the comeliness and beauty of his face being vanished, his countenance like a dead man's, his hair and beard turned grey, and in all respects so changed, that the Emperor, at first, suspected some counterfeit was substituted in his room. He caused him, therefore, to be examined if he were the same, and trial to be made if his hair and beard were not thus changed by art; but, finding nothing counterfeit; astonished at the countenance and strange visage of the man, he was moved to pity, and mercifully gave him pardon for the crime he had committed." And among many instances there is a third case of "an Irish captain, who coming to deliver himself up to my Lord Broghil, commander of the English forces in those parts,—according to a pardon proclaimed to those Irish that were willing to surrender themselves and lay down their arms,—he was casually met, with some of his followers, by a party of English, and intercepted, the governor being then absent, upon which, the poor captain was so apprehensive that he

should be put to death before my lord's return, that the very fear and anxiety of his mind quickly changed the colour of his hair in a peculiar manner, not uniformly, but interspersedly among some of his locks, which were turned perfectly white, the rest of them retaining their wonted reddish colour."

"I was struck," says Madame Campan, "with the astonishing change misfortune had wrought upon Marie Antoinette's features: her whole head of hair had turned almost white during her transit from Varennes to Paris." And it is stated that the Duchesse de Luxembourg, being put in prison subsequent to attempting her escape during the French Revolution, was found with her hair whitened the morning after her incarceration. And another example occurs in the work of an eminent archæologist: "A Spanish officer, distinguished for his bravery, was in the Duke of Alva's camp, and an experiment was made by one of the authorities, to test his courage. At midnight, the provost-marshal, accompanied by his guard and a confessor, awoke him from his sleep, informing him that, by order of the Viceroy, he was to be executed, and had only a quarter of an hour left to make his peace with heaven. After he had confessed, he said that he was prepared for death, but declared his innocence. The provost-

marshal, at this moment, burst into a fit of laughter, and told him that they merely wanted to try his courage. Placing his hand upon his breast, and, with a ghastly paleness, he ordered the provost out of his tent, observing that he had done him 'an evil office;' and the next morning, to the wonder of the whole army, the hair of his head, from having been of a deep black colour, had become perfectly white."

Anxiety is capable of blanching the hair, if we may judge from the example of "a banker, whose hair became grey in the course of three days, when under much anxiety during the great panic of 1825." But it would seem that other influences may be efficient besides the depressing emotions, if we credit the fact, that "a gentleman who, at his marriage, when about forty years old, had a dark head of hair, but, on his return from his wedding trip, had become so completely snow-white, even to his eyebrows, that his friends almost doubted his identity."

Whatever doubts may be entertained of these sudden changes of colour, there can be none as to the gradual alterations undergone by the hair in this particular. It is sufficient to recall to mind the case of any friend who, to our knowledge, has

for some considerable time been much harassed in his mind, and the probabilities are very strong that we shall observe the hair to have become grey or white. This loss of colour may, indeed, also be observed in great frequency in ageing people; and, inasmuch as the effect is the same, and, in the latter case, is manifestly due to a failure of vital power, and of the integrity of the nutritive processes, it seems unreasonable to suppose, with Vauquelin, that the blanching, when sudden, is due to the operation of a rapidly developed chemical re-agent. This chemist supposed that, during the disturbance of the normal functions, through a shock to the nervous system, an acid of a bleaching property was generated, and acted on the pigment.

According to Vauquelin, the colour of the hair depends on the presence of a peculiar oil, which, in dark hair, is of a sepia tint, yellowish in light hair, and blood-red in red hair. When extracted, as it may be by ether, the hair assumes a greyish colour.. From a chemical point of view, therefore, the production of grey hair depends upon the blanching of the oil or the abstraction of it. Our own opinion, however, is based more upon the vital properties of the hair cells, and we believe that greyness and whitening of the hair depend upon

a *paralysis of absorption on the part of the epithelial cells*. We see no more reason to conclude that a purely chemical view should be requisite to explain the absence of colour from the cells of the cortex, than that it is necessary to account for the absence of urea in the secretion of the kidneys when the epithelial cells of these organs are, either gradually or suddenly, paralysed by disease or injury. Another view, of some plausibility, explains the whitening of the hair by assuming a sudden absorption of the fluid in the minute capillary vessels. But such a view is opposed to physiological teaching, which shows that when nerve-influence is withdrawn, absorption, as a function, ceases.

Vauquelin's view, that the colour of the hair is due to an animal oil with which it is impregnated, is entertained by the best chemists of the present day. The chemical constitution of the hair is intimately allied with that of horny matter, such as cow-horn, tortoise-shell, whalebone, the claws of beasts, the nails of the fingers and toes, the scales of fishes, the feathers of birds. The material composing the harder cells is intermediate in composition between the albuminoid and gelatinous components of the body. It contains less

carbon and more nitrogen and sulphur than the albumino-fibrinous group. The following is the ultimate composition of horny matter, according to Scherer:—

Carbon	50·62
Hydrogen	6·80
Nitrogen	17·22
Sulphur, Oxygen, &c. . . .	24·94
	100·00

The quantity of sulphur is very considerable, and amounts to as much as five per cent.; and it is most probably owing to the presence of this element that hair, when burned, evolves its peculiar odour. Sulphur and hydrogen, when united to form sulphuretted hydrogen, give out a most abominable smell, resembling that of rotten eggs. But Erasmus Wilson, is unquestionably in error in stating that the basis of hair is albumen. Albumen contains phosphorus—an element of which no trace can be found in the animal ingredient of the hair.

The inorganic constituents of the hair amount to as much, occasionally, as seven per cent. They may be estimated by weighing the ash of the calcined hair, and are found always to contain silica, the peculiar hard oxide of which flint is composed.

The percentage of ash stated above is, however, seldom attained, and the mineral constituents of the hair of the scalp can scarcely be said to exceed more than two per cent., of which silica constitutes fully one-seventh. It is but of little practical importance to know that fair and dark hair differ in the respective quantities of carbon and hydrogen they contain. But it may satisfy the curious to learn that fair hair yields to analysis a large proportion of oxygen and sulphur, while brown and black hair abound in carbon and hydrogen. Carbon is more abundant in brown hair than in black, and hydrogen is found in larger quantity in black hair than in brown. It may be interesting to note that comparative differences exist between the hair of the head and that of the beard; the latter is richer in carbon and hydrogen, and poorer in oxygen and sulphur.

An attempt has been made by an eminent authority to show, from the chemical composition of the hair, that this structure subserves a function of separating a large quantity of carbon and hydrogen from the system, and that it assumes a high importance in counterbalancing deficient elimination of these substances by the other organs of the system which are in a healthy state concerned in removing

them. But we have shown that the hair is not an effete structure, and that its components cannot, until the hair leaves the scalp, be viewed as thrown out of the system. The growth of the hair is, on the contrary, intimately related to the energy of the vital forces, and dependent, in our opinion, upon organic nervous supply; which would be very much less than it is, if the hair were merely instrumental in casting off effete material.

CHAPTER X.

NERVOUS ELEMENTS OF THE SCALP.

SENSATION is imparted to the scalp; circulation is controlled throughout the ultimate vascular ramifications that convey nutritive blood to the scalp; growth and decay are harmonized throughout the scalp by means of the nervous system, whose terminal offshoots both supply the skin itself, the glands that moisten it, and the vessels that ramify throughout. By means of the nerves, touch is imparted: molecular change, in obedience to obscure vital laws, persists: and the temperature of the scalp is maintained at a degree varying from 90° to 95°.

The offices of the nervous supply to the scalp are, it will consequently be seen, partly in immediate dependence upon the mind, and partly upon vital laws, independent themselves of a sentient mental condition. Thus, were it not for the mind, the scalp would be unable to feel. But circulation can readily go on when the mind itself is dormant. The mind being healthy, and the nerves that reach from the brain to the scalp being likewise healthy,

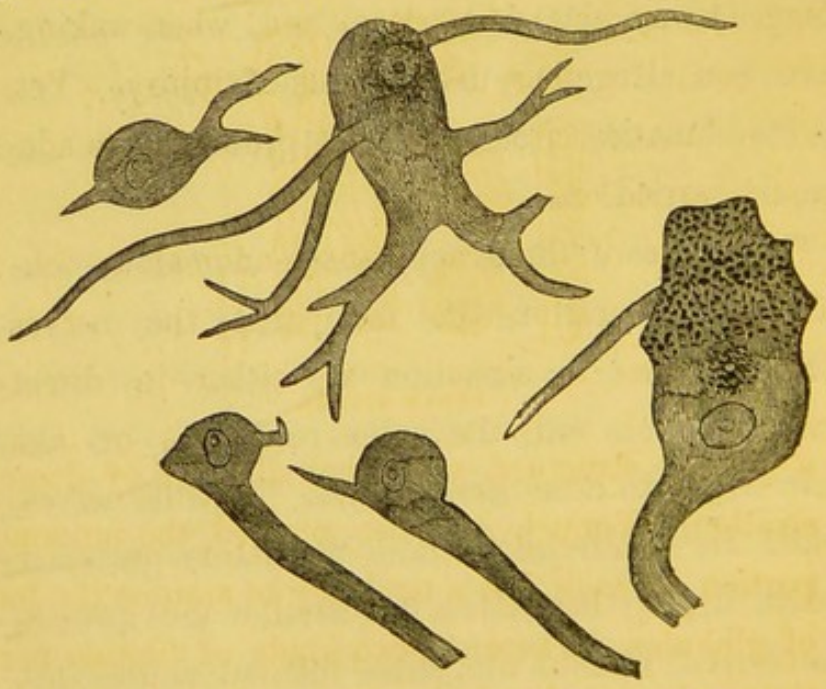
the faintest impression upon it is immediately perceived. But where the mind is disordered, or the integrity of the nerve threads, that stretch like telegraph wires from the remote districts to the central station, is impaired, all tactile function is, if not in abeyance, perverted, more or less. Cases are not unfrequent in our lunatic asylums of terrible injuries being sustained in this region without the slightest apparent pain. Lunatics have been known to put their heads between the bars into a blazing fire, and there remain until the whole scalp was charred to a cinder, and yet so free from pain were the unfortunate creatures, that they have been dragged away while fast asleep, and, when waking, have been altogether unconscious of injury. Yet, in these lunatics circulation and growth were adequately carried on.

The cause of these apparently anomalous conditions is found in the fact, that the nerves which minister to sensation are either in direct communication with the spine or brain, or take their origin in those nerve centres. But the nerves, which are subservient to those circulatory processes which display themselves in secretion and growth, are derived from an altogether different source, in a great nervous centre, situated outside the spine,

called by anatomists the organic or sympathetic system.

It is not, therefore, improbable that an examination will disclose a material difference in the intimate structure of nerves derived from these respective sources. That is to say, that a spinal or cerebral nerve and sympathetic nerve will respectively display, under the microscope, characteristic and remarkable points of difference; and be it borne in mind that the scalp is furnished with both varieties.

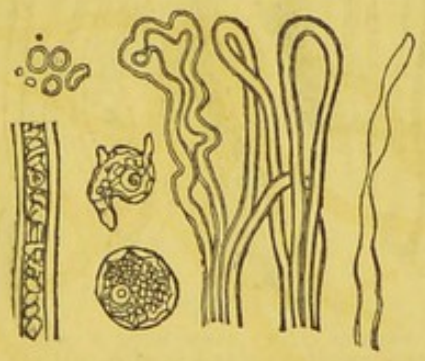
The nerve substance itself, of which nerves, whether derived from the cerebro-spinal or organic system, are made up, is a kind of fat. It is greasy,



Elements of gray nervous matter, or ganglion globules, with their processes nuclei and nucleoli.

it is soft, it is of slight cohesion, it is rich in fatty matter. It exists, moreover, under two distinct conditions, termed the vesicular nerve matter and the fibrous nerve matter. The former variety needs no details in this place, inasmuch as, though present in great abundance in the nerve centres, it is never found in nerves properly so-called. It is, however, we may observe, gray in colour, and very abundantly supplied by blood-vessels.

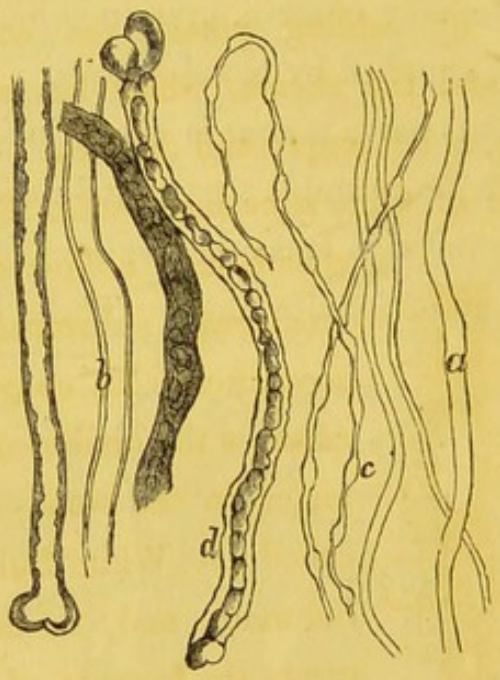
The fibrous nerve matter is the principal constituent of the innumerable nerves and nerve branches that supply the skin and other textures of the scalp. It is made up of definite fibres. These latter have



NERVE FIBRES.

a defined structure, somewhat difficult of demonstration, inasmuch as when pressed, the innermost portion of each has a tendency to assume the form of globules. There are two kinds of fibrous nerve tissue, the tubular nerve fibre and the gelatinous

nerve fibre, to each of which we direct attention, inasmuch as both kinds are present in the scalp—the latter more especially in the branches of sympathetic origin. Placed on the field of the microscope, and allowing the light to impinge upon the object, and thence to the eye, a tubular nerve fibre, when quite recent, appears of a pearly hue, and



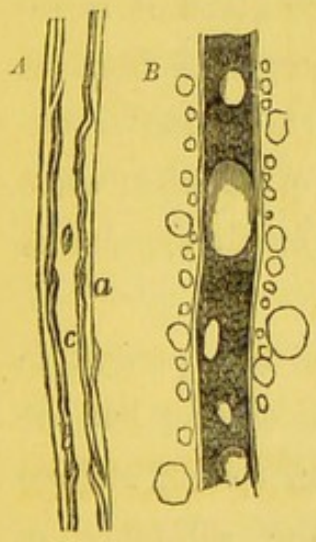
Nerve tubes, of various sizes; some as at *a*, with a single outline; others with a double outline as at *b*. Some as at *c*, varicose; others as at *d*, with the contents in a granular state.

altogether devoid of structure; but if the light be let to pass through the nerve to the eye this simplicity disappears, except in very small specimens, and an enveloping or tubular membrane, enclosing another tube of white substance, which again includes a

broader portion, to which the name of axis cylinder was given by Purkinje.

The primitive tubular membrane is an extremely delicate, transparent membrane, devoid of all apparent structure, and possibly possessing elastic properties. The best way to demonstrate its existence, is to treat the fibre with strong nitric acid, and afterwards by adding potash the contents are dissolved, and the sheath, which has a yellowish appearance, is left empty and distinct.

The tube of white substance within this external sheath is a hollow cylinder of tenacious substance, which, soon after death, coagulates and assumes the double outline depicted in the wood-cut. It is called the White Substance of Schwann, and, no doubt, subserves the purpose of shielding the innermost portion of the nerve and of isolating it in the same manner as the copper-wire is insulated by a non-conducting material for telegraphic purposes. It is this portion that is, in greater part, dissolved when the fibre is immersed



NERVE TUBES.

A. In water. *B*. In spirit.
a. Tubular membrane.
b. White substance of Schwann.
c. Nerve axis.

in other, and which, on the other hand, remains undissolved when placed in water. It is more especially to be noted, that this white substance attains its highest development in the nerves derived from the spine, and is very easy of detection in the nerves of motion that supply the scalp.

The central and essential portion of the nerve is found in the form of a band or stripe, which, more or less round in the living state, soon becomes flattened after death. It is, doubtless, elastic; its appearance is pale and transparent, and it is remarkably different in physical properties from its surrounding tube; for whereas the latter is unaffected by water, the contents of it, when acted upon by this fluid, forthwith take on the appearance of granules.

These tubular nerve fibres, are also present in the nerve bundles of sympathetic origin; but the majority of the fibres of the latter system, contain nothing analogous to the white substance of Schwann. They are not white, like the tubular fibres, but gray. They are also flatter and softer; and they are more especially characterized by the presence in them of numerous round and oval nuclei, which not unfrequently contain nucleoli,

and which, unlike the fibre itself, are not dissolved by acetic acid.

It is not by any means easy to trace nerves into the papillæ we described in the previous chapter. Some modern German writers have given very succinct and minute details on this subject, and have described a looped arrangement, as occurring in the minute organs, which English observers have not been fortunate enough to see. The fibrous tissues of the cutis, through which the nerves have to pass to reach the papillæ, oppose themselves very effectually to attempts to follow them to their ultimate destination. Some of our best microscopists have failed to do more than verify the fact, that a solitary nerve tube ascends into a papilla, to about half-way to the summit, and then ceases to be visible. Either, therefore, the nerve abruptly comes to a termination, or it can no longer be discerned in consequence of having lost the white substance of Schwann, whose refracting powers alone secure its recognition among the other structures in the specimen.

It is of a higher importance, with respect to our own subject, that we should obtain a more exact knowledge of the anatomical disposition of the sympathetic nerve fibres than we possess with

respect to the sensitive and motor nerves. And, fortunately, we can do so with sufficient readiness; for the vessels whose circulation they control, and the glands to whose function they are immediately subservient, can be isolated with greater facility than the minute organs of special touch. On the coats of arteries nervous plexuses can be seen, from which minute filaments pass to the muscular and serous coats by perforating the outer wall, and thus bring the arterial tunics into immediate relationship with the nervous system.

No more appropriate or familiar instance of the influence of the nerves upon the circulation can be obtained than that afforded by the phenomenon of blushing. The emotion of shame, or of a kindred nature, acts instantaneously and even despite the will, in bringing to the cheek a large supply of arterial blood. Dilatation of the capillaries here most unquestionably takes place. Does this dilatation occur from withdrawal of nervous influence or by means of its sudden increase? Contrasting the redness of blushing with the pallor of fear, we perceive an entirely opposite condition brought about through the instrumentality of the same nerves; and whether in either case the nervous influence be increased or withheld,

the sudden changes in the vascular state of the part are undeniably due to the impression on the nerves. And, pursuing the subject, we shall have reason to believe that the nervous system plays not only an important part in modifying the circulatory process, but an indispensably essential part in instituting and maintaining function throughout the entire system, which displays itself in secretion wherever organs exist for its manifestation.

It is a common physiological tenet that modern science has added to the stock of previous knowledge, that not only is nerve force generated during the passage to the tissues of nutritive material from the blood, but that in the ordinary molecular changes that are ceaselessly active in transforming those nutritive matters into living textures, a force is generated which itself promotes the circulation of the blood through the minutest capillaries. This nerve-force and the circulation are consequently mutually dependent. The blood, as it flows, gives up nutritive material to the tissues, which, in like manner, give up to the blood the products of their own decay. In the conversion of the materials afforded into living texture nerve-force, or a subtle force thereto allied, is generated;

and it is by this very force that the nerves themselves are enabled to induce that continuous circulation by means of which that ceaseless supply of material is furnished, to the transformation of which the force itself owes its origin.

Tracing these principles to their legitimate inferences, we are enabled with reference to the scalp to discover both the conditions on which its healthy condition depends, and the causes which induce those failures of functional activity which display themselves in losses of the hair. For it is evident that, since the hair itself is the product and evidence of integrity of the supply of blood, from which alone the hair can be derived, so its loss is irrefutable evidence to the failure of that supply of organic nervous force from the sympathetic system, on which we know the circulation itself depends. But the term nutrition has a much more extended signification in our mind than is generally understood by the conversion of blood elements into living texture. It includes, we say, the full elaboration and building up of the secretions of the body, whether those secretions be like that of the liver, destined to be in part re-absorbed, or whether, like that of the kidney, they are altogether excrementitious. We believe that for the genera-

tion of the subtle force we have spoken of, it is as necessary that the transformation of materials into secretions should take place, as of other materials into flesh, blood, and bone. There is, we believe, as much force-producing work done to make hair as to make skin or muscle, and we boldly state that a failure of hair indicates as positively a derived deficiency of nerve force at the spot, as would be indicated at another spot by softening of a bone or mortification of the skin. Originally, possibly, the fall of the hair may be due to a deficiency of that material in the blood, whose transformation ultimately would result in hair; but eventually the hair fails to be produced, even if the materials exist in the blood, owing to a deficiency in the nerve force which, until its evolution was stayed, kept up the capillary circulation at the spot.

CHAPTER XI.

THE DISEASES OF THE SCALP.

It is very familiar knowledge that the scalp is subject to eruptions, and the hair to certain lesions; yet it is equally certain that until the last few years few even among medical men possessed so much as a tolerable acquaintance with the diseases of the scalp. A part of this ignorance had its origin in the confused and often contradictory description of these diseases given by both English and foreign authors, an evil which is only just now disappearing in the technical works on this subject. Thus under the term *Porrigo*, Willan and Bateman include several affections altogether distinct. Their *Porrigo larvalis* is simply a variety of *Impetigo;* their *Porrigo furfurans* is in the one case *Pityriasis capitis*, and in another a form of *Chronic Eczema*. It is, consequently, not uncommon to see, even at the present day, Eczema confounded with Impetigo, the one disease being vesicular, the other pustular. In France, the difficulty attendant on the diagnosis of scalp affections was for a long time got

over by putting them all under the generic term *Teigne;* and how much confusion has been caused by this inexact knowledge is evident in the case of M. Cazenave, who calls common ringworm *Herpes tonsurans*, which again is termed *Porrigo scutulata* by Willan and Bateman. M. Cazenave's error is due to the rare occurrence of ringworm in his own country, and the avoidance of it in this and other cases, at home, is only to be brought about by exact teaching and extended opportunities.

But though many of the consequences of such defective knowledge may be laid to the charge of the medical practitioner, the majority of them may rightly be ascribed to the public themselves. It is the rarest thing in the world for a patient to apply for advice in the earliest stage of scalp affections. Seldom attended with pain, the affection causes but little inconvenience. Out of sight, it is mostly out of mind, and displaying itself perhaps by a little itching, perhaps by a little scurf, the disease makes stealthy and certain footing before treatment is resorted to. Scalp affections and diseases of the hair are of more frequent occurrence among children than adults, and youthful patients are still more prone, from an aversion to the doctor, to conceal their infirmities than older sufferers. But

such indifference at all ages is likely to be followed by consequences the more unpleasant, that the patient by-and-by becomes aware that they might readily have been obviated. Thus, for example, baldness frequently follows when inflammation has attacked the secreting hair follicle, and it is only when the symptom displays itself, which shows that the disease has done its worst, that the least anxiety is felt by the patient. It should be borne in mind, therefore, that a scalp affection should never be trifled with or its cure deferred for a time, for it is mostly destructive and always insidious.

But whether the individual cares for his own appearance or not, it behoves every one having the charge of, or moral influence over, a patient in whom the least appearance of disease of the scalp presents itself to put such patient forthwith under special treatment; and for this reason, that he may be subject to an affection in itself highly contagious. The presence, for example, of a single case of ringworm in a family may result in its extension to every one of its members.

The anatomical details into which we have already entered, suffice to show the elaborate organization of the scalp and its appendages, and to account for its peculiar liability to eruptions of

various kinds. Its vessels we have found to be numerous, and derived from the principal arteries of the body. The scalp is, consequently, predisposed, from the abundance of its vascular supply, to inflammatory lesions and their consequences. Erysipelas is frequent after injury to the scalp, and is, with the exception of the face, more frequently met with in this region than in any other part of the body. The *Scall* and the *Tetter* are of very frequent occurrence. The sebaceous glands and sweat ducts existing, as we have seen, in prodigious quantities, sufficiently explain the disposition of the scalp to take on diseases to which they themselves are subject, and which result, as in *Favus*, in destruction of the hair. On the other hand, it is easy to perceive that as the scalp is the seat of rapid nutritional changes, both from the quantity of blood circulating throughout it, and the large amount of its fatty, areolar, and muscular tissues, any perversion of the nutritional action going on between them will readily give rise to morbid manifestations. The nervous supply around the vessels we have seen to be great, vital power, therefore, is readily impaired under such adverse circumstances. The induced disease is either, as in favus and impetigo, of a low type, or it has some slightly

salutary tendency through the discharge set up, as we find to be the case in eczema and pityriasis.

The interest attaching to the study of scalp affections from these several points of view sustains no diminution, from the theory of the vegetable origin of some of them, which has originated a vast amount of discussion, and has no little bearing on the question of contagion. The chief supporter of the vegetable theory in our own country is Dr. Jenner. Abroad many eminent dermatologists have given much attention to this subject, and lend the sanction of their names in support of the vegetable origin of several of these diseases. The presence of certain vegetable fungi in the hairs and hair follicles, in cases of favus, of sycosis, and in many species of porrigo, does not admit of doubt; but it is not altogether proved that they are the *causes* of those respective diseases. M. Grüby believes sycosis to be a cryptogamic plant. He finds the vegetations in all cases, and entertains no doubt on the subject. On the other hand, authorities of equal weight believe these vegetations to be results of the disease, which, though confessedly of frequent simultaneous occurrence, may yet be present without them.

Vegetable parasites have been shown to be pre-

sent in no less than five diseases of the skin, in four of which the vegetable is connected with the hair. These diseases are the Honeycomb scale, Ringworm, Porrigo decalvans, Sycosis, and Pityriasis versicolor. They occur for the most part in persons of that peculiar constitution to which the term scrofulous is applied; and reasoning on the observation that such a vitiated state of the system at least predisposes to their manifestation, Dr. Hughes Bennett is led to associate the parasitic vegetations of these diseases with tubercular matter. In his celebrated paper on the parasitic fungi he states: "In man all the vegetations yet discovered have been found connected with the matter effused into the textures in scrofulous constitutions. The fungi found by myself, for instance, growing in the tuberculous cavities of the lungs, and those discovered by Schönlein, and described by Grüby, constituting scrofulous eruptions on the skin, grew on a finely granular amorphous mass, which presented no evidence of organization. Chemical researches have shewn that this form of tubercular matter is principally composed of albumen, which explains the large proportion,of this animal principle present in the crust of the Porrigo, or Tinea favosa, according to the analysis given by Alibert.

"The fungi found by MM. Rousseau and Serrurier in the parroquet grew on a species of false membrane. What the nature of this membrane was is not stated, but it is distinctly mentioned that the animal died of laryngeal and pulmonary phthisis. In pigeons, also, the same authors describe it as commonly induced by exposure to cold and moisture, circumstances well known to be the most common cause of scrofula and of tuberculous depositions. According to the observations of Valentin, the parasitic confervæ found growing on fish are connected with a diseased state of the animal, and are induced by keeping them in narrow vessels and foul water. The gold fish was evidently unhealthy, which furnished the vegetations which I have myself described, and I have shown that these were connected with a granular, inorganic, albuminous matter, identical with that found in the lungs of phthisical individuals, and in the crusts of Porrigo favosa." During his investigations Dr. Bennett hit upon a very curious phenomena. He found an eruption of favus on the face of a mouse, a circumstance which stimulated him to further inquiry, with the object of establishing, if possible, some connection between favus and the mouse-like smell so characteristic of the disease in the human sub-

ject. In the mouse "the crusts were of a more irregular form, prominent in the centre, not forming distinct capsules, or perforated by a hair. They formed a prominent whitish friable mass on the left side of the face of the animal, about the size of a small bean. Examined microscopically they presented the cylindrical tubes and sporules *en masse*, in every respect identical with those which grow on the scalp of man.

RINGWORM is a disease of the hair and the epithelial lining of the hair follicle, to which several names have at different times been given by pathologists. Thus it has been termed by Willan, Porrigo scutulata; by Wilson, Trichonosis furfuracea; and by others, Tinea tonsurans. The latter term is perhaps the best of the three.

Ringworm is a chronic disease, and no doubt a contagious one likewise; though with respect to this, its contagious property, some difference of opinion exists even among the best authorities. The experience of most medical men is decidedly in favour of the contagiousness of ringworm, and the facility with which this affection spreads from one to another is strong evidence in support of it, as is likewise the cause of the disease, which is due to a parasitic plant termed the *Tricophyton tonsurans*.

Ringworm occurs both on the head and on other parts of the body. Wherever in fact the skin presents hairs, and of necessity, therefore, hair follicles, the disease is able to locate itself. It occurs in more or less circular patches, over which the hair is either matted in clusters by an ichorous discharge, or is broken off in irregular clumps by the action of the parasite. The skin is slightly elevated, its papillæ much enlarged; at first there is no discharge, and not unfrequently none is present throughout the course of the disease. The patches are well defined, and when itching has been present to any extent, true inflammation of the skin not unfrequently results, accompanied by its own proper discharges. Sometimes this inflammation is sufficiently severe to result in the formation of pus, which forms within pustules along the edges of the patches, around the apertures of the hair follicles. The rings sometimes assume considerable dimensions, especially on the body. Sometimes only one is present on the scalp, but it is often observed that the parasite has located itself at several parts of the scalp simultaneously. At the early period of the disease, all that can be seen is a thin scurf—more as a dust than as a layer—around a few single hairs, or a larger number constituting a patch. If

cleanliness be observed, these patches present merely a dry appearance, and eventually some baldness ensues, which is, however, never complete, as in the typical Alopecia. As the disease progresses, the skin becomes raised, the papillæ display themselves on the surface of the inflamed patches, and at length the alteration occurs in the hair. The fungus we have specified, the Tricophyton tonsurans, has its primary seat in the hair follicle, whence it spreads into the substance of the hair, and on to the surface of the cutis. Grüby asserts that the scurfy powder is the parasite by which the disease is communicated from one patient to another. On examining the powder, it is seen to be made up of an infinity of cryptogams; and if the diseased hairs be in like manner examined, we observe a great quantity of the cryptogams embracing the cylindrical portion of the hair on all sides, and forming round it a complete sheath, which envelopes the hair for some little way after its exit from the hair follicle. It is thus in the hair and follicle that the disease is located. The diameter of the diseased hair considerably exceeds that of the healthy structure. The cortical portion of the hair is not immediately concerned in the morbid process. It becomes, however, liable to split, cracking and

falling away, and so leaving a rough shaft. The central part of the hair escapes the influence of the parasite, which expends itself mainly on the fibrous portion. The external portion of this fibrous structure is found to be formed of transparent nucleated granules packed together like so many tiles, and, having but little cohesion among themselves. The internal portion becomes altered in texture; its fibres become wavy, and thicken, and display long rows of the above granular bodies. The whole structure of the hair is less transparent; the minute granular molecules separate the fibres from each other, rendering the whole shaft very friable, which at the same time becomes swollen or hypertrophied.

The vegetable parasite brings about the same granular degeneration of the epidermic lining of the hair follicle that we have formerly described. By contact with the adjoining hairs, these become involved in the same morbid process. The hairs break spontaneously at short and various distances from the skin; the ends are seen to be jagged, discoloured, and twisted. At the same time the skin is felt to be covered with rough eminences, due to the enlarged and diseased hair follicles, forced out by the hair in its growth from beneath the surface of the skin. If the disease be not now arrested,

the branny matter becomes glued together, and gives rise to dry, thick, and yellow incrustations. Whatever, then, the true relationship of the parasite to the disease may be, it is evident that whether it causes the vegetable growth—or is caused by the vegetable growth—there is present such a morbid condition both of the hairs themselves and their containing follicles, as evidences a vitiated nutrition, strictly analogous to that which is inseparable from degenerations resulting from scrofula in other textures and glands of the body. The general health of the child is always impaired. It is pale, heavy, and apathetic; cachetic, and altogether below par. The nervous supply to the vessels and follicles of the scalp is perverted, circulation is not normally carried on, and local inflammations, with their subsequent effusions, commonly arise to complicate the case.

We are in the habit consequently of directing our efforts in the treatment of this disease, firstly, to the removal of the parasite, and secondly to effecting such a restoration of nervous energy that subsequent secretion from the hair follicle may be healthy and unimpeded. The general health should always be carefully watched, and the medical attendant will mostly think it essential to administer preparations of iron and other tonics, attending at

the same time to the state of all the secretions. The disease in our opinion is contagious. We, therefore, recommend in all cases that the child be separated from its companions. The hair should at once be cut close, not only around the ring to which the disease may be supposed to be restricted, but all over the head. The parasite is most insidious, and often when the hair is taken off, many spots are discovered, which would all be the centres of fresh rings in course of time. The head should then be well and carefully washed with soap and water. Should any incrustations be present they should be tenderly removed after efficient poulticing with bread and water, or saturation with tepid water, applied as a dressing. Having, then, the disease clear before us, we treat it with some agent which effectually destroys the parasite. Some specialists are very partial to fumigations of the scalp with the vapour of cinnabar or of sulphur. The material is ignited in a convenient vessel, and the vapour conducted to the scalp through an india-rubber tube. Others apply lotions of carbonate and bicarbonate of potash, of cyanuret of mercury, of borax, and of carbonate of ammonia. But the simplest and cleanest application is the tincture of the muriate of iron. A sponge moistened in the solution is

dabbed freely over the rings, and wherever the presence of scurf around the hair indicates the presence of the vegetable.

Greasy applications are not objectionable, but they are dirty and clumsy. Nevertheless, the dilute nitrate of mercury ointment may be used subsequently to accomplish the second indication of the treatment where it is not convenient to seek special advice. In patients under our care we are in the habit of restoring the integrity of nutrition and the vitality of the part by the following lotion:—

Nitric acid,
Muriatic acid, of each . 20 drops.
Water . . . . . 8 ounces.—Mix.

And in certain other cases a lotion of sulphuret of potassium in the proportion of two ounces of the salt to a pint of water, acidulated by two drachms of sulphuric acid, may be advantageously employed.

CHAPTER XII.

ON FAVUS, OR PORRIGO FAVOSA.

THE epiphyte termed by naturalists the Achorion Schönleinii, is the cause of one of the most disgusting of the diseases to which the scalp is subject. This disease is termed Favus, or Porrigo favosa, and is characterized by crusts of a bright yellow colour, of a shape like a little cup, rising very little above the surface of the skin, and developed beneath the epidermis, and laid bare subsequently by this latter scaling off. The crusts, when distinct, are circular; but as the disease progresses they become confluent, the circular character persisting at the margin. The whole head, in severe cases, becomes covered with a yellow scab, strongly adherent, and if left to itself lasting for months or even years, becoming thick, dry, and pale, and splitting up in all directions. The crusts, however, always present their slight central depression, which has been thought to resemble the appearance of the much deeper cells of the honeycomb. The depression is due to the mode of

growth of the favus, fresh matter is deposited in successive rings around the crusts first deposited, which loses the fluid it contains by desiccation, and consequently shrinks concentrically. Each crust is seated on a slightly inflamed base, and is traversed in the centre by a single hair. The itching at times is considerable, especially if cleanliness has not been strictly observed, and under the large scabs lice are sometimes found, a disgusting state of things, not in the least mitigated by a most offensive smell.

Mr. Erasmus Wilson looks upon the matter of favus as a modification of the elements of the epiderma. He bases his opinion upon the analogy he believes can be traced between the origin and growth of favous matter, and the successive transformation of the plastic epidermic fluid into granules, aggregated granules, nucleated granules and cells, and ultimately flattened scales. That is, in simple language, in its progress from its vital to its extra-vital state. Unfortunately for his hypothesis, with which we entirely disagree, the scales of favus the wider they are the more do they evidence vitality. The growth of a disc depends on increased vitality at the circumference, whereas if the disease consisted in a modification of epidermic elements, it

would be less active at the circumference, as their more remote form the morbific starting point or centre. The favus is, in fact, a special structure, and not a modification of healthy normal structures at all, which are, at the early stages of the disease, found unaltered upon its removal. The plant fastens itself upon the skin, either in the hair follicles or in depressions of the surface. When it occurs on the surface of the skin, it forms a little cup-shaped mass, at first developed beneath the epidermis, and at length becoming bare. When in the hair follicles themselves, it is probable that the parasite had previously had another seat, for it is only the spores or germinating bodies that occur therein, adhering to the hair and forming around it a kind of sheath. The view of Mr. Wilson respecting its nature is shown to be erroneous by the experiment of Grüby, who inoculated various parts of the body with it, and even caused it to grow upon wood.

The crusts, though adherent, may with care after poulticing, be removed from the scalp without injury to the skin, slight erosions only being found if the disease has not too far advanced. In the latter case, the skin and the subjacent tissues may take on a severe and chronic inflammation, which

may extend even down to the bone. In such cases the bald shining patches that remain evidence the severity of the disease.

The crusts are made up of a peculiar vegetable formation, whose yellow colour enables us to recognize its presence around the openings of the hair follicles. We have already observed that the plant is at first developed beneath the epidermis, and at an early period it is quite evident that the hair itself is separated from the growth by the epidermal lining we formerly described as belonging to the hair follicle. The aperture of the hair follicle is, in fact, free, but it is plain that the existence of such a foreign substance must soon interfere with the functions of the follicle, and the consequent nutrition of the hair. Practically we find this always to be the case; the hair of the diseased part loosens forthwith upon the commencement of the disease, and a very slight pull is sufficient to extract it. Where the favus has been long present, the hair falls off spontaneously. The hair follicle becomes altogether destroyed by the effects of protracted inflammation, and local baldness results from necessity. Where the inflammation has not extended so far, the hair may again be secreted, but the functions of the follicle—if not destroyed—are

at least impaired, and the hair is always weak, fragile and woolly, and, its pigment being deficient, is consequently lighter.

The spores or reproductive particles of this parasite find their most favourable nidus on the scalps of sickly children. Ill-fed, ill-cared for, the vitiated constitutions of the unfortunate progeny of the lower classes render their skins unhealthy, the circulation languid, the nervous system inadequate to the maintenance of vital power. Foreign growths readily attach themselves to the surface, if, indeed, they be not engendered by the depraved secretions of the scalp glands, and hair follicles, superadded to an abundance of dirt. In the treatment of favus, indeed, all our efforts will be futile without the strictest cleanliness, and altering by such remedies as quinine, iron, and the mineral acids, the tainted and scrofulous constitution. Such a *cachexy*, as this depraved habit of body is termed, displays itself in the little patients frequently, moreover, by enlargement of the glands of the neck, so much so as to have led some authorities to consider such enlargement in strict association with the disease. When such is the case iodine should be administered under medical superintendence. As the disease is contagious: precautionary

measures should always be put in force—Exercise, Sponging, Diet, Lime-water.

The local treatment of favus has undergone important modifications of late years, and varies in present practice according to the opinion of the practitioner upon the irritating tendency of the hairs. An erroneous pathology for a long time led medical men to consider the disease as a morbid action occurring in the hair roots. Accordingly, all their efforts were directed to pulling out the hair; a remedial method as sound as that which should induce the tearing up of a tree by the roots because the vegetables in the neighbourhood were afflicted by a blight. Rayer states, "In old standing cases every method of treatment into which the avulsion or removal of the hair does not enter as an element is incomplete, and unworthy of being entitled curative." Accordingly, a plaster —which might well be styled *sticking*—was applied to the entire scalp, and by-and-by torn off deliberately. "After the lapse of three or four days, the plaster was removed rapidly the contrary way of the hair, and a second was put on, which was likewise removed, in the same manner, three or four days after its application. The plaster was subsequently renewed every second day, taking care to have the

head shaved when this measure appeared necessary. As may be conceived, and as was intended, these plasters, each time they were removed, tore out a quantity of hair more or less considerable. The first applications were attended with cruel sufferings; the agony became less and less severe as progress was made in the treatment. Nevertheless, the pain was still so great at a month's end, that children might be heard screaming dreadfully when the plaster was removed; after *the third month* the pain of the dressing became less intolerable." Children not seldom lost their lives as well as their hair.

At present a little knowledge of the nature of the disease enables us to cure without killing. We must get rid of the inflammation, the dirt, and the parasites. Having thoroughly cleansed the scalp with frequent fomentations and sponging with a solution of Potash-ley properly diluted, the incrustations must be tenderly lifted and eventually removed. A large warm poultice of linseed or bread is very efficacious in loosening the crusts, which should in no case be torn away; the process is much facilitated by applying a solution of Bicarbonate of Potash by means of a soft rag, and covering the whole with an oil-skin cap. The hair should

then be closely clipped and even shaved, wherever the skin is not abraded or too much affected by inflammation. Thorough cleanliness is at all events obtained, and the locus of the disease more efficiently acted upon. The remedies in use, when all has been done by these simple measures, vary much, according to the taste and experience of the practitioner. Some prefer ointments, of which the most in vogue are the dilute Nitrate of Mercury ointment, and the dilute Nitrico-oxide of Mercury. Wilson recommends a cerate composed of an ounce of wax, and from ten to thirty drops of Croton oil; we have a dislike to all greasy applications, and have been always successful with a lotion of—

Bichloride of mercury . 12 grains.

Mucilage of bitter almonds, 6 ounces.—Mix.

Another admirable lotion, recommended by Dr. Jenner, is that of Sulphurous Acid. A stream of sulphurous acid is passed through water until the latter is saturated. Then take of the—

Saturated solution . . . . 2 ounces.
Water . . . . . 6 do.

Nothing where the skin is not abraded is, however, more effectual than the application of the strong acetic acid of the Pharmacopœia applied by means of a sponge tied on the end of a little stick.

CHAPTER XIII.

ON SCURF, OR PITYRIASIS.

THE third scalp affection that comes under our notice is one which, like Ringworm and the Honeycomb favus, originates in a parasitic growth, and which, to a more or less degree, exists upon most scalps at one period or another during life. The technical name for the complaint is Pityriasis, the familiar name Scurf, or Dandriff. The parasite has received the name of Microsporon furfur, and is mostly associated with that variety of the affection which occurs on the general surface of the body, as Pityriasis versicolor ; but no doubt there is also an intimate connection or dependence between this parasite and the Dandriff with which at present we have to deal.

Pityriasis is usually defined to be a superficial chronic inflammation of the skin, resulting in a copious mealy shedding of the cuticle, which is incessantly renewed. We should scarcely venture to differ from received views upon the pathology of

this affection, were we not emboldened by a very extended experience with respect to it, and a vast number of observations upon Scurf in subjects of all ages where the shedding has been most abundant and the inflammation altogether absent.

The Dandriff is most common in very young or aged individuals whose scalps have either not yet acquired, or are parting with, the usual supply of hair. Some atmospheric agency might possibly be surmised as an excitant of Scurf; as though Nature were endeavouring to make up for the absence of the hair by excessive secretion of epithelium. Granting the propriety of such a view as this, there is nothing in it which sanctions our placing Pityriasis among inflammatory affections of the scalp. For inflammation is accompanied not by excessive secretion, but by defective or absent secretion. An inflamed organ does not continue to pour out secretions, it fails to secrete altogether. Moreover, the development of Dandriff is very frequently accompanied by an inactive condition of the bulbs of the hair; a state of things which points rather to a deficient circulation of the nutritional juices, and not to the stagnation which inflammation, when protracted, brings about. Were inflammation in a chronic form present—and chronic it must be

if it really is the cause of the chronic desquamation —we should have present the results of the inflammatory process, redness, heat, and swelling from the effusion of stagnant fluid.

In infants, Pityriasis displays itself in the form of minute dry and whitish scales, which, falling off, may possibly leave beneath small superficial red spots. The presence of these red spots has been held indicative of the existence of inflammation, but it has been altogether forgotten that the deeper portion of the skin, which is of course exposed where the shedding takes place, is naturally of a redder hue than the surface. But even this natural redness is only rarely met with, and its very frequent absence is demonstrative of the non-existence of inflammation. Accompanied by a slight itching, the patient scratches himself, and produces a multitude of minute scales. These are almost immediately replaced; and when these fall off, the parts beneath are mostly of a dull white appearance. If these spots be rubbed, other thin scales like the original ones may be raised, and still no inflamed surface will be arrived at. The exfoliation sometimes consists of such minute particles, that it falls off like a cloud of dust; and we have had under our care persons of different ages, in whom merely

shaking the head sufficed to produce this very curious condition.

One of the most frequent causes of this troublesome affection is a too frequent use of the small-tooth comb. Nothing better illustrates the folly of rushing into extremes than this. On the one hand, Ringworm, Plica polonica, Favus, and such affections are invited by dirt; on the other hand, that over-fastidiousness which impels the fond parent to be perpetually brushing and combing her children's heads, is alike, though not to the same extent, inimical to health. Not that inflammation is induced, nor that the shedding of the epithelium results therefrom. But so frequent a stimulation of the roots of the hairs causes an undue amount of follicular secretion to pass into the hair itself. The bulb of the hair consequently weakens, the epithelial lining of the hair follicle dries up and is cast off. We have seen the epithelium actually torn away by this excessive anxiety to keep the scalp free from imaginary impurity, and the whole surface dotted with minute bleeding points, where the teeth of the comb have combined with the bristles of the brush in wounding the superficial vessels.

Another cause of pityriasis, as frequent as that

whose origin is mechanical irritation, is gastric disturbance. It is a very common thing for officers in the army to be troubled with the dandriff while in London leading a less regular life than they are used to do; in the height of the season going from one evening party to another, exposing themselves to sudden alterations of temperature, and partaking, perhaps freely, of sub-acid wines. Under such circumstances the stomach gets out of order, the mucous membranes become dry, and the epithelium, both of these membranes and of the skin, desquamates in minute scales. The peeling off in the former situation is indeed sufficiently common, and a pityriasis of the lips may be induced in most people by smoking or imbibing too freely overnight.

In the majority of cases it is not easy to detect the invasion of this curious affection, so insidiously does it visit the scalp. The dissent we have expressed respecting its inflammatory nature finds, as we have already remarked, support in the absence during the first period of all heat, redness, or swelling. It is only when the scales fall off in abundance, or when the itching is sufficiently troublesome that the attention of the patient becomes directed to this complaint. Considered,

then, as a slight affection, it is very common for the patient to aggravate it by the means and remedies he employs for its removal. It is especially with female patients that we have had occasion frequently to observe the evils of trifling with pityriasis; evils which, indeed, manifest themselves most where the hair is naturally the most rich and abundant. At first, in such cases, the scurf displays itself in but small quantity, and scarcely interferes with the ordinary toilette. The few scales that cling to the roots of the hair are but perceptible to the lady's-maid. But a word from the abigail is more than sufficient. Swift to the rescue are enlisted the small-tooth comb with eager points, and the remorseless brush with bristles stiff and most malignant. Nor do the greases lag behind, and many-coloured lotions, sweet to the smell, but powerful for mischief. At length, by constant assiduity, the head becomes covered with scurf, and the confirmed disease set up. We have several ladies under our care at this moment who acknowledge that they would consume more than a couple of hours every day in "cleaning the head." Satisfied, at length, with the appearance the hair presented they would hasten to finish their toilette, which, however, was no sooner completed, than to

their unspeakable distress the hair would suddenly become covered as with a white flour, and the dress put on the appearance of having been well dusted by the dredger.

Another prolific cause of pityriasis is the incautious use of hair dyes by persons who, in simple faith, credit every vaunted tincture with the most beneficent virtues. Indeed, it has happened that the majority of cases of the affection that have come before us, confessed by using certain dyes, have been in such good general health as to afford no reasonable ground for suspecting the latency of any other cause. Pityriasis has come before us likewise, however, associated with severe neuralgia of the nerves of the scalp and face, as we described in the previous pages. It would be very interesting accurately to determine the amount of dependency of the skin lesion upon the nerve irritation. We believe, ourselves, this dependency to be great, and that the perversion of nutrition in the contents of the nervous threads, indicated by pain, is sufficient to induce such modifications of the phenomena of absorption in the skin, and especially its superficial layers, as display themselves in the shedding that ensues.

Pityriasis, when chronic, is not seldom followed

by another condition of far more moment even than itself. The perpetuance of that morbid state of the nervous and circulatory functions of the scalp which display themselves at first by scurf are indirectly instrumental at length in inducing baldness. The perversion of nerve influence, of necessity brings with it a disturbance in the secreting functions of the follicle. Moreover, mechanical causes act prejudicially in the same direction. The scaly particles surrounding the hair at its base oppose at last an obstacle to its growth and free egress from its receptacle. The hair becomes hard, rough, and fragile, loses its colour and tenacity, and falls off abundantly. We have been consulted in many chronic cases of Dandriff, wherein the hair for some time had been coming out, almost by handfuls, at the slightest touch of the comb. Fortunately, this is a curable variety of Alopecia, yielding to appropriate treatment if not too long neglected, but for a time, of course, gives rise to much anxiety, especially in cases where ladies who had previously prided themselves upon the abundance of their hair become unable, even with careful plastering, to find material sufficient for the most scanty *coiffure*.

The golden maxim in the treatment of this trou-

blesome complaint is to take it easy. Leave off combing, and brushing, and rubbing, and parting—at least, do it in the strictest moderation. Let the skin rest; let the hair follicles have breathing time; omit the bandolines, the cosmetics, the hair-dye. If you have any bandeaux and deceitful "follow-me-lads," that once hung temptingly on other heads, leave them off. Avoid placing restraint upon the hair; do not drag it, and curl it, and tie it up; for a time, at least, worry anything else but your own head.

These matters being attended to, we must put into operation sundry constitutional and local measures; the former of which will, in many cases, be sufficient to effect a cure. The medical attendant will doubtless think it necessary, where the digestive system is at fault, to administer the bitters and alkalies, and, should there be sluggishness in the liver, alterative doses of grey powder and taraxacum. In persons of very delicate constitutions it will be necessary, at certain periods, to be more than usually vigilant, and to give quinine and ferruginous tonics; or, again, where there is decided evidence of congestion, to apply a single leech to the neighbourhood of the scalp. But simple re-

medies in combination with a cooling regimen will often be found sufficient, with some bran baths, or gentle saline purgative.

Take—Nitrate of potash, ten grains;
Sulphate of magnesia, one drachm;
Tincture of orange-peel, one drachm;
Peppermint water, one ounce;

every morning. But local remedies will afford, in all cases, a valuable adjunct to general treatment, and in many cases indeed cannot, without risk of baldness, be dispensed with.

In slight cases of Dandriff, the following lotion will be found advantageous:

Take—Biborate of soda, one scruple;
Distilled water, six ounces;

applied by means of a soft rag to the roots of the hair night and morning; or the following:—

Take—Camphor, six drachms;
Oil of turpentine,
Alcohol, of each, four ounces.—Mix.

In some cases, benefit is frequently obtained by the use of oil of sweet almonds, applied by means of a very soft tooth-brush; but when the affection is of some standing, it will be necessary to resort to a pomade to which, when under our own inspection, we occasionally add some phosphate of soda,

with a view to act more especially upon the nervous elements of the irritated texture.

Take—Carbonate of potash, half a drachm;
Hog's lard, one ounce.—Mix.

When there is any evidence of its complication with a parasitic disease the following should be substituted:

Take—Calomel, half a drachm;
Camphor, ten grains;
Lard, half an ounce.—Mix.

The ointments are preferably used at night. In the morning a stream of tepid water should be directed upon the scalp for some little time.

CHAPTER XIV.

ECZEMA, OR HUMID TETTER.

HAVING said that the scalp, from its anatomical disposition, is peculiarly liable to inflammation, it follows as a corollary that it must of necessity be the seat of certain eruptions, which are manifestations of the several stages of the inflammatory process. Now, there are from the first stage of inflammation to the last to be witnessed many morbid phenomena, which are exponents of the several stages :—stages of effusion of serum, of stagnation of serum, of formation of pus, and of ulceration. Each of these several stages is in itself, indeed, distinct. Each has its special eruption. Where, for example, effusion of the watery portion of the blood or serum occurs, we get the *vesicular* eruption ; where matter or pus forms, as a further result of the inflammatory process, we get eruptions of small abscesses. In the former case there is constituted the disease technically termed Eczema ; in the latter we have developed, the affection termed Impetigo.

It should be borne in mind that these two diseases indicate in all cases the presence, therefore, of a certain amount of inflammation. There is always a morbid action established, but not far advanced; and, salutary perhaps, in eczema, confirmed and of a graver tendency in impetigo. Both are characterized by their moisture, and both by the little permanency of their consequences.

Eczema, or the *humid tetter*, is a non-contagious disease, the result of an inflammation, characterized by an eruption of small acuminated vesicles or bladders, which are formed by the extravasation of the serum of the blood, and the consequent bulging of the epidermis. These vesicles, as the disease progresses, run together, and are dispersed over irregular surfaces. The fluid they contain is clear-coloured. The surface is either inflamed or unaltered in appearance. It affects individuals of all ages, and is common from many causes, whether heat, or irritating substances, or dentition. The vesicles in one case rupture, discharge their fluid contents, secreted either in astonishing quantity, or concreting in the form of small white adherent scales, permitting but of little further secretion.

The scalp, therefore, is sometimes the seat of one variety of eczema, and sometimes of another. The eczema may, in fact, be either humid or squamous.

Humid eczema commences by superficial redness of the skin, forthwith followed by an eruption of pimples, which, giving rise to itching and irritation, are for the most part rubbed, and being inflamed, become more or less decidedly vesicular. The bladders either mature and break of themselves, or are ruptured by the rubbing. The secretion from them acts as an irritant on the adjacent skin, whose nutrition, more or less vitiated in the first instance, rapidly becomes impaired under the stimulus of the unhealthy discharge. The eruption and the discharge consequently go on extending; the latter becomes ichorous and profuse. The hair becomes even soaked with the effusion; exhales a nauseous, sickly odour. Here and there the secretion concretes into scales. The inflamed patches run one into the other. The itching becomes changed to a burning heat, accompanied by actual pain. Should this condition be neglected, the simple humid eczema is converted into the severer form of Eczema impetiginodes. The scales become thicker, soft, and yellowish, incompletely hiding inflamed, tense, and swollen portions of the scalp. The hairs, under

such circumstances, eventually begin to suffer: they lose their brilliancy and their natural tint, and may even fall off; eventually, however, returning on the subsidence of the inflammation.

Among neglected cases occurring in the hospitals, and among the poorer classes, this form of eczema, which, in itself, as we may fairly suppose, has a salutary tendency, not unfrequently becomes altogether chronic. The functions of the skin are perverted, almost destroyed; the scalp is seen to be covered with a cup of incrustations of some little thickness, broken up into divisions, from which exude a nauseous yellow secretion. The primitive and distinctive characters of the simple disease can, however, in such cases always be recognized in parts of the scalp and neck, adjacent to the seat of the long standing eczema. Of course, if the disease is fostered by systematic uncleanliness, it is not impossible for the secretions of the hair follicles to become so modified that healthy hair growth, and, indeed, hair growth at all, is out of the question.

The squamous eczema proper is a variety of the disease of less frequent occurrence. Herein the secretion for the most part dries up into scales of a thin, whitish appearance, which cling around small groups of hairs in the form of a case, which seems

to grow along with the hair. The scalp is, consequently covered by these small hairy bundles, which become glued together. The adhesive material putting on very much the appearance of mortar.

Eczema is, in the vast majority of cases, present simultaneously on other parts of the body. The face and ears are not unfrequently swollen, and covered with scabs of a truly frightful appearance. The patient, if a child, may actually sink from the excessive exhaustion, brought about by the pain which it suffers and the ceaseless discharge. The disease is mostly indicative of a deranged state of the constitution, and in our own practice we have seen it supervene after fevers and eruptive diseases, exposure of the head to the sun's rays, fright, and deleterious applications in the shape of unguents and cosmetics. But the most frequent cause is intestinal disturbance, and, under such a condition, it is not unfrequent to find the mucous tract partaking in the disturbance affecting the entire system, and for an excessive diarrhœa to add to the torments of the sufferer.

In treating this affection it should be always borne in mind that its nature is essentially inflammatory, and that in simple cases it may be readily

aggravated by other than soothing remedies. The first indication is to remove, if possible, the cause of the affection, and to obviate the extreme discomfort it entails. For the former object it will be necessary, in a child, to administer—

Calomel, one grain;
White sugar, two grains;

every other morning; and to give it, if Diarrhœa or other symptoms of intestinal disturbance are present—

Lime water, one drachm;
Infusion of krameria, one drachm,

every three hours, perhaps, for a couple of days. The diet at the same time should be changed; cod liver oil, beef-tea, and small quantities of wine will prove of the greatest service, and the strictest cleanliness should be observed. A lotion of—

Liquor of diacetate of lead, half a drachm;
Extract of belladonna, two drachms;
Water, six ounces;

will be of much advantage.

Should the disease not yield to this treatment, a short course of arsenic may be ventured upon, and an ointment of bismuth, in the proportion of

Nitrate of bismuth, five grains;
Purified lard, thirty grains.—Mix.

Perhaps the application on which most dependence is to be placed is the Benzoated Zinc ointment—

Gum benzoin, in powder, half a drachm;

Prepared lard, three ounces.

By means of a gentle heat, keep dissolved in a closed vessel for twenty-four hours, then strain and add—

Oxide of zinc, four drachms.

The whole to be well mixed and strained through linen. For use take of

This ointment, one ounce;

Spirits of camphor, half a drachm;

Glycerine, one drachm;

and rub them well together.

The ointment should be applied freely, both night and morning, and a small cap, which may be allowed to become saturated with the grease, should be worn. By its application, which should be in the direction of the hair, the irritated skin is soothed; the inflamed surface is protected from the atmosphere, and crusts cease to form; and where the crusts are formed they become softened under the influence of the ointment, and can then be readily removed. The scalp should be touched with nothing else but a soft napkin, and great care should

be used in the employment even of the softest brush. It is but seldom necessary to cut the hair in this disease. Where the inflammation advances to the purulent state such may become advisable, but it can in no case be requisite to shave the hair off altogether.

CHAPTER XV.

IMPETIGO, OR RUNNING TETTER.

THE inflammatory process may, however, as we have previously stated, advance a stage further, and be attended by the formation of pus—a yellow glairy fluid, which, contained within a distended portion of the inflamed skin, constitutes what is termed a pustule. IMPETIGO, or the *running tetter*, is a scalp affection of this nature, and, indeed, the inflammatory process may even advance so far as to bring about actual ulceration of the cutis, which displays itself by the bleeding surfaces which appear on removing the crusts that are attendant upon it.

Impetigo, though non-contagious, is yet a severe inflammation of the skin. In its simplest form, constituting what is termed the *crusta lactea*, it consists of minute pustules, slightly flattened, and commonly grouped together in clusters. These pustules, by-and-by, are covered with thin crusts. This mild form of the disease affects even infants at the breast, but it is seldom that the disease restricts

itself within these limits. Commonly, Impetigo develops itself in two different forms, corresponding pretty accurately with the main varieties of Eczema.

When attacking young children, Impetigo displays itself upon the scalp and forehead, the temples and cheeks, in the form of projecting little pustules situated on an inflamed base, which give rise to considerable smarting and itching. The fluid which comes from them when their envelope has been ruptured, or has been torn by the nail, is thick, and more or less allied to pus, and concretes into yellow scabs, having the appearance of dried honey. Where the secretion is copious the crusts may form a complete cap, which can be moved upon the scalp. A bleeding surface is, moreover, often displayed on detaching this crust with the point of the finger. The eruption is frequently accompanied by enlargement of the lymphatic glands of the back of the head and of the neck, and is remarkably offensive and sickening. The top of the head is the part mostly affected; and the favourable tendency of the disease is to pass from copious to scanty secretion, from thick to thin crusts, thence to a mealy desquamation, and ultimately to recovery.

The crusts of the second or *granular* Impetigo resemble dirty bits of mortar more than anything else. The matter that escapes from the pustules is of a thicker consistence, and concretes with greater rapidity. But the pustules present for the most part the same features, being psydraceous and acuminated. This variety of the disease is strictly limited to the hairy scalp only, displaying itself upon the forehead in very exceptional cases.

The formation of the crusts is, we think, understood by the reader, but there are a few points with reference to this subject that have peculiar interest. We must be careful not to mistake the soft, thick, and yellow crusts of the first form of Impetigo, with the crusts (likewise soft, it is true, but flattened, thin and greenish), of Porrigo larvalis, or with the scales of Eczema. The effused and more or less purulent fluid of Impetigo glues the hair together, and dries up with great rapidity. In the granulated variety the crusts are at first darkish, and resemble dried honey; and may present themselves as plates formed by the agglomeration of several pustular points, and by the glueing together of a large number of hairs. But after a time they appear, as it were, sprinkled throughout the hair in the form of isolated granulations, which in-

dicate their primitive formation from so many pustular centres. As each pustule is traversed by a hair, it follows that, as the hair grows, it drags the crust along with it until, leaving the scalp altogether, it appears like a piece of mortar fastened to the hair. Of course, the older they get and, consequently, the further they are from the scalp, the harder the crusts become, until at length they have exactly the friability of hard mortar.

Impetigo is very seldom followed by baldness, and in very rare cases indeed by a loss of hair, which is in itself irreparable. The hair bulbs may, however, become partially atrophied by the frequent occlusion of the follicle by successively deposited crusts. The disease is not actually of long duration, nor is it contagious, but the abominably filthy habits of the poor not unfrequently serve to perpetuate the disease for years, and to breed a thriving colony of lice in the safe retreats the crusts readily afford.

Authorities differ as to the treatment of this affection, some recommending greasy applications, and others reprehending them strongly. But in such a disease,—as, indeed, in all others,—the best guide to successful treatment is the attending to general principles. In accordance with these it

will be necessary to attend to the constitutional condition of the patient, and to aim not merely at the suppression of purulent secretion, but at the modifying those conditions, of which the discharge is indeed merely the exponent. It will seldom be injudicious to administer cod liver oil in combination with a few drops of tincture of iodine.* Nourishing food, pure air, and cleanliness are powerful indeed, almost indispensable adjuvants. It is, however, unwise, and, indeed, mostly impossible, to dispense with local treatment. During the inflammatory stage it will be proper to apply bread and water poultices to soften and promote the removal of the crusts, and then to use freely the Benzoated Zinc ointment, recommended for Eczema. Should lotions, however, be preferred, the following may be employed :—

Bicarbonate of Soda ... ... one drachm,
Water ... ... one pint;

or, which is very effective, a lotion of equal parts of Lime Water and Olive Oil.

* The hyposulphite of soda may be given in 10 grain doses.

CHAPTER XVI.

PSORIASIS.

THE scalp is liable to become the seat of a peculiar disease of an inflammatory nature and chronic in duration, termed Psoriasis. The affection is characterized by patches of various sizes, elevated, though but slightly, above the surface of the scalp, and covered with dry scales of different thickness. Sometimes the patches are small and distinct, and at others of larger size and irregular form, marked with cracks and fissures, through which a bleeding skin can be perceived; an exalted state of the inflamed condition of the surface on which the scales rest. It is seldom that this scaly affection limits itself exclusively to the scalp, its usual seat being the general surface of the body.

Some difficulty attends upon the recognition of the early stage of Psoriasis capitis. There are few premonitory symptoms, and the disease is already, for the most part, established when attention is first drawn to it. The commencement, however, is in the form of small pimply elevations, which have a

tendency to coalesce, and subsequently to become covered with the very characteristic white scales. These are torn off in scratching, with more or less facility, and some heat of the scalp is then experienced. Where the scales are of unusual thickness the itching is more than otherwise severe, so much so, indeed, as to give the sufferer no reprieve. But the hairs suffer very little. When the eruption is confluent the hairs may, perhaps, break or get torn out, but in its orbicular form the hair is neither less abundant nor supple than in health, nor does it lose its colour or its brilliancy. In certain rare cases local baldness does, it is true, ensue, but it is always remediable and transitory.

Some questions of considerable physiological interest have been mooted with regard to Psoriasis and Lepra, the limited variety of the disease which springs from the well ascertained hereditary nature. It but seldom affects children, more frequently youth, but most frequently male and female adults indiscriminately; and it would seem that the manifestation of the disease at these latter periods of life, occurs in obedience to that complete evolution of the law of development, to which we shall draw attention in our chapter on Alopecia. Certain it is that in most cases that now come before us, psoriasis

or lepra was to be traced to the parent, though passing over one generation in some instances.

Psoriasis capitis is pre-eminently, from this and other points of view, a local manifestation of a constitutional infection, and its treatment should in all cases be directed by the medical practitioner. We are loth to recommend in these pages the employment of remedies, from whose incautious use serious consequences might accrue. But the merits of Arsenic in this affection are now sufficiently recognized by the public at large to relieve us from the responsibility of making the knowledge general. The best form for an adult is the preparation called Fowler's Solution, of which a dose not exceeding five drops may be taken by an adult three times a day after food, in infusion of gentian or calumba.

CHAPTER XVII.

ON BALDNESS.

SCARCELY does any subject present itself to the practical dermatologist so little surrounded with theoretical difficulties, and yet so little amenable to received methods of treatment, as Alopecia, whether circumscribed or general, derived or congenital. The difficulties attendant on a thorough understanding of the disease are few; for there is scarcely any scope for the imagination in deducing the causes that lead to the affection. The obstacles in the way of restoring the hair are great, inasmuch as in this affection we have to attempt the restoration of a function in an organ which, not unfrequently, is not only impaired in vitality, but has actually ceased to exist.

Let us explain ourselves more thoroughly, and endeavour to place before our readers, in a clear light, both those facts on which our own researches have been based, and the principles which have guided us in treatment.

By the term Alopecia we imply Baldness. Foxes are much subject to fallings of the hair, and in this particular we resemble foxes. Perhaps these animals in part derive their reputation for wisdom from these cranial losses, if we may judge from the prestige for wisdom which attaches itself to their human rivals when subject to the same denudation. However this may be, baldness is a loss of the hair most commonly affecting the scalp, not unfrequently the face, and rarely the other parts of the body. But, though, whether varying in seat, and, as we shall see, in extent, baldness nearly always presents the same appearance, it depends on very different anatomical and physiological conditions.

We have found the hair to spring from a bulb, which itself is secreted by a follicle. This follicle itself we have seen to be produced by an involution of the basement membrane whose vitality, and consequently the function of which, are maintained by the vessels ramifying in the derma below. It is easy, then, to perceive that loss of hair may have its primary seat either in deficient secretion from the basement membrane; diseased secretion from the basement membrane; destruction of the basement membrane; atrophy of the hair follicle; changes of

structure of the hair bulbs; obliteration of the hair bulbs; or, finally, cessation of growth beyond the bulb.

The popular notion, therefore, that hair lost can scarcely be replaced, and that when hair comes out *by the roots* it certainly cannot be replaced, is as surely erroneous; and the folly of resorting to empirics for the restoration of the hair, whose treatment, in nearly all cases, is comprised in the one word *stimulation*, needs no further proof than the above anatomical considerations supply. On the other hand, a little such knowledge must go far to protect those of the public who, suffering from baldness dependent on obliteration of the follicle itself, are spendthrifts both of their money and time in the vain endeavour to bring about what neither art or science can achieve.

The most common form of baldness is that which, occurring in a vast number of cases in men and women at about the age of 50, and in by far the large majority in men, receives the name of Senile Baldness. Here the baldness originates in an actual alteration of the hair bulbs, especially in those at the vertex of the head. For a time the individual consoles himself with the idea that the loss is but temporary and limited. He persuades

himself it has something to do with the parting, and, hopefully shifting this a little to one side, he parts for a time more in sorrow than in anger. In a little while, however, the hair falls off towards the front; and when the altitude to which the forehead attains gets to exceed those limits to which his admirers suppose his intellect has laid claim, he proceeds to the expedient of plastering over the barren surface some still luxuriant locks from the temporal region. Vain compromise! The hairs that have so long stood by him fall off one by one, and curl by curl, until, finally, his formerly well-garnished cranium emulates the billiard-ball in its absolute freedom from encumbrance.

This alteration in structure of the bulb we have, in our experience, found to present one marked symptomatic distinction from the alteration of the bulb that occurs in the congenital variety of the affection. The skin, in the former case, loses its natural appearance, and becomes perfectly smooth, of a subdued parchment colour, and is remarkably shining. The subcutaneous fat, the cushion we have before described, disappears by absorption, and the tubules of the nerves imbedded within it diminish in calibre through similar atrophic change. When we consider how large a share is taken by

fat in the composition of nerve material, it need not excite surprise that this texture should not be exempt from those absorptive processes which cause the disappearance of fat more particularly enclosed in cell wall. Nor has this disappearance of the fat and the associated nerve fibrils a merely hypothetical connection with senile baldness. The bulb atrophies where the fat disappears, but we observe that the bulbs remain intact where the fat remains, and even in the most extensive forms of this variety of baldness a fringe of hair is nearly invariably found to persist at the back part of the neck.

This disappearance of fat from the cranial vault is, in fact, but one of those climacteric changes to which the human body is subject on attaining its full maturity, and it is in the physiological appreciation of this law of growth and decay that all our hopes of remedying senile baldness must be placed. The extent of interdependence of fat and nerve tissue has not yet been fully determined. We believe it to be much more intimate than has hitherto been supposed, and having long held this opinion we are accustomed, in practice, to consider the disappearance of this fat to indicate a proportionate diminution of nerve supply to the hair follicle, and imperatively to call for those remedial

measures, which, signally successful in our hands, have for their object the regeneration of this important principle, by which alone the nutrition of the bulb can be preserved.

The immediate cause of the baldness, then, being an atrophic alteration of the hair bulb, its essential and primary cause is failure of nervous supply. Nor will this view, novel though it is, be other than fortified by reflecting on the various conditions of the nervous system, which are acknowledged beyond dispute to precede and directly to induce senile alopecia, as cause anticipates effect.

The various emotions to which the mind is subject act so frequently as directly exciting causes for baldness, that even the non-professional eye readily associates them together. Under the protracted and wearing exercise of thought the nervous supply to the hair follicles is cut off; the vessels receiving their nerve filaments from such enervated sources either become dilated or unnaturally contracted. In the former case stagnation of blood occurs at the bulb; in the latter, blood fails to reach the bulb in quantity sufficient for nutritive purposes. In both cases the temperature of the scalp is no longer maintained at that standard favourable to growth, and the altered

qualities of the blood, and the rate of its distribution are equally powerful agents in inducing the the losses in question. Similarly productive of the above train of phenomena are want of sleep, grief, and excessive anger. We all know that under the influence of irate feelings individuals not unfrequently attempt to tear out their hair in handfuls. To such it may not be unadvisable to point out the fact that, it is not unlikely, that some day Nature may save them the trouble.

CHAPTER XVIII.

BALDNESS, CONTINUED.

From what has preceded it can readily be understood that causes inducing inflammation at general or circumscribed spots on the scalp will act as causes of alopecia. *A priori*, therefore, we might anticipate that certain forms of baldness are producible by eczema, impetigo and herpes, and by the various species of favus. Such indeed are frequently met with in practice. Inflammation is present in the cuticle, and not unfrequently the deeper layers of the skin; the products of inflammation are thrown out into the hair follicles, the hair follicles themselves inflame and suppurate, the hair is loosened, and eventually falls away. But in these circumscribed forms of the affection a very important practical distinction may be drawn between them and the senile baldness: viz., the hair follicle does not atrophy. With the cessation, therefore, of the inflammatory process these perversions of nutrition disappear in like manner; the blood resumes its natural properties, the nervous supply is

no longer in excess or cut off, and relieved both from pressure and other inimical influences, the follicle eventually secretes the hair bulb anew.

Of such nature are the local baldnesses that ensue on the inflammations accompanying pityriasis, psoriasis, and lepra; upon diseases attended by the formation of scales and upon acne and vitiligo; and in all such cases where inflammation has been present, either as an essential or as a secondary phenomenon, we are inclined to locate the evil in a faulty condition of the circulation sequential to nervous lesion.

But alopecia is by no means restricted to old people, nor to such as are in the habit of expending, either in intellectual or degenerate pursuits, a large amount of nerve force; or, again, to such cases as we have just specified, where inflammations proper, vitiate the conditions of being and of growth. Alopecia is by no means an uncommon sequel of acute and exhausting disease, wherein the blood, being contaminated by what the Registrar-General denominates a zymotic poison, the secretions for a time are depraved, the organ subservient to them being at the same time damaged in the endeavour to throw them off. The hair we have itself found to be a secretion: we, therefore,

must not be surprised to find that after the system has been subject to attacks of fever, scarlatina, measles, and small-pox, the hair not only is imperfect, but in some cases is altogether suppressed. The progress of such cases affords the strongest evidence of the intimate and inseparable dependence of the hair upon the force supplied to the nerves. At the onset, the hair, in common with the skin, the kidneys, the bowels, the liver, endeavours to assist in the depuration of the impure blood. Sometimes it, to a certain extent, succeeds in the attempt: the scalp, irritated by the unnatural secretion, becomes dry and scaly; the hair is charged with excrementitious matter; it exhales a peculiar odour; it is damp, or preternaturally dry; it is brittle, and loses its peculiar lustre and elasticity. Ultimately, growth is impossible under the circumstances; excretion is required in excess, the foreign material is no longer removed, it accumulates in excessive quantity around the bulb, and at last the blood at the spot contains the elements of nutrition, in a proportion to the morbid matters, altogether inadequate to the maintenance of vitality.

No stronger instance can be adduced of the dependence of the hair, as a secretion, upon the

integrity of the nervous supply mediately through the blood, than the influence exerted both upon its quantity and quality by the poison of syphilis. Syphilitic alopecia is by no means of uncommon occurrence in the practice of medical men; nor is there any disease that so readily tests the diagnostic acumen and skill in therapeutics of the practitioner. For, unlike senile alopecia, or the circumscribed forms of baldness we have mentioned as resulting from local inflammations attendant on other diseases, this variety is rarely diffused over the scalp, but manifests itself in a thinning of the hair, commencing mostly on the crown of the head. Thence it may extend to the other parts of the scalp. The hair often assumes an unnatural hue, and a peculiar dampness and lank appearance; and around the roots may very frequently been seen specific spots of inflammation, the colour of which may, in not seldom instances, alone serve to discriminate the disease. The hair falls off very readily when brushed with a hard brush or under the use of the small-tooth comb; but if proper medical treatment be instituted, its restoration may fairly be expected. This alopecia is wont to attack the eyelids, eyelashes, and beard; nor need the non-limitation of it to the scalp excite surprise, seeing that the

disease is essentially of constitutional chararacter. It is, in fact, one of the secondary symptoms of this most insidious and terrible affection, and usually is later in displaying itself than other affections, which acting upon other organs, such as the bones and the throat, not so essential to appearance, excite less apprehension in the sufferer's mind. It, is sometimes, by no means an easy task to discriminate between these forms of alopecia. For senile baldness, may, on the one hand, attack young people, and syphilitic alopecia is, on the other hand, not always escaped by those of maturer years. As a general rule, however, as we have said, the hair becomes thinned in the latter case, and altogether disappears in the former; but it should be borne in mind, that such thinning is by no means evidence of a specific constitutional taint, inasmuch as we have seen that acute diseases, to which the most innocent are subject, tend to impair the nutrition of the hair bulbs, and the secretion of the bulb itself. In cases of obscurity, we are in the habit of first obtaining the opinion of a medical expert; for, without constitutional treatment, local measures must, at best, be but palliative. Such treatment should, in all cases, be entered upon at the earliest possible period, for it is a general law, that when once an

organ fails in its secretion, its functional powers remain to a certain extent impaired during the remainder of life; the secretion is but seldom re-established in its complete integrity, and such return to the healthy state becomes the more unlikely, just in such proportion as the vitiated condition has become habitual and confirmed.

If the diagnosis, however, is sometimes difficult between senile and syphilitic alopecia, and between this latter and the several varieties of induced baldness, it is still more uncertain when there is evidence of hereditary transmission of the affection. CONGENITAL alopecia, the other variety we would here allude to, simulates very markedly the senile variety; and, as though to make the diagnosis more difficult, is occasionally co-existent with the above constitutional infection. It hence follows that the two conjoined may be transmitted from the parent, and this simultaneous transmission from the parent to the offspring of two distinct diseases, subjectively identical, is one of extreme interest and presents no little difficulty.

Congenital alopecia, as occurring in our own practice, presents two separable and distinct varieties. These we specify more particularly, inasmuch

as the affection itself, being a rare one, any additional light thrown upon the subject cannot fail to be of advantage; and we ourselves, and that within the last few months, have had more cases of this affection come before us than, we venture to say, have presented themselves to any London specialist, however distinguished, for many years together. The varieties, we would insist upon, are characterized by the periods of their invasion. The first class of cases are bald at birth, or so nearly bald that it may be considered that the hair-follicle is in the simplest rudimentary state. The second class of cases are born with the usual quantum of hair; to a certain age the hair grows, and is, it may be, actually luxuriant, but soon after, the hair begins to fall. First, the hair of the scalp comes off; next the eyebrows and eyelids; then the hair from the armpits, and, finally, the hair from the chest and pubis. Eventually not a single hair remains to be seen on any one part of the body. In the first class of cases there is, we believe, an absence of hair follicle altogether, or, at all events, so imperfect a development of the secreting apparatus, that treatment can scarcely promise any amelioration. The latter class of cases is replete with a higher and,

so to speak, a transcendental interest—an insight into which affords one main hope of providing a remedy.

There are certain constitutional diseases, the results of morbid states of the system, which acquired from the parent, manifest themselves in nowise during infancy and youth, but advance with certain though slow degrees until, the period of maturity being attained, they display themselves, as it were, suddenly and in an acute form. These diseases or cachexies lie hidden for a time, even to the most observant eye, and to the individual himself. That the germs of them are, nevertheless, in the system, is evident by the fact that they follow, and are the results of, certain morbid conditions, originating in the parent, and visit such only as trace their descent from a contaminated source. They mature, and, in the lapse of time, take on certain features, which may be predicated of them at their onset, and have a physiognomy as referrible to the parent as the character of the features. Such a disease is gout; another is consumption; a third is cancer; a fourth is congenital alopecia. The parent, we will say, is gouty or consumptive. For many years of the child's life no symptoms of gout or consumption can be discerned. The child thrives, and the most

sanguine hopes are entertained of the freedom of the progeny from the constitutional taint. But just in like manner as the resemblance to the parent, at first imperceptible, becomes subsequently apparent, and the youthful and inexpressive face by degrees assumes the proportions and salient characteristics of its parent, so does the latent disease eventually present itself in unmistakeable form, and the inherited vice take on its peculiar features. The youth is troubled with obscure pains; or the hacking cough begins to distress; and, eventually, the full-grown child presents the gout or consumption in the same unmistakeable form as that to which the parent fell a victim.

Of such a nature is the second variety of congenital alopecia. It developes in obedience to a law of morbid growth, and at a certain period of this growth, in obedience to the idiosyncrasy of the individual, or the special qualities of the vice. Thus some cases of congenital alopecia have displayed themselves to us only at the age of twelve years, others at the age of sixteen, others at twenty-five, and one very remarkable case at the age of thirty-two.

We think we perceive, in the contemplation of these facts, strong corroborative evidence, if it were

needed, of the soundness of our views as to the nervous origin and seat of the affection. Congenital alopecia may, we believe, be looked upon as indicative of a faulty development of nerve functions, as consumption indicates a faulty development of the functions of assimilation. The former are sufficient, to a certain extent, for a certain time. In the latter we see the nervous functions intensified, and indeed preternaturally vivid, but the assimilating functions soon decay. One part of the system is in advance of the other, in accordance with a developmental law of parental type. When its acme is attained, it fails to contribute its share to the general resistance to decay, and baldness and tubercles display themselves in consequence.

CHAPTER XIX.

HYGIENE OF THE HAIR.

THE advantages of the perhaps elaborate details that we have hitherto supplied is the deducing from them certain general principles, which, by being borne in mind, enable us to obviate the tendency to disease of the scalp and to premature loss of its covering, and to instruct us, in short, in the management of the hair. This portion of our subject therefore resolves itself very naturally into the management of the hair both in health and in disease. It is the management of the hair in health that it is our business here more immediately to discuss. The management of the hair in disease has been already dwelt upon to some extent in the discussion of the several scalp diseases, and to the details thus furnished we shall have but little to add.

It would seem at first sight the simplest thing in the world to keep the hair in a healthy state, nor is it absolutely indispensable that for this purpose that either the anatomy or the physiology of

the hair should be minutely studied. And yet what can be more common than to see individuals either altogether oblivious of their heads and leaving the scalp to shift altogether upon its own resources? The hair of one man will present a moppy disentangled mass altogether impenetrable by the small-tooth comb; the secretions of the scalp remaining unremoved acting as local irritants and niduses for foreign bodies, the even growth of the hair being altogether perverted by the restraint upon the hair shaft this entanglement brings with it, the bulbs of the hair becoming swollen and inflamed by the detainment within them of the juices that would otherwise circulate throughout the hair. Other persons, again, who might consider themselves libelled if accused of neglect of their hair, render their laudable efforts of combing and brushing almost valueless by wrapping up the head in caps during the day, and *bonnets de nuit* or handkerchiefs at night. The hair and scalp are never ventilated. The insensible perspiration is not removed by evaporation. Headaches and derangement of the nervous and circulatory processes ensue, with not unfrequently decay of the hair-roots and losses of the hair. On the other hand, there are another set of persons, who, as we have formerly had occasion to remark, are never

at rest with regard to their scalps. The tweezers, the small-tooth comb, the brush, depilatories, pomades, oils, and powders, are in ceaseless requisition, to the inevitable alteration of all those conditions which alone preserve the hair, and the remembrance of which is all that nature requires. Fancy and fashion alike combine to thwart the growth, despoil it of its flexibility, and banish its resilience. Some ladies we have seen to tie up their hair, thrown back *à la Chinoise*, in such inflexible bonds, that altogether unable to frown, they were nearly incapable of winking; a loss of power which, advantageous as it may be to the perfection of deportment, is scarcely to be commended on grounds strictly physiological.

But of all the inscrutable follies with which the present age is chargeable, surely none can surpass that which centres in the so-called electric brushes. As though the bristles of the stiffest brush were not sufficient in themselves, one must needs resort to bristles of metal, constituting a complete curry-comb, to which, to say nothing of the human scalp, the hardest hide is pervious. Conceive the delicate hair-sheath under the lancinating influence of the metallic or so-called electric brush, and imagine the shattered condition of the hair-bulbs in their mangled and bleeding receptacles!

Were we to include in one word all that should be said on the management of the healthy hair, that word would be Cleanliness. But perfect cleanliness is the result of certain familiar processes, cutting, washing, combing and brushing, each of which, especially the first and last, may be imperfectly done, over done, and badly done. We shall have to say a few words on each of these topics.

CHAPTER XX.

CUTTING THE HAIR.

REMOVING the only clothing with which nature has furnished man was doubtless, at first, a matter of convenience, and probably the locks which, by falling over the forehead, impeded the view, were the first lopped off: but in process of time fashion effected many a fantastic change, until she finally reduced man's hair to the *regulation* cut of the present day. Women still retain a larger portion of Nature's gift, but under restrictions.

Cutting the hair, as it is generally understood, is certainly a mere question of convenience or fashion. Fortunately for hair-cutters, fashion is very *exigeant* on this point, for nothing sooner strikes the critical eye than overgrown hair; or, worse still, the appearance of a head bearing evident marks of having been recently cropped. Beau Brummel said, if a man were really well-dressed, no one would turn to look after him. So in hair-cutting. The intervals

between the recurrence of the operation and the quantity removed should be so nicely balanced, that a gentleman's hair ought *never to have the appearance of being just cut.* Although there may be a little difficulty now-a-days in telling a gentleman by his dress, yet the cut of the hair stamps him unmistakeably. A nobleman whom we have attended for many years insists that he can tell at a glance Poole's cut in cloth and Truefitt's in hair. Nor can this be accepted other than in the light of praise legitimately earned, inasmuch as a blunder in hair-cutting is both unpardonable and fatal to the victim's style. In cutting the hair we do not hesitate to say that, except in the first houses, no regard is paid to the requirements of the individual, but all is done upon a fixed and mechanical method—a method which, moreover, is found by personal experience to vary with the assistant under whose hands you may happen to be suspended.

A man has but to deprive himself at any moment of the hair upon his face to render himself forthwith uncertain of his own identity. It is not very difficult to concede, therefore, how much the appearance of the individual is deteriorated by an unskilful use of the scissors. Crop a man and you transform him instantly into a creature. The infant prodigy

of an admiring circle and the beautiful pet of the fondest of mothers, no sooner loses his curls than the chains which riveted him are loosened, and off he is packed to school. Women but seldom have much of their hair cut off: when they do it is generally under compulsion, previous to entering upon a course of oakum-picking; and so truly does their instinct rebel at the monstrous proceeding, that they resent the interference occasionally in the most unreasonable manner.

"The first inexorable rule on being admitted into Millbank," says "A Prison Matron," "to which the new prisoner has to submit, and which is a trial that is always the hardest to bear, is that of having the hair cut. With a woman new to the rules, a comer who has not sat in that room before, with the scissors of Atropos snipping around her head, this operation is seldom performed without a remonstrance. Women whose hearts have not quailed, perhaps, at the murder of their infants, or the poisoning of their husbands, clasp their hands in horror at this sacrifice of their natural adornment —weep, beg, pray, occasionally assume a defiant attitude, resist to the last, and are finally overcome only by force. It is one of the most painful tasks of the prison, this hair-cutting operation—moreover,

it is, in my own opinion at least, a test of character.

"One woman will be resigned to her fate on the instant, and, with a Socratic stoicism will compress her lips, submit herself to the shears, and march away to her bath afterwards in a business-like manner. A second will have a shivering fit over it; a third will weep passionately; and a fourth will pray to be spared the indignity, and implore the matron on her knees to go to the lady superintendent and state her case for her.

"Some women are impressed with the idea that coaxing will go a long way towards softening the matron's heart, or at least obtain some relaxation of the rule, and permission to retain a greater length of hair on their heads; and consequently bestow many 'my dear's' and 'God bless you's!' on the operator.

"The greatest trouble in my experience of prison life was with an old woman of sixty years of age, and with about the same number of grey hairs on her head. She was an old prison-bird, had spent two-thirds of her life in confinement, and was as vain of her personal appearance as any girl of seventeen.

"'No, Miss B.,' she said to the operator, after

catching signs of the scissors, and drawing herself up with the haughtiness of a duchess, 'not this time, if you please, Miss B. It can't be done.'

"But Miss B. replied it could be done, and was absolutely necessary to be done before the prisoner left the room.

"'Things have altered a little Miss B., since I saw you last, I can assure you. You've no power to touch a hair of my head, mum.'

"'How's that?'

"'If you please, mum, I'm married!' and the old woman regarded the matron with undisguised triumph.

"'And what's that to do with it?—sit down—you really must sit down.'

"'What's that to do with it?' shrieked the old woman indignantly; 'why, it's my husband's hair now, and you daren't touch it, according to law. It belongs to my husband, not to me, and you've no right to touch it. Lord bless you, the Queen of England daren't lay a finger on it now!'"

The general style of cutting must always be, to some extent, controlled by fashion. We could, however, urge the importance of shunning one excess into which a fashion in vogue, more particularly abroad, has led most English *coiffeurs*—

this is what is termed thinning the hair. Ten chances to one if one puts one's head under the scissors of a stranger this is what happens. Whether your hair be thick or thin, stubborn or flexible, long or short, up goes, in a vertical direction, a doomed mesh. Then the doomed mesh being held in a stretched and slanting manner, the blades of the scissors are not made to close upon it and have done with it, but they are gingerly approximated so as to scratch the aforesaid doomed one. The result of the scratching is the leaving the doomed one to find itself made up of a disconsolate, ragged, and uneven bundle of ill-assorted hairs; and, when the whole of the hair has been similarly treated, the result is curious and ingenious enough. No two hairs are of the same length; each hair is cut obliquely at the free end, and growth, of necessity, is rendered uneven, if not actually perverted. The consequence is that every hair, as soon as it does begin to grow, turns up derisively, and will not be calmed down. Eventually one must be thoroughly cropped to give the head another chance, or a plentiful stock of grease must be plastered over to hide the evil doings of the malefactor.

Very careful cutting is required in many of those

affections previously described, especially in such of them as not unfrequently are associated with enlarged hair-bulbs, whose circulation is carried on through dilated blood-vessels. In the case of a young lady of thirteen, of great nervous susceptibility, we were compelled to resort to partial cutting at each visit, and this not only to save the child the actual pain that cutting the hair gave rise to, but to obviate the extreme depression that was certain to follow upon the copious secretion that poured forth from the freshly-cut extremities of the hair.

To use a happy simile of Mr. Erasmus Wilson, —"The treatment here required is that which a gardener would give to his roses; here one of weak growth must be cut short off near the surface, that its stem may receive more sap and the plant may grow up stronger and thicker; there, one requiring lopping only at the summit; while, every now and then, shrivelled plants require pruning in a particular way, or even plucking up by the root."

Mr. Wilson, however, is altogether in error in attributing the *invention* of this mode of cutting to a west-country hairdresser. It came from the north half a century since with the founder of our

establishment, and, after many modifications, is now practised with a success pre-eminently satisfactory—constituting, indeed, a main feature in our treatment.

A practice which we are satisfied has been carried far beyond its just limits, and which has originated in an indiscreet application of principles and facts not thoroughly understood, is that of shaving the head. It is reasonable to suppose, and the supposition is borne out by practice, that cutting the hair will tend to the strengthening of it, to the conservation of its complete nutrition by restricting the length of the hair-tubes through which the nutritious juices have to circulate; that, consequently, the pigment will be duly elaborated, and the nervous energy be maintained; but it is otherwise with regard to shaving, as a moment's reflection upon the anatomy of the hair is sufficient to show. The formative apparatus of the hair is irritated by the razor; as a result, the product of the follicle is thickened, and though, doubtless, the hair as a whole is for a time to the eye increased in quantity, its eventual fall is, we are convinced, hastened through the impairment of the vitality which the proceeding, as we have said, entails.

We would not, however, be misunderstood so

far as to be supposed to abjure shaving as a remedial measure *in toto*. We would simply enjoin caution in forthwith shaving the head—especially in children—when the hair begins to get thin. As long as there has been no destruction of the hair-bulbs by disease, the impending baldness need excite but little apprehension. We have frequently, in cases following upon eruptive fever, obtained all the benefit that could possibly have been desired by local applications, though abstaining from shaving the head against very urgent solicitations of the parents. We therefore enjoin upon parents to abstain rigorously from shaving the head, unless under the best advice. With respect to cutting, it should be done at tolerably regular intervals, not, if there is any tendency to falling of the hair, less frequently than once in a month.

What, then, is to be done when those indications exist which call unquestionably for remedial measures, though not for shaving the head? There is but one thing to be done, and that is to treat each hair individually as a centre of depraved life, of abnormal secretion, and vitiated integrity—each hair, in fact, must have individual treatment apart from that to which it is subjected when cut in the ordinary way.

The system that we have originated, and one upon which we take this opportunity to insist, is that of fining off the point of each hair without respect to uniformity or relative length. The operation being restricted to the part of the hair altogether beyond the hair follicle the absence of all irritations of that delicate structure is at once secured, while at the same time all the advantages derivable from shaving *are* obtained.

CHAPTER XXI.

ON COMBING AND BRUSHING.

It is to the ladies that we owe the invention of the comb and brush. The mythology of the ancients is full of allusions to these implements of the toilette, most of which were of ivory and gold, if Callimachus is to be believed:—

> ". . . . Largos hæc nectaris imbres
> Irrigat, hæc morsu numerosi dentis eburno
> Multimodum discrimen arat. . . . . ."

Suidas states that the Roman ladies being afflicted by an epidemic which deprived them of their hair, implored Venus to stay the plague; and that their supplications were entertained when the goddess had been propitiated by a statue representing herself in the act of combing her hair. At the present day it is not unusual for the petty princes of India to receive ambassadors and administer justice while combing their hair assiduously for an hour at a time. Agalthias mentions that the Franks were indebted to the comb for the luxuriance of their hair.

More importance, perhaps, attaches at the present day to the process of brushing, and infinite are the forms and kinds of brushes manufactured to please the varying tastes of the refined public. The use of brushing is undoubtedly the stimulation of the skin, and, through the irritation of the nervous fibrillæ, with which we have seen the scalp and hair follicles to be supplied, the bringing blood in increased quantities to these structures. If, however, the brush be simply used to the hair and not to the scalp itself, the process subserved is altogether different. In considering the arrangement of the coats of a hair, we have found it to be constituted by superimposed particles of epithelium. Light brushing renders the apposition of these portions of the hair more complete, and, by consequently bringing about an uncontorted condition of the hair-tube, subserves an indirectly nutritional purpose: the circulation of the juices that nourish the hair being thereby facilitated.

The two kinds of brushing are known to the hairdresser under the terms "deep" and "surface" brushing, and both of them are practised in the leading houses—some insisting most on the surface brushing and others on the deep brushing. But this is but another instance of the folly of adopting

fixed rules and methods of treating the hair without regard to each particular case, and the due weighing of the several conditions that render the one or the other most appropriate for a given scalp. The too frequent use of the hard penetrating brush employed in the deep brushing renders the skin callous, until it becomes impossible for the young hairs to push through its parchment-like surface.

We are convinced this indiscriminate brushing is a fruitful source of the number of old heads which of late years we see on young shoulders. Our practice in such cases is to soften and, if possible, reduce the thickened cuticle, generally by means of detergent lotions; but as the promiscuous use of such agents might, in some cases, be attended with injurious results, we forbear giving any form for their manufacture.

Once a day is sufficient for the *deep* brushing; and at all other times in arranging the hair a much softer brush should be used. The *surface* brushing, if properly performed, not only removes any dust or dandriff brought from the roots by the *deep* brushing, but leaves that beautiful *natural* gloss on the hair, and that pleasing finish, which mark at once the *toilette soignée*.

By common consent, the whalebone dandy brush

and iron curry-comb have been banished from the stables of the thoroughbreds; and we hope to see the day when the small-tooth comb and *extra* stiff hair-brush shall disappear from the dressing-room.

CHAPTER XXII.

WASHING THE HAIR.

It is, to say the least, curious that, of all the processes to which modern refinement has subjected the scalp and hair, systematic washing should be the last to become popular and to be even decently performed. If the prevalent custom of each house be noted, even at the present day, it will be seen that washing the head is the exception in nearly all. The cause is to be found readily enough. In the first place, washing gives considerable trouble, and necessitates the adoption of hydraulic and other contrivances in an establishment which few hairdressers can afford, even did their premises admit the modification. The consequence is that the heads of most people in London are never cleaned. They are brushed and combed, and oiled and greased, and perhaps soaped; but they are rarely washed as are the other parts of the body, which, as a consequence, perform their func-

tions much longer than the scalp, upon which, nevertheless, very much more time and money are lavished with so little hesitation.

It will be remembered that we showed the constitution of fat to be a mixture of a base, glycerine, and certain organic acids, which, when made to unite with an alkali, form a soap, leaving the base in a soluble form. We also dwelt upon the gelatinous constitution of the skin of the scalp. The removal of the scalp secretion, which is intimately associated in chemical constitution with fat, is, it will clearly be seen, best effected by the application, in a fluid form, of some alkali sufficiently weak to deprive it of all chemical influence upon the gelatine of the skin, and yet capable of decomposing the fat of the secretion. This desideratum is met with in the yolk of eggs. The plan we adopt is the following:—For each washing the yolks of three eggs are well beaten up in 3 oz. of lime-water, to which is added ½ oz. eau de Cologne. The whole is gradually poured over the head, the hair having previously been cleaned as much as possible by the comb and deep brushing. The attendant then proceeds to form the lather or soap by freely rubbing in the mixture. In about a couple of minutes this preliminary process is com-

pleted, and is indicated by the copious lather which is produced.

The next part of the process here begins, and, astonishing to relate, is the very part omitted by most hairdressers, who actually proceed at this stage to *dry the hair!* Suppose, when one proceeded to wash one's face, one were first to coat the skin with soap, and then, omitting all the water, proceed to wipe off the soap with the towel, what sort of aspect would the face assume? Something analogous, we presume, to the whitey-brown and polished appearance of the wax models in our shop fronts, and perhaps converting the skin into a material as useful for the performance of the functions of skin as is the dazzling coating with which these dolls are invested. Yet such is the plan at present in no mean favour. The hair being thoroughly saturated with the lather, a coarse towel is pressed upon the head, and the lather forced through the interstices. A dry towel is then used to rub off as much as can be rubbed off by this method, and the individual flatters himself that his head has been cleaned. The old story of the play of Hamlet, all but the Prince of Denmark.

Our own plan, then, is at the second stage of the process to thoroughly cleanse the hair and wash

away both the secretions and the application by copious and most refreshing streams of pure water, alternating in temperature, and not to dry the head until no vestige remains of the detergent application. This agreeable douche is rendered still more refreshing by the addition of a little pungent perfume.

The washing being ended, the hair and scalp are sedulously dried. The soft brush is then brought into requisition. Grease is added only where the hair, previous to the washing, appeared unusually dry, and if there is any trace of scurf we are accustomed to abstain from this, and use, in preference, a small quantity of pure lime-juice, mixed with olive-oil.

This method leaves nothing to be desired in the dressing of the hair. The whole process is most refreshing and beneficial, healthful and luxurious. It at once cleanses the head, strengthens the hair, lightens the spirits, removes headache, and recruits the nervous system.

Washing should, let it notwithstanding be re membered, not be resorted to more frequently than once a week. The too frequent application of moisture may ultimately lead to the suppression of all secretion. Nor should the application of a

little unguent ever be neglected by those who, having very dry hair, bathe the head more frequently. This hint we recommend to the notice

of our countrymen living in hot climates, where the frequent bathing of the head is not seldom

followed by partial baldness and alterations of colour.

In illustration of our statement, that these processes, naturally beneficial, may become by a too frequent resort to them actually pernicious, we would instance the fact, that premature loss of hair is infinitely more frequent among the higher classes than among those whose daily vocations consume the time otherwise bestowed upon the luxurious details of the toilette.

To sum up, then. Since we have found the hair to be both a covering and an ornament; in part a secretion, in part an integral portion of the human frame; it is evident that, from the points of view both of appearance and of health, nothing is futile, trifling, or unimportant, which may tend to preserve it in its perfection, and save it from decay or disease. It is, therefore, but a corollary to state that, apart from those local measures we have been at the pains to describe, no general indications having reference to systemic health can be disregarded in treating of the hygiene of the hair, and that the beauty of nature's chief ornament will best be preserved by in no wise infringing upon those laws of conduct and self-guidance which, properly observed, conduce to perfect being, the *mens sana in corpore sano*.

CHAPTER XXIII.

HAIR DYEING.

It is on a crude interpretation of the chemical features of the hair that the process of dyeing is based, as carried out by most of the so-called originators of hair dyes. It is known, for example, that lead unites with sulphur to form a black salt, the sulphuret of lead. It has been thought, therefore, that as sulphur is present in the hair, the application of lead, in solution, is all that is necessary to achieve the wished-for result. Accordingly, as the oxide of lead is soluble in caustic alkalis, a solution of this oxide in lime water is in most frequent requisition. The lime softens the hair, and the lead of the oxide unites with the sulphur, forming a black sulphuret of lead, which stains the hair of a permanent black. But this plausible method is at once seen to be prejudicial, if we reflect on the vital character which we have found the hair possesses, and on the necessary vitiation of this character by such a treatment. The lime actually decomposes the hair, and as the hair-follicle presents an absorptive surface, the products of this decomposi-

tion exert upon the seat of growth their pernicious influence. The lead contained, moreover, in the sulphur salt is highly poisonous, and when we reflect upon the diseases of the nervous system—such as paralysis—that are common among those who absorb lead into their systems, either through their occupations, or by consuming impure water, we are fully justified in censuring the lead process, and stigmatizing the application of a sulphuret of lead to the scalp as a proceeding fraught with the greatest danger. It is on this same principle that the leaden comb acts, and we cannot sufficiently express our surprise that educated people can be found who, while indulging in paroxysms of hygienic virtue if the water in the cistern is found to contain a trace of lead, do not hesitate, month after month, to expose the surface of the scalp to as much lead as it can possibly imbibe.

The practice of dyeing the hair is of very ancient origin; and, as at the present day, it is extensively adopted by all classes of society, whether to veil the ruthless march of time, or to hide the traces of sorrow or disease, it is the bounden duty of every specialist, in whom the confidence of the public is reposed, to use only such applications as he shall be thoroughly satisfied are at least innocuous.

The custom of dyeing the hair assumes every possible form, from the simple anointing with charcoal mixed with oil, as is in vogue with the Feejeeans, to the artistic applications of the laboratory, which disguise the unkindness of nature to so many votaries of fashion and refinement. Captain Hunter, speaking of the natives of Duke of York's Island, says—"The hair is woolly; but it is so arranged by some sort of grease or ointment, and a white or red powder with which they dress it, that it hangs on some like so many candle-wicks, or like the thrums of a new mop reversed, or turned upside down. They are generally as fully powdered as a beau dressed for an assembly. Some have their hair of a yellow, sunburnt colour, others quite red; *none are seen with the hair of its natural colour*. This yellow or red appearance, I believe, may be occasioned by this universal method of powdering, for the powder seems to be made from *burnt shells and coral*, and is really a kind of lime. They generally carry a small gourd, or box, filled with it, about them." The natives of Masseed, according to Mr. Jukes, dress their hair into long, narrow, pipe-clay curls, smeared with *red ochre and grease*. Some of our readers may have a fancy for dyeing their hair to a light colour, nor, as we have pre-

viously observed, in doing so will they be without precedent. Julius Capitolinus informs us that the Emperor Varus was excessively fond of light hair, and, in order to render his own as dazzlingly yellow as possible, he caused it to be sprinkled from time to time with distilled gold. The fashion of sprinkling the hair with gold leaf has of late years been revived by the Empress Eugénie, the material used for the purpose receiving the elegant appellation of *poudre d'or*. It will be a hint worth remembering for such as covet fair hair, and have scarcely enough of the precious metal to emulate the Emperor and the Empress, that the Germans achieved the desired result, with apparent satisfaction to themselves, by the use of a kind of soap, made of goat's tallow and ashes of beech-wood. This soap, which was called Hessian Soap from being manufactured in the county of Hesse, was much used, if we may credit Martial, to stain the German wigs, in order to give them a "flame-colour."

Certain weighty reasons there are, according to the elders of the Church, why the hair should be left undyed. St. Cyprian, who, doubtless, may have enjoyed more than a few opportunities of penetrating the mysteries of the female toilette, affirms

that "the action of staining the hair is worse than adultery." We do not dispute the venerable father's dictum on such matters, or question the inference he likewise draws, that "to blacken the hair argues a detestation of that whiteness which belongs to the head of the Lord," but shall simply call the attention of our readers to a few of the compositions that have had such unholy tendencies.

The antiquarian finds ample scope for his curious enthusiasm when he penetrates the mysteries of female beauty in former times. In the days of chivalry, the minstrels dwelt with great complacency on the fair hair of the damsels of the period. In the nineteenth century fair hair is seldom approved, but by the Pre-Raphaelites. In olden times, however, it was a matter of pride to make the hair not dark, as does the present generation, but light, and as light as possible. In the romances of the middle ages, the heroines are mostly praised for the abundance and lustre of their *yellow* hair;

> "Her yellow hair was braided in a tresse,
> Behind her backe, a yarde longe, I guesse."
>
> CHAUCER, *Knight's Tale.*

and all loyal students of history must be aware that Queen Elizabeth's hair was as yellow as the

modern guinea. Now no queen could have yellow hair without its becoming altogether impossible for any lady to have pretensions to beauty without yellow hair, and, accordingly, in those Armada, love-making, treasonable, gunpowder times, yellow hair was *de rigueur*. Ladies dyed their hair, not as at present a delicate brown or a cerulean black, but a loyal gamboge colour. But Queen Elizabeth was not the only lady of position who has set the fashion of yellow hair; for Galen tells us that, in obedience to the dictates of the Consul Flavius' wife, all ladies of quality dyed their hair yellow. The women, he says, consequently, suffered much from headaches, contracted by standing bare-headed in the sun to obtain this coveted tint, which others sought to procure by the meretricious assistance of saffron. No doubt the class of ladies who enlisted the sun in preference to the druggist were disheartened at the curious tinge imparted to dark hair by the crocus—feelings that may readily be understood by the patient seeker who endeavours, at the present day, to decide between the merits of the leaden comb, the Melanifacient hair dye, the tincture of walnuts, and the nitrate of silver.

Bulwer, in his "Artificiall Changeling, 1653," says, "The Venetian women at this day, and the

Paduan, and those of Verona and other parts of Italy, practise the same vanitie, and receive the same recompense for their affectation; there being, in all those cities, open and manifest examples of those who have undergone a kind of martyrdome to render their hair yellow."

The Gauls, and their German conquerors, rejoiced in this yellowness of their hair, and it took some centuries to reconcile their eyes to the swarthy beauties of their Spanish and Italian neighbours.

We scarcely know what poets have not said about the hair; most of them agreeing in giving red hair to warriors, and tresses of gold to the syrens. Mythological lore informs us that Apollo had golden locks, that Mars had red hair, Venus yellow tresses, and Minerva flaxen braids. Shakspeare was specially fond of light hair. Bassanio thus apostrophises the portrait of Portia:—

> "Here, in her hairs
> The painter plays the spider, and hath woven
> A golden mesh to ensnare the hearts of men
> Faster than gnats in cobwebs."

Again:—

> "Her sunny locks hung on her temples like the golden fleece."

And there is scarcely a poet or painter, from Homer to Tennyson, and from Xeuxis to Holman Hunt who does not evince a decided partiality for fair hair, on which the rays of the sun mostly delight, in the verse or on the canvas, ceaselessly to play.

Besides the custom of risking *coups de soleil* for the chance of dyeing the hair light, we find the ancients resorting to other expedients to attain a similar result. Wigs, when they came into fashion even in this country, were flaxen ; and in Rome, at the time of Ovid, the Roman ladies, when they wore wigs, had them made of the light hair of the Germans. Hair from Germany was sold in Rome for fabulous prices, and not the least valuable of the spoils obtained by the Romans in their conflicts with the Allemanni, were the scalps with fair hair of the conquered. How mutable is fashion ! Yet light hair, Mr. Robertson states, is still held in Brazil to be an indisputable sign of nobility. In France the former fashion of red hair has long since died out; but the Turks, no mean judges in such matters, delight in women with red hair; and the inhabitants of Tripoli are in the habit of using vermillion to make the hair of the desired redness. Mr. Rowland states that the women of Scinde and

the Deccan delight in dyeing the hair yellow and red. In Spain our red-whiskered naval officers enjoy many privileges which the fair sex bestow in consideration of the fiery hue of the Saxon hair. The Chinese call us red-haired devils, "Hung maow kwie"; but Mr. Thorn, who is a thorough linguist, assures us that this dubious epithet is intended for a compliment. "Red," he states, "is beautiful to the Chinese; they extol the peach flower, because of its form and delicate red colour; all the fronts of their houses are red; they use the vermillion pencil."

"Take," says Madame Voiart, in a work now forgotten, "a quantity of burnt cork and incorporate it with *pommade à l'Heliotrope*, and with infusions in river water of the bark of oak, willow, walnut, pomegranate, black mulberry, myrtle, arbutus, senna, raspberry, fig, artichoke; wash the hair with this composition and it will at length render it black." Any lady desirous of altering the colour of the hair from that Nature has assigned to the hue of soft mud or slate pencil, will find this an excellent recipe. There is perhaps a little nastiness about it, as there is in her second prescription, which recommends gall nuts, cypress cones, ivy berries, and seeds of red beet boiled in wine; but both of these recom-

mend themselves by their simplicity and cleanliness when compared with another infallible dye.

"Break and pound in an iron mortar a pound of gall-nuts and boil them in olive oil till they grow soft: then dry them, reduce them to a very fine powder, with which incorporate equal parts of powdered charcoal of willow, and common salt, prepared and powdered; to this add a small quantity of lemon and orange peel, also dried and well pulverized. Now boil the whole in twelve pints of soft water till the sediment at the bottom of the vessel assumes the consistence of a black syrup; with this syrup anoint the hair which you wish to stain, cover it with a cap till dry, and then comb it. This anointing is to be renewed once a week *lest it should cause the hair to turn red, which there is some chance of its doing.*"

Such was the advanced state of the art of hair dyeing in the time of Madame Voiart. But we must be careful of rashly ridiculing a Materia Medica which, in the present condition of science, furnishes, as the most efficacious remedy in consumption, a liniment composed of the dung of the boa constrictor! Let us hope that in those days the medicaments mixed up in apparently so hetero-

geneous a jumble, possessed virtues to which our present benighted race is lamentably oblivious.

As we have said, the basis of empirical hair dyes is a chemical. For the most part, the active ingredient is lead, but certain other nostrums owe their deleterious efficacy to lunar caustic. The two preparations most popular in France are L' Eau d' Egypte and L' Eau de Chine. The basis of both of these, as of our former much vaunted Grecian Water and Essence of Tyre, is the nitrate of silver or *lapis infernalis*, the infernal stone. Any one who has had the misfortune to taste a bit of this substance can never forget the torture he suffered for hours afterwards; and the effects can readily be apprehended by observing the black stain left on the skin when the lunar caustic happens to have come into contact with it. The caustic does, in fact, actually destroy the skin at the part to which it is applied; thus perverting the nutrition of the scalp, destroying the hair-follicles, and inducing, as a necessary consequence, baldness and disfigurement. Nor has the seeker after raven locks the consolation even of staining the hair to the desired colour. The nitrate of silver does not produce a permanent black; for the stained hair, on exposure

to light, soon becomes purple, and even of a reddish tinge, like blood, which not unfrequently places the victim in a most lamentable predicament.

We do not feel called upon to state, in a treatise like the present, the method we have ourselves brought into extensive use, and which we have successfully matured through a long study directed to the effect of re-agents. We would, however, warn the public,—as we have seen in considering the chemical features of the scalp and its textures, that the basis of the hair and epidermis is a substance closely allied to albumen and gelatine, that in the fabrication of a hair dye it is essential to bear in mind the vitiating influence of metallic solutions upon such a basis, and that in the use of vegetable astringents it is necessary to remember the affinity of gelatine for tannin, and the production of the insoluble tannate of gelatine at the base of each hair when improper vegetable solutions are employed.

A formula may, however, be not unacceptable to such of our readers who still preserve a fondness for old usages. The hair should first be washed with some alkaline solution, such as weak soda or potash. When the hair is dry, the application may be made with a soft brush.

Nitrate of silver	Two drachms and a half.
Distilled water	Six ounces.

The following is a good dye, but has an unpleasant smell from the decomposition of the sulphuret of potassium employed.

Sulphuret of potassium . .	Two drachms.
Water	One ounce and a half.

This is termed the mordant, and is applied first. When dry the solution of silver.

Nitrate of silver	Two drachms.
Water	One ounce and a half.

If the shade required be *brown*, a less quantity of the silver salt should be employed.

The smell may be obviated by using a mordant made by pouring half a pint of boiling water on three ounces of powdered gall-nuts, and straining when cold.

There are other dyes of metallic basis employed to give the hair a brown tinge. In practice this is unsatisfactory. Black is black, but brown has a peculiar natural aspect of its own that chemical art cannot hope to rival. In France, however, a so-called brown dye is employed, having for mordant a solution containing as much as it will dissolve of prussiate of potash; and, for re-agent, a saturated solution of blue stone (sulphate of copper), to

which ammonia has been added in quantity sufficient to throw down the black oxide of copper, and again re-dissolve it.

Mr. Piesse gives us a receipt for a liquid hair-dye not blackening the skin, of which the more adventurous of our readers may, perhaps, be disposed to make a trial.

"Dissolve in one ounce of liquor potassæ as much freshly precipitated oxide of lead as it will take up, and dilute the resulting clear solution with three ounces of distilled water. Care must be taken not to wet the skin unnecessarily with it."

Having no intention of publishing the receipt of that which, in our experience, is *the best* dye, we think it unnecessary to trouble our readers with more forms for this article.

CHAPTER XXIV.

HAIR GREASES AND WASHES.

UNGUENTS, and such like substances, simple or perfumed or medicated, have, in common with oils, been in use from time immemorial by both the sexes. The abuse of these at the present day is but too familiar; no "servant-gal" dispenses with her hair-oil, no school miss but has her own pet pomatum, cosmetique, and bandoline. Indeed, the practice of greasing the hair obtains in all countries, even the most barbarous. The Esquimaux use the train and seal oils, the women of Greenland oils from fish. Turtle oil and alligator fat are in much request among the most fashionable of the South Americans. By the Mediterranean, olive oil is used; castor oil is much esteemed in the Pacific Islands, and again, some of the African tribes are extremely partial to the ghee or fluid butter. A run has been established at one time upon the fat of ducks and serpents; at another upon the oil of the lizard; and again, so mutable is fashion, upon crows'-liver, swallows'-dung, and bears'-grease. The lower orders take to lard, and

in our female prisons the women will sometimes willingly incur a week's solitary confinement if they can but filch some of the matron's tallow-candles.

All applications misused act injuriously upon the scalp and hair. In the first place, they mingle with the natural secretions and clog up the hair follicles; and in the second place not unfrequently act as direct irritants, producing inflammation of the scalp and subsequent loss of the hair. But it is not to be imagined that the cautious employment of such substances can be dispensed with. On the contrary, the exception is to find a head of hair which would get on well without them. The bulbs of the hair are, in most people, insufficiently nourished, the hair itself speedily, unless anointed, assumes a hard and crisp appearance, the sebaceous glands fail in function, the hair is insufficiently guarded from atmospheric and extraneous influences, and unless this condition be mitigated, the hair suffers as a necessary consequence.

In those persons whose glands are in a state of thorough functional activity the hair is but little encumbered by the dried flakes of epithelium which are termed scurf, and is mostly soft, pliable, and silky. When the natural oil is deficient hair soon loses its curl, and when such or other conditions

indicate, the nourishment possessed by unguents and oils should be supplied, of which latter the pure vegetable oils are certainly to be preferred.

In the preparation of hair greases it is essential that in the first place a perfectly inodorous and pure grease, as a basis, be obtained. It is scarcely possible to impart a delicate odour to lard or suet retaining the slightest smell derived either from the pig, the ox, or the sheep. The preliminary expenditure for cleansing is never begrudged by the manufacturer, for he is well aware that it would cost him more to mask the smell than to rid the grease of the noxious adjunct altogether.

The fat about the loins of the animal is mainly selected, in consequence of its greater firmness and density. In order to get rid of the membranes that we have formerly shown make up with the fat itself the adipose tissue, the whole is melted over a slow fire, then strained through flannel or linen and while still liquid is poured into a bladder, where it solidifies and is called "prepared." Frequently salt is added to preserve it, but before use, the lard should be always most carefully freed from salt, which on delicate skins has an irritating influence. When the lard is melted, alum is not unfrequently added to the mass, and careful washing is needed to

remove all traces of the salt. The washing is effected in small quantities of about a pound each at a time. It is placed on a slate slab and having been worked about thoroughly in the same manner as paints are ground in oil, water is allowed to trickle over it until all traces of impurity are washed away. The lard is then remelted, and, when cold, is ready for use. The substance that best secures the grease from becoming rancid is benzoic acid, which in the hot fat is perfectly soluble.

This description of hair grease, prepared and perfumed according to any of the subjoined forms, may be purchased in most hairdressers', perfumers', and chemists' shops at moderate rates. The very cheap articles sold at prices but little above the value of the bottle or pot containing them are made by mixing meal with water, and working a little coarse fat into the paste. The perfume generally used is "spiki," or some other strong, coarse, essential oil.

The hair must be strong, indeed, to stand a lengthened course of these mixtures :—

CIRCASSIAN CREAM.

Purified lard	1 lb.
Benzoic suet	1 lb.
Almond oil, coloured with alkanet root .	1½ lb.
Otto of roses	¼ oz.

Castor Oil Pomatum.

Castor oil	½ lb.
Almond oil	½ b.
Pine lard	1 lb.
Ess. oil of Bergamot	1 oz.
Otto of roses	12 drops.

Marrow Oil Pomade.

Purified lard	1 lb.
Olive oil	1 lb.
Palm oil	¾ oz.
Ess. oil of Bergamot	¾ oz.
,, lemon	1¼ oz.
,, cloves	20 drops.

The "Original" and "Genuine" Bears'-Grease.

Purified lard	1 lb.
Almond oil	¾ lb.
Palm oil	2 oz.
Huile de rose, ,, jasmin, ,, acacia	of each 1½ oz.

Philocome.

White wax	2½ oz.
Almond oil	1 lb.
Otto of lemon	½ oz.
,, Bergamot	¾ oz.
,, lavender	1½ dr.
,, cloves	20 drops.

For all the above preparations the fats should be melted in the oils by a water bath of the lowest possible temperature; thoroughly stirred till nearly cold, and the perfume then added.

Should any of our readers be inclined to try the original "pomatum"—so-called from *pomum*, an apple—here it is :—

Stick an apple all over with cloves and other spices and suspend it in the open air for four days ; pour melted lard upon it and let it stand fourteen days ; remelt the whole ; strain, and you have the pure pomatum of Dr. Fontaine who flourished in 1710.

It will be seen, from our former remarks on this subject, that all irritating ingredients should be carefully omitted in preparing an unguent to supply a defective secretion of fat in the hair follicle; and our practice, in common with many leading houses, has been to substitute the following method for the use of essential oils, which are necessarily more or less irritating.

FORMS FOR GREASES PREPARED WITH PURE FRENCH POMATUMS, INSTEAD OF ESSENTIAL OILS.

French rose pomade	1 lb.
Huile de jasmin	5 oz.
,, cassie	1 oz.
,, fleur d'orange	2 oz.
Vanilla oil	½ lb.

French violet pomade	6 oz.
,, rose pomade	6 oz.
Pure almond oil	8 oz.
Otto of Bergamot	2 dr.
Rose pomatum	1 lb.
Jasmin	1 lb.
Cassie	¾ lb.
Pure almond oil	2 lb.

Tuberose pomatum	½ lb.
Jasmin	½ lb.
Almond oil	½ lb.
Otto of Nicoli	1 dr.
,, roses	2 dr.

As before get the greases and oils together at the lowest temperature consistent with a thorough admixture.

The pure French pomatums are imported principally from Grasse and Nice; they are obtained by a process called *maceration*, thus:—

The purified fat, generally lard, with a little deer-suet, is put into a shallow porcelain pan and melted. The flowers, according to the odour required, are then strewn over the liquid fat and allowed to stand forty-eight hours; the fat, having a natural affinity for the otto of flowers, draws it out of them, and thus becomes highly perfumed; after straining, the process is repeated again and again according to the required commercial value.

Fat, indeed, is the vehicle in which all pure odours are imported, they are *washed* out in spirit for the choicest perfumes for the handkerchief, and used, as above, in hair greases by first-class manuturers.

Hair Washes.

Before leaving this part of our subject, we shall perhaps be expected to give a few receipts for hair washes; annexed are the most popular:—

ASTRINGENT HAIR WASH.

Rosemary water	1 pint.
Spirits of wine	¾ pint.
Esprit de rose	4 oz.
Extrait de vanille	1 pint.

Filter through magnesia paper.

EXTRACT OF FLOWERS.

Extrait de jasmin, ,, fleur d'orange, ,, rose, ,, tuberose	of each ¼ pint.
Extrait de vanille	½ pint.
Rose water	1 quart.
Spirits	1 pint.

EAU ATHÉNIENNE.

Boil ¼ lb. of sassafras wood in ½ gallon of rose water; when cold, add ½ pint of spirit and ½ oz. of pearlash.

The following, published by Mr. Startin, is said to be very efficacious when the hair is falling off:—

Rosemary water	1 gallon.
Spirit of sal volatile	8 oz.
Tincture of cantharides	2 oz.
Glycerine	4 oz.

Having noticed an increasing demand for liquid preparations for the hair, we have lately turned our attention to the practicability of combining spirituous and oleaginous productions. In this seeming chemical paradox we have entirely succeeded, and, under the name of "Euchrisma," offer the results of our labours to the public.

DEPILATORIES.

Such being the appliances for promoting the

growth, we must say a few words on the subject of depilatories, or those compounds which have for their object the removal of hair. The best remedy is unquestionably the tweezers with patience, for unless the hair bulb be removed the hair will continue to spring from it. Even where the bulb is extracted the hair follicle may persistently continue to secrete, but, at least, in this latter case the resulting hair is but at best a kind of down, whose presence is, at all events to a certain extent, endurable. The razor is a deceptive remedy, inasmuch as the hair always grows the stronger after its use, and in all cases leaves the shaven spot of a more or less deepened hue, more objectionable to the eye than the hair itself. Failing the courage indispensable to the employment of the tweezers, resort may be had to the destructive agency of lime. We might give an infinity of recipes for depilatories, but the only one worth having is that which is the best. It consists of equal parts of tersulphide of arsenic and slaked lime. They are intimately mixed, and made into a paste with a little rose water. This is carefully applied upon the hair, and allowed to remain for a few minutes. The whole is then removed with a paper knife, and the skin thoroughly washed and smeared with a little cold cream.

CHAPTER XXV.

COMMERCIAL VALUE OF HAIR.

HUMAN hair for commercial purposes is generally procured from the poorest class of peasant girls. In making up ornamental hair, women's hair is almost exclusively used—that of men being too coarse. When cost is no object, the natural curling points of children's hair are used in gentlemen's wigs.

A limited quantity is obtained in Ireland, Scotland, and some parts of England, either by itinerant collectors (chiefly broken-down barbers), or by country hair-dressers who cut young women's hair on market days; by far the greater proportion, however, comes from abroad. Some fifty years since, large quantities were imported from Holland and Germany; now-a-days these countries produce barely enough for their own consumption, and we are supplied principally from France and the north of Italy. Belgium contributes also a small share,

which is useful in yielding light colours seldom met with in more southerly countries. These very light shades were at one time very valuable, when it was the fashion for old gentlemen to wear light-coloured perukes, no matter what might be their own natural shade; so that men, who in their youth rejoiced in raven locks and a swarthy complexion, Adonized themselves in their old age with a peruke "*blond d'enfant*," which must have formed a most ludicrous contrast.

In our day, the true artist in ornamental hair, recognizing the principle that "Nature seldom makes mistakes," bends all his energy, and uses all the appliances of his art, to produce an exact copy of her original work.

The principal parts of France where hair is collected are Normandy, Brittany, and Auvergne. Travelling hair-cutters—generally Jew pedlars—attend the fairs in the various market towns, and then erect a small booth, in which the peasant girls barter their rich tresses for wearing apparel or trinkets; these men never pay in money, and thus realize a double profit. The girl, on her side, is glad enough to conclude a bargain which she considers entirely in her favour, as she is not considered to have attained womanhood until her beautiful

tresses have been taken off and replaced by the close-fitting *bonnet* of the country.

The hair thus obtained is sent to some wholesale dealer, who again sells the precious bales to the hair-merchants of Paris and London. It now undergoes a process of cleaning in bran or sand, and is then *drawn off* into even lengths. The long and short, curled and straight, being the first distinctions, to be followed by a further assortment as to shade.

The wig-maker takes his patterns to the merchant and selects in ounces and drachms the necessary quantity for each article. By this time the peasant girls' hair has risen to a price varying from five shillings to fifteen shillings per ounce. and much higher prices are often realized for unusual lengths or shades.

Various substitutes for the expensive hair of Europe have been tried. In 1849 and 1850, large quantities of Indian hair were brought into the market, but it was found too coarse; its uniform dead-black colour was also against it.

In 1851, Mr. Rimmel, of the Strand, exhibited in his case at the Crystal Palace, some specimens of the "formium tenax," a vegetable fibre, dyed in various shades to imitate human hair; for appear-

ance the substitution was sufficiently good, but it was wanting in that *flexibility* so essential to the *working* of hair. It is still used, however, in the short plaits which form the *coronets* of the lower orders.

Horsehair is also used by people who are not *particular to a shade;* and in this they have imitators in the interior of Africa: for we read in Dr. Livingstone's travels that the women of Londa twist buffaloes' tails into their own woolly hair to make it appear more abundant. Place on the opposite side of the account the horsehair frizzettes of London and Paris, and but little, we fear, stands to the credit of civilization.

The caprices of fashion have been shown in the arrangement of the hair as much as in anything; and to the eye of the philosopher who seeks a cause for every change, there may appear some connection between certain phases in the political world, and the contemporaneous mode of dressing the hair. In the reign of Queen Anne, patches worn by ladies on the face, served to indicate the political bias of the fair wearer, and as changes of opinion were not unfrequent, ladies who in the morning were patched *à la mode du Tory* often appeared in the evening adorned *à la mode du Whig.* These open mani-

festations of party-feeling were, no doubt, the result of the intrigues for which that reign was remarkable.

Patches were at the same time much worn in France, where they were called *mouches:* but amongst the French ladies they do not seem to have had a political significance. They merely indicated the disposition or humour of the wearer. A *mouche* worn at the corner of the mouth was called a *baiseuse;* at the corner of the eye, it was esteemed *passionnée;* on the lips, it imprinted the character of *coquette;* placed on the middle of the cheek the *mouche* was called a *galante;* and on the nose, an *effronté;* on the forehead, the *mouche* assumed a dignified position, and was called a *majestueuse.*

CHAPTER XXVI.

COSTUME—HAIR DRESSING.

CERTAIN styles of dress have been adopted in imitation of the whim, or in admiration of the good taste of persons exalted by their rank or distinguished by their beauty. At one time shoes terminating in long curved points were the prevailing fashion, because the reigning monarch had adopted this *chaussure* to conceal the deformity of his feet. Bands of velvet fastened with a brooch were, at another time, worn by ladies round the throat because a court beauty had adopted that mode of concealing a wart that disfigured her appearance. We also find individual peculiarities of distinguished personages influencing the costume of an entire nation. Under despotic monarchs the head-dress is almost invariably very high; where democratic principles prevail, the standard of elevation is less; and pure republics are distinguished by extreme simplicity.

We cannot at present devote so much space to the subject as we could wish; but as France and England are the two nations whence Fashion issues her decrees, we will endeavour to strengthen our position, by illustrations drawn from the courts of these two countries.

At the commencement of the reign of Louis XIV., the style of hair-dressing assumed a simpler form than what prevailed under his predecessors, but this simplicity was the result of personal flattery to the youthful monarch, who was remarkable for the beauty of his hair, which hung in flowing ringlets adown his shoulders; and in imitation of

the royal example, flowing locks became the fashion. Gentlemen to whom nature had not been lavish in

this respect betook themselves to the aid of art; hence the origin of those enormous perukes that are introduced in the portraits of that period. Amongst the *coiffures* of young ladies at that time,

we find one that gives a very youthful expression to the face. The hair is cut in regular rows and of different lengths, and when curled, the last range falls a short way below the ear. This mode of wearing the hair, which a French lady once described to us as "*très flatteuse*," always gives a juvenile air to the countenance. But this simple style did not long obtain under Louis XIV. Monarchical principles prevailed, and curls, instead of falling round the face, were trained high above the forehead, which was left quite bare. The rows of curls thus elevated were adorned with strings of

pearls, and a large jewel was worn in the centre, above the forehead. The back hair was curled, and allowed to flow down the shoulders; and from amid these ringlets, bright jewels gleamed, like fire-flies in an Indian night.

Were we inclined to speculate, we might trace the influence of public feeling in this *coiffure*. If monarchical principles were represented in the towering curls of the front, the love of the fine arts, which obtained under the *Grand Monarque*, found a tribute in the flowing tresses that hung down behind.

During the same period, the ladies of England wore preposterously high head-dresses, so much so, that one-third of a woman's height was above her forehead. These unsightly encumbrances were laid on wire frames, and covered with silk or gauze. They were a French importation, and known as *commodes*. The abomination was so great, that the thunders of the pulpit were awakened, and a popular preacher compared the ladies of that day to the artificers of Babel, because with their lofty towers, they seemed "to threaten the skies and defy heaven itself."

Head-dresses varied very much during the reign of Louis XIV.; and after all, it must be admitted

that the monarchical principle was being sapped, even when it reached its highest tone, in France. Accordingly we find the height of head-dress vacillating, and, at one time, it appeared as if the King wished to pronounce sumptuary laws with regard to head-gear, forbidding gold lace as a head ornament to any lady below the rank of a countess. He also condemned the height of the *commode*, which was accordingly abridged.

Under Louis XV. high head-dresses again reigned supreme. The hair was turned completely off the forehead, and, by the aid of cushions, raised considerably above the head. The summit was crowned with flowers, with lace, or plumes of ostrich feathers. The *commode*, too, was revived; but it seems to have been a very unbecoming head-dress, concealing the hair, and having in front a tall, fan-shaped ornament in lace, giving an unicorn character to the wearer.

We are all familiar with the portraits of Marie Antoinette, and the *coiffures* generally worn at the court over which that unhappy Queen presided. Powder and pomatum were then in high vogue, and the weight that some ladies carried on their heads was really marvellous.

Madame d'Oberkirch, in describing a visit she

made to Paris in the reign of Louis XVI., says:—

"This blessed 6th of June she awakened me at the earliest dawn. I was to get my hair dressed, and to make a grand toilette, in order to go to Versailles, whither the Queen had invited the Countess du Nord, for whose amusement a comedy was to be performed.

"These court toilettes are never ending, and this road from Paris to Versailles is very fatiguing, especially when one is in continual fear of rumpling her petticoats and flounces. I tried that day, for the first time, a new fashion—one, too, which was not a little *génant*. I wore in my hair little flat bottles, shaped to the curvature of the head; into these a little water was poured, for the purpose of preserving the freshness of the natural flowers worn in the hair, and of which the stems were immersed in the liquid. This did not always succeed; but when it did, the effect was charming. Nothing could be more lovely than the floral wreath crowning the snowy pyramid of powdered hair."

An entry in the journal of the above-named lady says:—"I was obliged to rise at six o'clock to get my hair dressed, so great was the demand for hair-dressers."

But the Revolution demolished these high structures in France, and in the revulsion of feeling that effaced all traces of monarchical rule, nothing would be tolerated in dress that did not recall the republics of classic antiquity. Simplicity, in some cases, almost approached nudity. The hair submitted to the law of opinion, and heads *à la mode du Titus* were everywhere to be seen. Hoops were thrown aside, and dresses which almost defined the anatomy of the figure became the fashion.

Revolutionary opinions produced a thorough change in every article of dress. Gentlemen appeared in simple hunting coats, and wooden shoes; the gold-tipped cane was replaced by a knotty blackthorn. A decree was passed by the revolutionary chiefs, prohibiting the wearing of black wigs *à la mode du Jacobite.*

During the Consulate, a steadier tone was manifest, and the elegant and graceful Josephine displayed the same inimitable taste when she was Madame la Consule, as afterwards when she shared the Imperial throne.

To dress the hair *à l'antique*, was the ambition of the ladies of the Consulate; and it must be confessed that no better models can be found for

those whose features resemble a Flora, a Venus, a Minerva, or any other marble goddess. In our own land, we daily see faces whose pure and regular beauty might vie with the masterpieces of Grecian sculpture; but we doubt whether the generality of our plain, round English faces would be improved by a strictly classical head-gear. A style of feature, which may be called composite, requires an analagous *coiffure*, and it is this tact in adaptation that calls forth the skill of the artiste. A round, rosy face, with *nez retroussé*, would look far better peeping through a shower of clustering curls, than surrounded by severe close-pressing bands.

Having said something of the modes that prevailed in France, from the time of Louis XIV. to the Consulate, we might naturally be expected to do as much for our compatriots, and trace the progress of opinion in England, as manifested in various changes of head-gear, hoop, or shoe. But we find, generally speaking, that in matters of costume, the English are not an inventive people, and in affairs of the toilette, are content to be imitators. This may result from the mixture of races that combine to form the Anglo-Saxon. He feels it no degradation to adopt the modes of his

Gallic neighbours, remembering that he has Norman blood in his veins. If the imitation is not always successful, we must look for the disturbing cause in the Saxon sturdiness that so long refused to amalgamate with the French conquerors. But be this as it may, we must not forget that during the Protectorate, French fashions were little esteemed, and the stern republicans who decapitated a king, forbore all vain adorning of their own heads.

The flowing locks, whether natural or artificial, that distinguished Charles the First and his courtiers, were the subject of constant animadversion

from the pulpit. These strictures prepared the way, no doubt, for the exterminating scissors' war,

of which the Roundheads were the representatives. The Roundheads merely wore sufficient hair to cover the head; the Cavaliers, on the other hand, if they found the full length of their own hair insufficient to gratify their vanity, or inadequate to the expression of their political opinions, did not hesitate to have recourse to a wig.

But with the Protectorate, came a violent reaction. That was, indeed the heyday of perruques. The quantity of hair required to make one of these head-coverings must have been very great. The curls fell adown the shoulders in heavy masses, sometimes descending even to the waist. In the reign of Charles, the extravagance in dress reached an alarming height, until the monarch himself seems to have been appalled at the power of the spirit he had raised. We find him beginning to act an example of sobriety in dress, and speaking against the extravagance of his subjects. But this effort at good behaviour was too much for the merry monarch, and he soon relapsed into his old habits.

Periwigs were as much the mode during the reign of William and Mary, as they had been in the time of Charles the Second; and the head-dresses of the ladies rose to as great a height as

they had ever attained. But, fluctuating with public opinion, they again declined, and again they rallied, and continued to sink and rise; so that a writer of that day, says, "Within my own memory, I have known a lady's head-dress rise and fall above thirty degrees."

This fluctuation in the height of head-dresses was due to the introduction of fresh fashions from France; and whatever change was wrought in head-gear in that country was also felt in England; still, as a general rule, the love of high head-dresses prevailed till the commencement of Queen Anne's reign. Portraits of her Majesty at a later period, represent her in flowing curls and a simple style of head-dress.

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