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ON RINGWORM.



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Fig. 2.



Fig. 1.

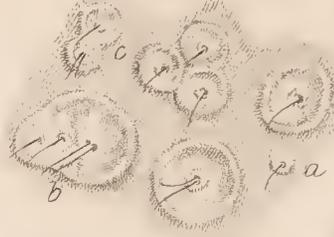


Fig. 3.



Fig. 4.

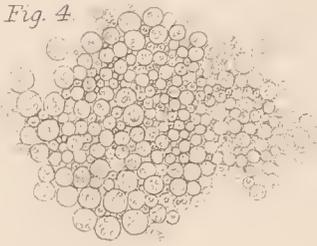


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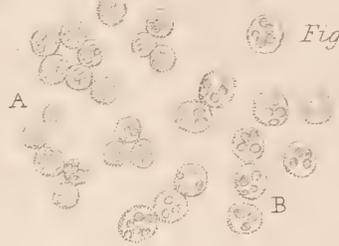


Fig. 6.



Fig. 7.

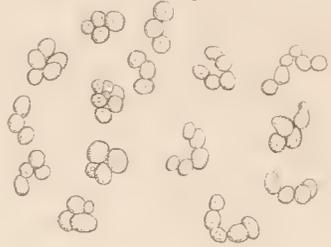


Fig. 8.



Fig. 10.



Fig. 9.

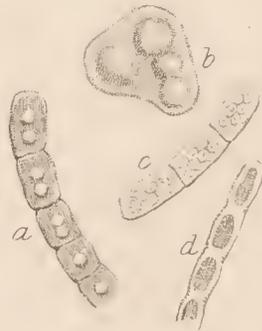


Fig. 11.

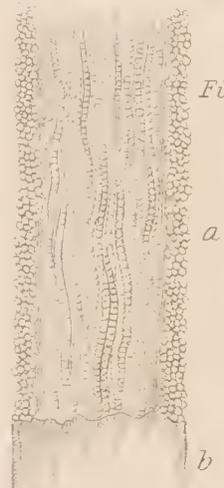


Fig. 12.



ON
RINGWORM:

ITS CAUSES, PATHOLOGY, AND TREATMENT.

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P R E F A C E.

THE diseases of the scalp were denominated **TINEA** by Sauvages, who was probably led to the adoption of that term from observing that, in certain of these affections, the hair is broken off near the skin, and has the appearance of having been eaten away by the moth-grub, or moth-worm. A second observation, of frequent illustration in connexion with these diseases, is, their common occurrence in a circular form, and from these two sources is derived the popular name by which they are known—namely, **RINGWORM**.

Taken in its strict acceptation, the term “Ringworm” ought, therefore, to be restricted to diseases producing a brittleness

of the hair, and giving rise, as a consequence, to its breaking off near the skin. This is the sense in which the appellation is employed in the following treatise; the diseases coming under this designation being the Common Scurfy Ringworm (*trichonosis* furfuracea*), and the Crusted or Honeycomb Ringworm (*favus*).

If in addition to the brittleness of the hair above noted, we take, as a character of Ringworm, a dry and scurfy state of the scalp, we are in possession of certain prominent signs by which this disease may be easily distinguished.

There are only two diseases which come properly under the denomination of Ringworm, and both of these are marked by an absence of secretion. The diseases of the scalp, in point of fact, admit of a natural division into the dry and the moist; the dry eruptions, with an exception presently to be mentioned, being the Ringworms; and the

* Der. *θρίξ*, capillus; *νόσος*, morbus.

moist eruptions comprising Eczema, Impetigo, and Ecthyma.

The moist eruptions are universally acknowledged to be simple in their nature, and non-contagious; so that those which fall under the suspicion of contagion, and those which carry with them the stamp of popular opprobrium, are the dry eruptions. Two of the dry eruptions affecting the scalp constitute the exception to which I have just alluded; they are Pityriasis capitis and Psoriasis capitis, members of the family of the Squamous Diseases, and distinguished from Ringworm; firstly, by causing no alteration in the hair; and secondly, by being generally found on other parts of the body at the same time as on the head.

The student must acknowledge the diagnosis of diseases of the scalp to be greatly facilitated by an arrangement of this kind; and having got rid of the moist eruptions, the distinction of the true squamous affections from the Ringworms is a labour easily

accomplished. Had this classification been insisted upon by Willan and Bateman, Ringworm would not, as it now is, be a term involving considerable obscurity of meaning. But these authors are themselves the cause of much of the confusion which has so long prevailed, from seeking to include so many and such opposite diseases under the same generic designation. Willan and Bateman, however, divide the blame in this respect with their predecessor Celsus, who, as Bateman remarks, "included the moist and ulcerating as well as the dry and furfuraceous eruptions of the scalp under this (*porrigo*) denomination."

Willan has classed the Ringworms, with four other diseases, under the generic appellation *porrigo*, a word which signifies scurf, or scales, on the head, and is derived from the Latin, *porrum*, an onion, the structure of this bulb being laminated, or, as it were, scaled. Bateman has fallen into the singular error of ascribing a different signi-

fication to the word "Porrigo," for in speaking of one of the species of this genus, he observes—"It has been supposed that the similarity of the odour of this discharge to that of garlic (*porrum*) gave rise to the appellation of *porrigo*."

Of the six species of *Porrigo* of Willan two only come up to the idea conveyed by that word—namely, *Porrigo furfurans* and *Porrigo scutulata*; and these undoubtedly are the same disease, being, in fact, the *Trichonosis furfuracea* of the present treatise. Of the four remaining, one only is a Ring-worm—namely, the *Porrigo lupinosa* (*favus*), and has a place in this volume. The other three, or rather two, diseases (for *Porrigo larvalis* and *Porrigo favosa* are the same) have no claim to the signification implied by their generic title. The *Porrigo decalvans* must also be excluded, for it is a disease, not of the surface of the skin, but of its deep tissues.

Willan and Bateman are authorities of

such weight in regard to diseases of the skin, that it may be doing a service to medical science to inquire how far they have fulfilled the task of describing them with accuracy. In respect of the first-named species—namely, *Porrigo furfurans* and *Porrigo scutulata*, there can be no doubt that they have taken two stages of the same disease, and described them as distinct and separate affections; and they have further committed the error of calling the papulæ of this disease “pustules.” They have not been more happy in their account of *Porrigo lupinosa* (*favus*), for the perusal of Bateman’s observations on this disorder suggests the conclusion that the description has been drawn rather from the works of the older writers than from nature.

The whole gist of Bateman’s description of *Porrigo lupinosa* (*favus*) lies in the following quotation from the work of Haly-Abbas: “*Quinta est lupinosa, sicca et colore alba, lupino similis.*” Now, passing over the

error of calling the crusts of this disease "white," the description should have run thus—Like the concave side of a white lupine seed which has been gathered before it was perfectly ripe, and has collapsed during drying. But however clear this definition may have been to the Arabians or to the Romans, lupine seeds are not sufficiently plentiful in Britain to make us familiar with the appearance which is intended to be conveyed, for it is not every white lupine seed which offers the depression referred to.

The confusion and ambiguity arising out of the above causes might of themselves warrant a new description, drawn from the life, of these diseases. But the facts developed by the microscope within the last few years in explanation of the pathology of diseases of the scalp, and the deductions which flow out of these investigations, appear to the author to render such a step imperative on one who, like himself, abounds in opportunity and love for the undertaking.

The author claims to add another purpose to his labour—namely, the endeavour to prove that Ringworm, if not wholly non-contagious, is at least much less communicable than is at present believed. Should he fail in his design, the patient will be in no worse case than previously to this inquiry. Should he succeed, a weight of anxiety will be removed from the minds of parents whose children are afflicted; the sufferers will no longer live in a perpetual state of quarantine, at the sacrifice of their comfort and education, and in some instances of their prospects in life; and society will be relieved from the apprehension, and, by so much, from the reality, of a serious domestic scourge.

I have purposely refrained in this treatise from using the word "*scall*," a term which, like Ringworm, has been very loosely applied to diseases of the scalp. In its original signification, the word means "bald" (*skalladur*), and would seem to be applicable only

to those affections which occasion baldness, without reference to any particular form of disease, so that its use would necessarily lead further into the confusion, out of which I hope to extricate the subject. Moreover, an arbitrary signification has been assigned to the word "scaldhead," which would prove a fruitful source of perplexity. For example, if we turn to "Johnson's Dictionary," we find the following explanation of the latter term—"a loathsome disease, a kind of local leprosy, in which the head is covered with a continuous scab." It has been suggested to confine the term to the moist diseases of the scalp, but it will be more consistent with clearness and perspicuity to banish it altogether.

In the following pages I shall first describe the Crusted or Honeycomb Ringworm, or favus, and devote a second chapter to the Common or Scurfy Ringworm, or trichonosis furfuracea. In a third and final chapter, I shall make some observations on those diseases

which are analogous to, or are liable to be mistaken for, Ringworm, such as *Plica polonica*, or, as I propose to name it, *Trichonosis plica*, and *Alopecia areata*;* and I shall conclude with a brief survey of the pathognomonic and diagnostic characters of the General and Special Diseases of the Scalp.

The illustrative steel-plate is engraved by Mr. William Bagg, from drawings made by myself with the aid of the camera lucida.

* Plenck. *Doctrina de morbis cutaneis*.

*55, Upper Charlotte-street,
Fitzroy-square,
October, 1847.*

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DESCRIPTION OF PLATE.

Fig. 1.—A group of crusts of Favus; natural size. The prominent rim; the cupped surface; the aperture of the hair-follicle; the slight elevation frequently surrounding the aperture of the follicle, and forming a kind of crater; and the one or two hairs issuing from the follicles, are all shown.

a, is an incipient crust; *b*, is a crust which has extended so as to include two neighbouring follicles; *c*, are separate crusts becoming confluent as a consequence of growth.

Fig. 2.—A side view of a crust of Favus, showing its elevation from the skin.

Fig. 3.—A section of a crust of Favus, showing its thickness; the papilla corresponding with the hair-follicle; and its relation to the latter.

a, is the hair enclosed in its follicle.

Fig. 4.—The under surface of the crust of Favus magnified 310 times. It is composed of granules and corpuscles closely aggregated together, the former

occupying the interstices of the latter. The corpuscles are seen to be filled with nuclear granules. See pp. 12, 18.

Fig. 5.—Pus-corpuscles from an incipient favous deposit; magnified 310 times.

A, pus-corpuscles without admixture with water; measuring $\frac{1}{3000}$ of an inch in diameter.

B, the same corpuscles swollen to the size of $\frac{1}{2000}$ of an inch by the addition of water; the riper secondary cells or nuclei are brought into view. See p. 17.

Fig. 6.—Favus-corpuscles, or cells, exhibiting stages of progressive development; magnified 310 times.

A, corpuscles, showing the nuclear granules much enlarged by growth, but still contained in a cell membrane.

B, a further stage of growth of the corpuscles, the nuclear granules much enlarged, and the cell-membrane lost. See p. 19.

Fig. 7.—Favus-corpuscles, still further advanced in growth; magnified 310 times.

The corpuscles are now resolved into groups of nuclear granules, measuring $\frac{1}{4500}$ of an inch in diameter. At the left-hand side of the figure the groups retain somewhat of a circular form, while on the right they are gradually becoming elongated. See p. 19.

Fig. 8.—In this figure, the nuclear granules are seen gradually passing from the single and grouped forms

through the stages *A* and *B*, to the plant-like form represented at *C*. See p. 20.

The figure is magnified 310 times.

Fig. 9.—Diagrams representing some of the appearances of the favous formation during its growth. See p. 20.

a, a stem composed of five cells, showing their mode of growth.

b, a cell in which four nuclei are in progress of development; such a cell as this is the cause of the dichotomous division of the favous stem.

c, the appearance presented by the cellated divisions of some of the stems.

d, the appearance of the cellated stems when seen with an imperfect focus.

Fig. 10.—One of the hairs removed from the centre of a favous crust; magnified 155 times. See p. 24.

Fig. 11.—A diseased hair from a patch of Common Ringworm; magnified 155 times. See p. 60.

The external layer is removed at *a*; at *b* it still remains.

Fig. 12.—A group of nucleated granules from the outer surface of the fibrous portion of the preceding hair. They are magnified 310 times.

CHAPTER I.

FAVUS.

CRUSTED OR HONEYCOMB RINGWORM.

SYNONYMS: *Kerion*.—*Porriigo lupinosa*, Willan.—*Tinea lupinosa*.—*Tinea favosa*.—*Tinea maligna*.—*Teigne faveuse*, Alibert.—*Porrigophyta*, Gruby.

FAVUS is characterised by the presence of crusts, of a bright yellow colour, scarcely rising above the level of the skin, covered by epiderma, exactly circular in shape when distinct (*favus dispersus*), bounded by an outline representing numerous arcs of circles when confluent (*favus confertus*), depressed or slightly cupped on the surface, and pierced in the centre by the aperture of a hair follicle which gives passage to one or two hairs. To these the special characters of Favus

may be added, more or less redness surrounding each crust and cluster of crusts, a ragged and exfoliating state of the epiderma of the adjoining skin, a thinned and glazed appearance of those parts of the scalp on which the disease has exhausted its violence, and a loss of hair in irregular patches.

Favus is a disease of the scalp; but in some few instances, has been observed on other parts of the body.

In Britain, the disease is rare; and probably more so at the present day than some years back. In France, if we may judge by the manner in which it is spoken of by the writers on skin-diseases, the affection is far from being infrequent.

To return, however, to the specific characters of this disease:—The crusts of Favus are altogether unlike those of other cutaneous diseases. They are situated, *not upon*, but *under* the epiderma, and as a consequence of this peculiarity of position, they are smooth on the surface, and very little raised above the level of the skin. They are not the result of a desiccated morbid secretion poured out by a broken or ulcerated sur-

face,*—the disease, in fact, being unaccompanied by discharge of any kind,—but are formed of a peculiar substance, a remarkable and peculiar modification of cell-formation and growth.

The yellow colour† of the crusts of Favus is a striking feature of the disease; the yellow is much brighter than that of pus, and this character enables us to discover the first traces of its appearance around the apertures of the affected hair-follicles. At this early period, the yellow substance may be seen forming a yellow ring of equal dimensions around the margin of the hair-follicle; it is quite evident that it is separated from the hair by the epidermal lining of the follicle; indeed, the aperture of the follicle is free, and generally remains so throughout the

* Bateman is consequently wrong in speaking of the crusts as being formed “by the concretion of the fluid which exudes when they (the pustules) break.”

† From leaning with too much reliance on the older writers, Bateman has fallen into the mistake of calling the crusts “yellowish white” and “white.” The source of his error is the following quotation from the Arabian author, Haly-Abbas:—“Quinta est lupinosa, sicca, et colore albâ.”

entire growth of the crust, and no pressure exerted upon the skin can force through it the morbid formation.

The growth of the crust is eccentric, fresh matter being deposited in successive rings around that which was first formed, the breadth of the rings undergoing a gradual increase. This mode of growth is conspicuous on the surface of some of the crusts wherein the first formed rings have become altered in colour from desiccation, and their outlines may be distinguished as a series of reddish-brown and concentrically arranged lines. The alteration of colour here referred to being the effect of desiccation, the whole central part of the crust assumes more or less of a reddish-brown tint.

This mode of growth of the crusts also gives rise to another of its characters, namely, the depressed centre, which has gained for the disease the appellation of Favus (honeycomb). But it is ludicrous to compare the slightly depressed, and precisely circular, crusts of Favus with the deep hexagonal cells of the honeycomb; and we cannot but regret that the scientific denomination of

the disease is so little appropriate. The first formed rings of favous matter naturally shrink as the latter loses its fluid by desiccation, but the last formed ring, retaining its moisture, is brighter coloured and more prominent than the rest, and is the chief cause of the central depression of the crust. Occasionally the central part of the crust, namely, that which immediately surrounds the hair-follicle, forms a slight prominence, and destroys the exact concavity of its surface.

The crust at its outer margin gradually sinks to the level of the surrounding skin, and the epiderma passes from one to the other without change.

Such is a description of the crust when uninjured and entire, but in many instances, its surface, being dry and brittle, cracks in a circle round the hair, in consequence of the contraction of the favous matter during desiccation, and the component substance of the crust is more or less exposed to view. Occasionally, the central follicular piece of the crust becomes loosened from the rest, and either adheres to the hair or is drawn

upwards on its shaft, and has the appearance of being strung like a bead upon its thread. The exposed substance of the crust is lighter coloured (cream coloured) than its surface, and more or less broken into small masses, according to its degree of dryness. It is this latter character that Bateman alludes to when he says that the "central indentation or depression sometimes contains a white, scaly powder." It will be seen at once that Bateman is wrong in this expression, for the surface of the crust is gone before the disintegrated appearance alluded to comes into view, and then even it is not a "scaly powder." This remark of Bateman's is evidently the "a quâ quasi cortices et squamæ fluunt albæ" of Haly Abbas.

In its early development, the crust of Favus is exactly circular, and it maintains this form with remarkable accuracy even when neighbouring hairs are implicated in its progress, so that, it sometimes happens, the crust is transfixed by several hairs, one or two being central and representing the starting point of the morbid action, the

others being more or less peripheral. Occasionally two or three crusts approximate in their growth and become blended by their margins; and in the aggregated form of the disease (*favus confertus*), a number are thus united together. In the aggregated mass, however, the circular form and depressed centre of the originally separate crusts are still perceptible.

The size of the crusts is something less than a quarter of an inch in diameter, namely, between two and three lines. Bateman speaks of them as acquiring the size of a sixpence, which is incorrect.

SEAT OF THE DISEASE.

Passing now from the outward characteristics of this disease to the relation subsisting between the morbid formation and the skin, we find that if, with a little care, we break through the epiderma around the margin of the crust, we are enabled to raise up and remove the entire crust without drawing blood or injuring the skin. And if we perform this manipulation after the removal of an oiled-silk covering or poultice

which has been allowed to remain on the head for a few hours, we may succeed in peeling off the whole of the crusts without pain to the patient, and with the utmost facility, the crusts being unbroken and retaining their exact form. Moreover, in the course of withdrawal, the crusts will be unthreaded from the hairs, leaving the latter behind standing firmly in their follicles.

In this manner we are enabled to demonstrate that the under surface of the crust is smooth and convex, and of a honey-yellow colour, and that there is frequently a prominent papilla, corresponding with the aperture of the follicle of the hair, which projects from the centre of the convexity. The crust is thick throughout its entire extent, but thicker in the middle than at the periphery, and at its thickest part measures from one-half to one-third of a line.

On the surface of the derma there exists a depression corresponding with the dome-like convexity of the under part of the crust. This surface is smooth, shining, and red; and is evidently constituted by the base-

ment membrane, which is transparent, but somewhat thickened. In the centre of the depression is the aperture of the hair-tube unaffected by the morbid action; and if the hair be withdrawn, it is evident that it has no direct participation in the disease. The under surface of the compound crusts displays the numerous domes of the originally separate crusts, and the impression on the derma is that of a number of cups divided from each other by prominent partitions.

The structure of the derma has obviously suffered absorption, from the gradual and prolonged pressure which has been kept up on its surface. The derma has become very greatly thinned, all trace of papillæ is lost, and the hair follicles are considerably shortened. A further continuance of this pressure, occasioned by a further addition of favous matter to the under part of the crust, would entirely obliterate the hair-follicles, and then the formation of hair would cease. This is the explanation of the loss of hair which takes place in favous disease.

After the removal of the crusts, it is

curious to observe how quickly the compressed derma becomes lifted up. In the course of a few hours, the depressions are almost effaced, and a film of epiderma is formed upon their surface. But if the pressure have been great or of long duration, the normal level is never completely regained, and the skin frequently retains its thinned and atrophied character for the rest of life. The papillæ of the derma having been destroyed, the restored surface is unnaturally smooth and covered by a transparent and flaky epiderma, which is repeatedly thrown off by desquamation. The injured hair-follicles admit of no regeneration, and the diseased spots therefore remain permanently bald.

The colour of these altered patches of skin is that of a portion of integument which has long suffered under chronic inflammatory action; in relaxed constitutions, the veins are dilated, and the torpid circulation gives rise to a blueness and lividity of hue. In more healthy states of the system, the tint of colour is reduced below that of the surrounding surface, in consequence of

the diminished amount of the capillary rete of the skin.

According to the preceding observations, the precise seat of the morbid formation of Favus is the surface of the derma. The morbid substance lies in contact with the basement membrane of the derma on the one hand, and with the epiderma on the other. From the derma, as I have already shown, the favous substance is easily separable; but, with the epiderma, it is closely identified. Its relation to the epidermal lining of the follicle of the hair is similar to that of its connexion with the epiderma.

STRUCTURE OF THE FAVOUS CRUST.

When we proceed to the anatomical analysis of a crust of Favus, we find it to present some diversity of texture in different parts of its thickness. The upper surface, for example, being combined with the epiderma, evinces the laminated disposition of that membrane, and is brittle from its dryness. The deep surface is of a darker yellow than the rest, of a honey-yellow colour, as I have elsewhere remarked, and

conspicuous for its density and toughness; tearing with difficulty when dissevered by needles for microscopical examination. The middle portion, which constitutes the greater bulk of the crust, is cream-coloured,—becoming, however, as yellow as the deep surface when moistened—and broken up into small irregular masses, like mud which has been exposed to the sun to dry.

Under the microscope, these three divisions of the crust, namely, its deep, middle, and superficial portions, present differences of structure which I shall now proceed to describe.

The *deep* portion is composed of globular corpuscles, measuring $\frac{1}{5000}$ to $\frac{1}{3000}$ of an inch in diameter, closely collected together and forming the outward boundary of the crust. Each corpuscle is constructed of a cell-membrane enclosing numerous very minute secondary cells ($\frac{1}{10000}$ to $\frac{1}{6000}$ of an inch); and the latter are formed of several minute transparent granules ($\frac{1}{20000}$ to $\frac{1}{12000}$ of an inch). In the centre of each of the secondary cells is a dark point, which might be regarded as a nucleus, but which, in

reality, is merely the shade caused by the approximation of the elementary granules of which it is made up.

The *middle portion* of the crust is composed of corpuscles much larger than the preceding—namely, between $\frac{1}{2500}$ and $\frac{1}{1500}$ of an inch in diameter, and consisting of a cell-membrane, containing from four to seven or eight nucleated granules; of nucleated granules ($\frac{1}{4500}$ of an inch), separate and in groups; and of other nucleated granules connected together in a linear series, and assuming a branched and plant-like form.

The *superficial portion* is remarkable only for the large size of the nucleated granules and for the more highly developed condition of the plant-like growth. In it there are no corpuscular cells.

NATURE AND ANALOGIES OF THE FAVOUS CRUST.

In its essential nature, I believe the peculiar matter of Favus to be a modification of the elements of the epiderma. The grounds upon which I found this view I will now proceed to explain.

The epiderma, as I have pointed out in a Paper "on the Development and Growth" of that membrane, read before the Royal Society in 1845, and published in the second edition of my work on "Diseases of the Skin," is originally a plastic fluid, which goes through the successive forms of elementary or primitive granules, aggregated granules, nucleated granules, and cells, before it attains its ultimate condition of flattened scales. For the mode in which these changes are effected, I must refer my readers to the paper itself.

Now, the favous matter is necessarily in a fluid state when first effused through the capillary vessels on to the surface of the derma, and in its freshly elaborated condition consists of granules possessing a simple, aggregated, and nucleated shape, and cells. I have ascertained the presence of these elementary forms. The primitive granules measure from $\frac{1}{20000}$ to $\frac{1}{12000}$ of an inch in diameter; the nucleated granules measure $\frac{1}{4500}$; and the cells between $\frac{1}{5000}$ and $\frac{1}{3000}$.

The primitive granule is the first organic shape of the plastic fluid effused by the

blood, and the process by which that shape is assumed is a kind of vital coagulation or vital crystallization. It is endowed with an independent life, and is capable of acting both alone and in combination with similar granules. It separates from the plastic material by which it is surrounded the elements of growth, and attracting towards itself other granules, forms an aggregated granule; the aggregated granules performing similar actions, constitute nucleated granules; and several of the latter combining in a like manner and forming around themselves a peripheral boundary, constitute a cell. The growth of the cell is the result of the vital agency of the whole of the contained primitive granules. These granules draw nutritive material from the blood, which nutritive material serves the double purpose of contributing to their own growth and giving origin to new granules, so that the same changes occur within each cell as had taken place in the plastic fluid poured out on the surface of the derma.

Reasoning from analogy, the mode of development and growth of a cell must be

the same in whatever part of the body it is produced, and whatever special purpose it may have to perform; and microscopical investigation establishes the existence of an identity of structure among them. The blood-cell, the mucus-cell, the pus-cell, the pigment-cell, the epithelial or epidermal-cell, for example, resemble each other closely in construction, and in some instances appear to be convertible the one into the other. The cells or corpuscles of Favus possess a striking resemblance to pus-cells, and, excepting in their form, are closely allied to young epidermal cells; so that it would require no stretch of imagination to suppose the epidermal cell, altered in its actions by disease, capable of assuming the character of the pus-cell; or the latter, from a similar cause, passing into the likeness of a favus-cell.

In the early development of Favus, it is no uncommon thing to see around the aperture of a hair-follicle a circle of pus in place of favous matter. There is no difficulty in distinguishing between the two, for pus is much lighter coloured than the matter of

Favus, and when the epiderma is punctured, issues from its cavity in the form of a drop. In a very short time, however, this little collection of pus loses its characteristic colour; it becomes, as it were, dried up, is no longer recognisable as pus, and merges into the yellow crust of Favus. Now in this fact we have evidence that the same tissue may produce, one while, epidermal-cells; another while, pus-cells; and thirdly, favus-cells. Can we close our minds against the signification of so remarkable a phenomenon?

The fact of pus being so easily distinguishable from the matter of Favus may, at first sight, appear to offer a contradiction to the analogy which I am seeking to establish, but the difference between the two is more apparent than real. Pus is fluid, from the presence of a large quantity of water, and this dilution with water necessarily alters the colour and modifies the development of the corpuscles. Favous matter, at its softest, appears in the state of a paste.

A drop of pus from the situation referred to was composed of globular corpuscles

$\frac{1}{3000}$ of an inch in diameter floating in liquor puris. The corpuscles presented the ordinary granular appearance of pus; but when water was added, they swelled to the size of $\frac{1}{2000}$ of an inch; and, in place of the minutely granular structure which they previously had, displayed in their interior from four to seven or eight large granules or nuclei. I will not stop to inquire by what means this change was effected. Imbibition of water was evidently one of the phenomena, but what the process might have been by which the minute granules, or rather cells, which were previously seen, were dispersed, is a matter of no importance to the present investigation.

Now the corpuscles which form the deep layer of the crust of favus are composed of seven or eight granules, which represent the nuclei of the cell. The size of the granules varies between $\frac{1}{10000}$ and $\frac{1}{6000}$ of an inch, while that of the entire cell is $\frac{1}{3000}$. So that these cells correspond very accurately with the multinucleated pus-cells, the only difference between them being the disten-

sion of the cell-membrane of the pus-cells with water.

It is interesting to observe the development of these Favus-cells as they become displaced, by successive formations, from the surface of the basement membrane, and proceed onwards towards the centre of the crust. The nuclear granules gradually enlarge until they attain the $\frac{1}{4500}$ of an inch, a size nearly approaching the bulk of the original cell; and the cell in which they are contained measures between $\frac{1}{2500}$ and $\frac{1}{1800}$ of an inch. At this period, the function of the cell apparently ceases, for its membrane becomes broken and lost; many of the nuclei are dispersed, but many also remain adherent to each other, and may be observed in linear groups of two, three, and even four or five, already assuming a plant-like character.

In recapitulating the changes referred to in preceding paragraphs, it would appear that the vital force inherent in a plastic fluid is employed in the development of molecules of extreme minuteness,—primi-

tive granules; that these granules combine and co-operate for the formation of cells; and that the aim of the cells is the production of nuclei or secondary cells. We will now examine these secondary cells, and follow the subsequent changes which take place through their means.

It is quite evident that these secondary cells are themselves nucleated. In some instances, a single nucleus only is perceptible; in others, two; and in others again, three. When two nuclei are apparent, the secondary cell assumes an oval or oblong form; and when there are three, it has a three-cornered shape. As soon as the cell has attained an elongated form, a slight contraction is apparent around its middle, and a septum is thrown up which divides it into two cells; in a short space of time, each of these cells develops two nuclei, which at first separate, and are finally parted by a septum, as in the previous case; a third repetition of similar actions might convert the four into eight cells, and in this way an elongated stem is produced, which has all the appearance of a vegetable formation. When, in place of

two, three nuclei are developed at the same time, the stem has a dichotomous character, and seems to have resulted from the growth of two branches from one stem; and the occurrence of a trinucleated cell in the course of growth of a stem is the usual origin of a branch.

When the process of growth which is here described is accompanied by an active nutritive force on the part of the cells, the cellated stems maintain the original diameter of the cells from which they spring. But when the nutritive force is less active, or the growth is more energetic, then the stems dwindle in size in a corresponding ratio. This I apprehend is the signification of the considerable range of variety in breadth which these stems exhibit; the thicker ones measuring $\frac{1}{6000}$ to $\frac{1}{4500}$ of an inch, and the smaller $\frac{1}{15000}$. It certainly has no reference to trunks or branches, as the idea of a vegetable growth might suggest.

The thickest and largest cellated stems are found in the upper portion of the favous crust, the most slender in its deeper portion; while in the middle portion, stems of

every intermediate size are found mingled with secondary cells in vast numbers. These, namely, the stems and secondary cells, together with the primary cells and primitive granules, being the real constituents of the crust.

The stems offer some slight differences in relation to the contents of their cells; in some, and especially in the large ones, the contents are transparent and the nuclei manifest, while in the smaller stems, they are finely granular.

The resemblance which the cellated stems of Favus bear to some of the inferior vegetable organisms, and especially to the mucidines, has caused them to be considered as plants. They have been described as originating in the cortex of the crust and growing inwards to the centre, as giving off numberless branches, and producing seeds or sporules in vast abundance; the so-called sporules being the secondary cells of the previous description. With all these plant-like characters, hypothesis speedily reached the conclusion that the sporules must be the means of disseminating the disease; in other

words, were the elements of contagion. Now, I think, that any one who has followed with attention the argument contained in the preceding history, will agree with me that mere resemblance to a vegetable formation is not sufficient to constitute a plant. The statement of the origin of the vegetable formations by roots implanted in the cortex of the crust is unfounded, the secondary cells bear no analogy to sporules or seeds, and it is somewhat unreasonable to assign to an organism so simple as a cell the production of seeds and reproduction thereby, when each cell is endowed with a separate life and separate power of reproduction.

Again, it has heretofore been assumed that the favous matter was contained in the hair-follicles, and consequently communicated with the exterior; an assumption which rendered the idea of a plant-like formation the more probable. But if, as I have shown, the favous matter is sub-epidermal, and has no communication with the exterior, it will be necessary to admit the production of a vegetable organization within the animal tissues before such a phenomenon can be

received as possible. The mucedinous formations which have been described hitherto as having been discovered in the animal body, have always been found on the surface of membranes, and not in the substance of tissues, as is the case with Favus.

In chemical composition, the crusts of Favus, according to the analysis of Thenard and Chevillot, consist of—

Albumen	70	parts.
Gelatine	17	„
Phosphate of lime	5	„
Water	3	„
Loss	5	„
	<hr/>	
	100	

STATE OF THE HAIR IN FAVUS.

In a preceding paragraph I have stated that the hair remains standing in its follicle when a recent crust is removed, and, I may add, that if it be drawn out, it will be found unaltered in appearance. It is only when the favous matter has increased to the extent of obliterating the follicle that the hair falls. If the obliteration of the follicle be complete, no new hair is formed, but if it be

only partially destroyed, then a hair may be produced of smaller diameter than the original hair, or somewhat lighter in colour. It is unreasonable to expect that so serious a disturbance of cell-formation, as that which occurs in Favus, can exist in the scalp, without interfering in some manner with the structure of the hair, itself a product of cell-formation. Such an interference does really take place, and the nature of the morbid alteration I shall now proceed to explain.

When a hair from the midst of a crust of Favus is placed under the microscope, it is seen to be traversed in the direction of its length by a number of cylindrical tubes measuring in diameter $\frac{1}{10000}$ of an inch. A close examination shows that these tubes are divided by transverse septa into small spaces a very little longer than their breadth, and are filled with air. Now, an observer imbued with the vegetable theory of Favus would be likely to conclude that these were the stems of a mucedinous plant, and so indeed they have been considered. They have also been described as branching dichoto-

mously, an assumption altogether unfounded in fact.

To understand the true nature of these tubes, it is necessary to go back to the structure of the hair—a structure which was first thoroughly investigated by myself, and concerning which I have published* the following observations:—“ The middle or fibrous layer of the hair is composed of oval shaped cells, closely packed together, and arranged in a linear order. These cells are identical in structure with the cells of the deep stratum of the epiderma—that is to say, they are composed of granules congregated around a central granule, which constitutes the nucleus of the cell. When examined with the microscope, it is not in all cases easy to discover the cells, but their component granules are always obvious, and from the plan of disposition of the cells and their oblong shape, the granules have a linear arrangement, and assume the appearance of fibres. The hair-fibres offer some variety of appearance according to the focus in which they

* On Diseases of the Skin. Second edit. p. 24.

are viewed. For example, with a superficial focus, the peripheral granules are alone seen, and the hair appears to be entirely composed of granules arranged in single rows. With a deeper focus, the rows of granules appear to be associated in pairs, each pair having between them an unconnected row of dark and apparently nuclear granules. In this view, the fibres resemble very closely a chain composed of open links. While, with a still deeper focus, the centre of the cell, with its nucleus and granular periphery, is brought into view."

Now the hair-fibres here described are composed of cells arranged in a linear series, and the cells are filled with a homogeneous albuminous substance, having a certain consistency, and possessing the characters of a solid. Under the influence of disease, the contents of the cells are so far modified as to be deposited in a fluid form, and the subsequent evaporation of the fluid, during the growth of the hair, leaves the fibres hollow and empty, and to all appearance tubular. This is the explanation of the hollow tubuli which are found in the structure of the hairs

in favous disease; generally they are distributed in small numbers throughout the thickness of the hair, and produce no influence on its shaft; when more numerous they occasion the lightness of colour of the hairs before mentioned and their somewhat shrivelled appearance. But it is evident that they offer no analogy with the plant-like formation of the crusts of Favus. When the hairs present the tubular structure to any great extent, they become brittle, and are easily broken.

SYMPTOMS OF FAVUS.

The early part of the course of this disease is attended by a moderate amount of itching. At a later period, when the crusts have enlarged, and are producing pressure on the inflamed skin, the scalp is tender and painful, particularly in resting the head on the pillow at night. When the disease is sadly neglected the pressure of the crusts, together with scratching with the nails, may give rise to ulceration, and, according to the French writers, these ulcerations have been seen extending even to the bones of the cranium.

The dried crusts give out a peculiar odour, like that of mice; and when the skin falls into a state of ulceration the discharge is said to be most offensive (compared by Albert to the urine of cats), and pediculi are apt to be engendered in numbers.

When the state of irritation and inflammation of the scalp are great, the occipital and cervical lymphatic glands are apt to become painful and enlarged. This is a common circumstance in inflammation of the scalp, and one that I have had frequent occasion to observe even in cases of inflammation artificially excited. I make this remark because some dermatologists would lead us to infer that enlargement of the lymphatic glands of the neck was pathognomonic of Favus. In the most severe and neglected cases of Favus, the inflammation of the lymphatic glands has gone on to suppuration and ulceration.

CAUSE OF FAVUS.

Favus is a disease of deranged nutrition, and generally occurs in childhood, at a period of life when the nutritive functions are most

active, and when, as a consequence, they are most susceptible of disturbance. At this age, any circumstance which may tend to reduce the powers of the system may become a pre-disposing cause of favous disease. Favus is generally met with among the children of the poor, and in those institutions for the children of a better class, that are so mismanaged in respect of diet, clothing, ventilation, and cleanliness, as to engender a disposition to disease.

The more frequent occurrence of Favus in France than in England is, I believe, attributable to the greater poverty and wretchedness of the lower classes in the former country, added to a practice which is happily almost unknown in England—namely, the putting out of the children to nurse. The remark has been handed down, from author to author, that children afflicted with Favus remain stunted in their growth, are slow in displaying the changes which take place at puberty, and are wanting in their intellect. “I have seen,” says Biett, “individuals affected with this disease evince no signs of puberty at the age of twenty, and even more.”

In my opinion, these phenomena of retarded development are not the effect, but a part of the general deficiency of power—in other words, of the defective nutrition which is the real cause of the disease.

IS FAVUS CONTAGIOUS?

The transmitted records of the older writers and modern authors both agree in according to Favus a high degree of contagious power. The supporters of the vegetable theory of the disease are still more ardent in this belief; for, with a distinct mucedinous growth and a host of sporules, it would be hard indeed if the disease were not susceptible of propagation. This theory will also win admirers and disciples from the simple and truth-like explanation which it seems to offer of the manner of transmission.

The seeds are conveyed directly to the soil in which they take root and grow; they are carried by combs, or brushes, or hands, or they are wafted by the winds. Gruby made the contagious property of Favus the subject of experiments; he inoculated with

the substance of the favous crust mammiferous animals, birds, reptiles, insects, and himself, but without any success. He also inoculated vegetables with the same matter, and, after seventy-six trials, he found a myco-dermis similar to that of Favus produced on a cryptogamic plant.

I am exceedingly doubtful of all that has been recorded with regard to the contagiousness of Favus. The experiments of Dr. Gruby prove nothing in its favour, for the instance to which he refers is merely one of the formation of a mucedinous plant, in other words, of a crop of mould, upon a wounded cryptogamic plant. The identity of this mucedo, with the "porrigophyte," or plant of Favus, being far from being established.

The seat of development of Favus affords a common-sense negative to the notion of propagation by seeds or sporules; and if it be true, as I have endeavoured to prove, that the plant-like production has nothing in common with plants but its form—a form which is as constant in animal structures as in plants—the vegetable theory of the disease must necessarily fall to the ground.

I will now adduce a different line of argument. In the course of my long connexion with the St. Pancras Infirmary, I have seen not more than six cases of Favus: in no one instance was there reason to suspect the disease to have originated in contagion, and certainly there was no example of its transmission to others. In a well marked illustration of this disorder, the features of which I have preserved by delineation,* the patient, a boy, ten years of age, had suffered from Favus for seven years. He was brought up with a brother and sister; and, on the last occasion of the outbreak of the disorder, was one of a school of one hundred and fifty-eight boys. He remained in the school until the disease was fairly developed over the greater part of his head, and was then transferred to the Infirmary, where he was accustomed to play with several invalid companions. Now, during the whole course of his association with other children, although he partook of their games without restraint, although he washed in the same water, and

* Portraits of Diseases of the Skin. Fasciculus I.

used the same towel and comb, the disease was never communicated to others—it never extended beyond himself.

Bateman, who was an ultra-contagionist, and gave the specific title of “contagiosum” to a very harmless form of disease of the sebiparous glands—namely, the “small sebaceous tumours” of my classification, opens his history of diseases of the scalp by the observation that “the porrigo is a contagious disease.” This sweeping condemnation is immediately followed by an exception in favour of *porrigo larvalis*; to which might have been added, without any hesitation, *porrigo favosa* and *porrigo decalvans*; so that, on the threshold of inquiry into the contagiousness of porrigo, one half the species of that writer might have been declared at once to be free from imputation. The remaining three species, or, as I have shown, two, for *porrigo furfurans* and *porrigo scutulata* are stages of the same disease, are, therefore, the only affections about which any doubt can exist in the minds of persons conversant with cutaneous diseases.

The impression made on my mind by the

perusal of the account of Favus (porrigo lupinosa) which is given by Bateman is, that he cannot have been familiar with the disease, and that his description is not drawn from nature, but composed from the writings of the older medical authors, who, in this instance, had certainly observed the disorder very imperfectly. The term "porrigo" he tells us was adopted by Willan "nearly in the same sense in which it was used by Celsus, who included the moist and ulcerating, as well as the dry and furfuraceous, eruptions of the scalp under this denomination." He further observes, that "numerous writers, ancient and modern, have designated the varieties of the disease (porrigo) by distinct names, such as crusta lactea, alopecia, pityriasis, favi, achores, scabies capitis, &c.; but the most intelligent observers have pointed out the identity of the nature and causes of these eruptions;" from which it may be inferred that the "ancient and modern writers" were greatly superior, in point of discrimination, to the "most intelligent observers;" for, of a surety, nothing can be more widely dissimilar or non-iden-

tical than the diseases represented by the six designations mentioned above. In the absence, therefore, of facts, and something in the shape of proof to the contrary, I must be permitted to doubt not only the contagion of Favus, but also the qualification of Bateman to speak to the subject. It is further worthy of remark that in the plates of cutaneous diseases published by Willan and Bateman, there is not one which represents Favus.

Plumbe commences his treatise on porrigo by adverting to "its known infectious nature." He alludes to Favus only as the crusted stage of common ringworm, and that so lightly that it is evident that he cannot have observed the disease with attention. On its contagious property he is obviously no authority.

I have elsewhere observed that Favus is a disease which is rare in this country, but common in France. "Next to eczema and impetigo," says Rayer, "Favus is the most common of the chronic inflammations of the hairy scalp." Again, he observes, "Favus is a contagious disease, and is readily com-

municated among children who make use of the same comb and brush, especially if any slight excoriation happen to exist on the scalp. He, furthermore, adduces the evidence of Willan, in proof of the contagious qualities of the disease, and concludes with the erroneous observation that "the complaint is very common in England."

Biett records that Favus is "evidently contagious, but in some cases the attempt to produce infection has entirely failed." Gilbert observes, that the "contagiousness of Favus is acknowledged by almost all pathologists:" he then unfortunately adduces the evidence of Bateman, and, after making mention of some instances which prove too much, he finishes up with the following remark:—"The contagiousness of Favus is then an established fact." In fairness to him I will now quote his illustrations, however little weight they may have with myself. "In the wards of Biett, two or three instances have been seen of the propagation of this disease by the act of kissing, the disorder making its appearance in these cases around the mouth and on the chin.

In a patient who wore a wig which had belonged to a person affected with Favus, the latter disease broke out on the arms and legs. This curious circumstance was explained when it was ascertained that the wig always came off during the man's sleep, and was found in the bed in contact either with his arms or legs. Some years since, M. Guersent had occasion to see, in a school, twelve children who were successively attacked with Favus within the space of a few weeks or months, in consequence of the admission of a child affected with that disorder."

There is too much of a blind and unthinking deference to the statements of predecessors in all these examples. In some instances, I make no doubt, that the case was not Favus at all; and in others, communication by contact has been admitted with too little consideration. The breaking out of a disease in a number of children breathing the same air, partaking of the same food, and living under the same hygienic influences, is a circumstance of daily occurrence, and one totally distinct from contagion; and

if, as I have shown, a free association continued for years between an affected individual and others has failed in transmitting the disease, the power of transmission may be reasonably doubted. It is refreshing to find an original thinker like Alibert refusing his assent to the current belief in the contagiousness of Favus.

Finally, whether we regard Favus in its origin, in its development, or in its essential nature, or whether we look at its phenomena in a social point of view, its extreme rarity, and the indisposition to transmission which it evinces when closely observed; in each and every of these features of the disease, we shall find reasonable grounds for doubting its propagation by contagion. My own careful investigations of the subject have forced on my mind the conclusion, that *Favus is not contagious.*

TREATMENT OF FAVUS.

The indications for the treatment of this disease are two in number, the first being—
To restore the defective powers of the constitution;

the second—

To restore the local power of the skin.

The fulfilment of the first indication calls for—

Improved hygienic conditions,

Improved diet,

Tonic-alterative medicines;

that of the second requires the aid of local remedies belonging to the class of—

Abluents,

Stimulants.

The four great hygienic principles—namely, air, exercise, clothing, and ablution, deserve the first and especial attention in this disease. Favus is usually engendered in the confined and malarious homes of squalid misery, and the most opposite conditions to these should be selected in our treatment; the patients should be sent to a spot located on a dry soil, breathed upon on all sides by a bracing, healthy air, uncontaminated by the steams and impurities which rise from the congregated abodes of human beings. The apartment in which he sleeps should be thoroughly ventilated; it should be large and lofty; he should lie in a separate bed,

and the number of persons sleeping in the same room should be as few as possible. Let no man be rash enough to say that, because *all* this is impracticable, it should, therefore, be wholly unattempted ; there is a devil going about the world who often whispers such an argument into the ears of his dupes. If thou hast not all, give half ; if not half, give a fraction ; but sink not back into sloth, and do nothing.

The subjects of this disease are for the most part children, therefore exercise is a paramount necessity. The physical, and not least important, education of children consists in eating, drinking, sleeping, moving, building up a healthy structure, and furnishing that structure with a sound constitution and sound mind. If the physical phenomena of life are well and truly performed, Nature will have no time for pathological experiments on her subjects.

The clothing of children suffering under this disease should be carefully adapted to their own feelings and to the temperature of the season. It should be kept strictly clean, and frequently changed. Ablution is another

important consideration. The sponge bath should be used daily. Local ablution is of little value in comparison with general sponging. I have, however, discussed the principles of hygiene so fully elsewhere,* that it would be needless to dwell upon the subject here.

Attention to the diet of persons suffering under Favus is of the utmost importance. As a general rule, it should be animal and nutritious, and only moderately fluid. Much vegetable food should be avoided, and all matters which obviously disagree with the stomach. The best directed medical treatment can do but little when the diet is based on a meagre standard.

The medicine which, above all others, is best adapted for crusted ringworm, is *iron*. The formula is not very material. I have used the citrate, acetate, and sesquichloride; and the latter I prefer. The dose which I prescribe for a child of ten years is ten drops of the *tinctura ferri sesquichloridi* on sugar, three times in the day. The iodide of iron is

* On the Management of the Skin, as a means of Promoting and Preserving Health. Second Edition.

also an useful remedy. When the powers of the system are much enfeebled, the citrate of iron and quinine is an excellent remedy, well adapted for children from being compounded in the form of a syrup. Where iron produces heat and dryness of the mucous membranes with feverishness, I use the nitro-muriatic acid, either as a sherbet, or combined with tincture of cinchona or gentian.

If there be any tendency to strumous enlargement of the lymphatic or mesenteric glands, I should recommend the oleum jecoris aselli; and if any tendency to slenderness and flexure of bones, lime water. It is hardly necessary to observe, that the ordinary functions of the body should be watched and regulated by the usual means; but, as a general rule, aperients and purgatives are injurious, and should be avoided.

To restore the local powers of the skin, it is necessary to have recourse to local remedies. In the first place, the crusts must be removed, a manœuvre which is easily accomplished, by impregnating the scalp thoroughly with oil, at bed-time, and washing it

in the morning with water and soap. A few repetitions of this process will suffice to clear away the crusts effectually. The same end may be attained by means of a linen compress moistened with a weak solution of subcarbonate of potass, and an oiled silk cap worn for two or three nights; or by a poultice. I am not favourable to the practice of frequent ablution with soap. When the crusts are once removed, a saponaceous ablution is not again required until they re-collect; nor do I approve of shaving the head; the only ground for this practice being cleanliness.

I now come to the means to be adopted to alter and suspend the abnormal actions taking place in the skin, while nature restores by degrees its wonted functions. The agents for effecting this purpose are local stimulants, and the best of these the *Ceratum Tiglii*, containing from ten to thirty drops of the oil to the ounce; the *unguentum hydrargyri nitratis*, diluted one-half; the *unguentum hydrargyri nitrico-oxydi*, diluted in similar proportion; the compound sulphur ointment, or the sulphuret

of potash lotion (3j ad Oj), with ceratum camphoræ, half a drachm to the ounce. In chronic cases, where the above remedies may have failed, they might be used in a more concentrated form. I am less favourable to strong applications now than when I began the treatment of cutaneous diseases; but in some instances I have derived benefit from tincture of iodine, and a spirituous solution of bichloride of mercury. Devergie recommends touching the crusts with a solution of nitrate of mercury in nitric acid. Creosote and tar I never use, on account of their powerful odour; and in this disease they possess no especial virtue. The iodide of sulphur I have found to exhibit no superiority over simpler remedies.

An unfounded notion has long prevailed among writers on cutaneous disorders, that the hairs in this disease act as a source of irritation. Some have considered the roots of the hairs to be the seat of origin of the morbid action, and the loosening of the hairs is an idea that has been commonly entertained. Plumbe was a warm advocate for the removal of all loosened hairs by

means of the forceps. Rayer observes, "In old standing cases of Favus of the scalp, 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." "The oldest system of this kind consisted in tearing out the hair violently by means of some adhesive plaster, which was applied or spread over the scalp. To prepare this plaster, it was customary to mix four ounces of rye-flour in a pint of cold white-wine vinegar; the mixture was set upon the fire and stirred continually, whilst half an ounce of the deuto-carbonate of copper (verdigrise) in powder was added; it was boiled for an hour, after which four ounces of black pitch, the same quantity of resin, and six ounces of Burgundy pitch were added. When all these ingredients were melted and incorporated, six ounces of antimonial ethiops (an alloy of mercury and antimony obtained by long trituration) in fine powder, were thrown into the mixture, which was stirred till it had acquired what was held to be a proper consistency. The plaster thus pre-

pared was spread upon a stoutish black cloth, which was slit in different directions before being applied, to prevent it from forming any crease, and to admit of its being subsequently removed in stripes.

“ The plaster was applied to the head, after having got rid of the incrustations, by softening them with cataplasms, and having clipped off the hair as close to the skin as it could be done with scissors. 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." As a commentary on this barbarous proceeding, the Messrs. Mahon affirm, "that they saw a child die two days after having had this horrible operation performed on its scalp."

The Messrs. Mahon pursue a different process for withdrawing the hair in this disease. They cut it to the length of two inches, apply poultices to soften, and thorough washing with soap to remove the crusts, and then comb the hair repeatedly, in order to draw out all the loosened hairs. After this preparatory process is accomplished, they rub daily into the scalp, for about a fortnight, a moderately stimulating application, consisting chiefly of lime and subcarbonate of potash,* in the form of

* According to an analysis made by M. Chevallier, the remedies of the MM. Mahon are composed of slaked lime, subcarbonate of potash, and charcoal. They use three applications of different degrees of strength, and once a week they sprinkle a depilatory powder among the hair, which they subsequently comb out.

ointment, and continue washing and combing as before. For the next three or four weeks, and until the cure is established, this treatment is pursued with longer intervals, no day being permitted to pass over without a thorough ablution.

It is obvious that this treatment of the Messrs. Mahon, which has proved the most successful ever pursued, does no more than fulfil the local indications laid down at the commencement of the principles of treatment developed in this chapter. These gentlemen call their ointment "depilatory," but in this they fall into the popular error of regarding the hairs, which are really harmless, as irritants. Their system is simply a moderately stimulating plan, wanting, to give it perfection, the constitutional treatment above recommended.

M. Petel has proposed, as an imitation of MM. Mahon's remedies, an ointment and powder as follows:—

℞ Sodæ subcarb. gr. ix.	
Calcis vivi ʒj.	
Axungiæ ʒij.	M.
℞ Calcis vivi ʒij.	
Carbonis ligni ʒij.	M.

D

50 FAVUS, OR HONEYCOMB RINGWORM.

The ointment is to be used daily after washing, and after the removal of the crusts; and the powder is to be sprinkled on the scalp with the view of causing the fall of the hair.

CHAPTER II.

TRICHONOSIS* FURFURACEA.

COMMON, OR SCURFY RINGWORM.

SYNONYMS: *Tinea capitis*. — *Tinea nummularis*. — *Porrigo furfurans*; *Porrigo scutulata*; Willan. — *Porrigo circinnata*; Good. — *Porrigo tonsoria*; *Pityriasis decalvans*; Gibert. — *Squarra tondens*; *Tinea tondens*; Mahon. — *Herpes tonsurans*; Cazenave. — *Alopecia porriginosa*; Sauvages. — *Phyto-alopecia*; Gruby. — *Trichophyton tonsurans*; *Trichomyces tonsurans*; Malmsten.

COMMON ringworm of the scalp is characterised by a dry and furfuraceous state of the skin occurring in circular or oval patches of variable size. The patches are slightly

* Der. θριξ, capillus; νοσος, morbus.

elevated, papillated,* and spangled, or, as it were, dusted over with minute epidermal scales. The hairs growing on the patches are whitish, twisted or bent, shrivelled and brittle, in some instances broken off near the skin, in others matted into conical prostrate bundles, or when augmented in thickness by an accumulation of scurf, condensed into thin yellowish-grey and fissured crusts. When heads affected with this disease are kept clean, the patches look parched, and the hair covering them withered and dried up. At a later period, the patches are left more or less bald, but never completely so as in Alopecia area.

In the early attack of Common Ringworm, the only appearance of disorder that can be detected is the formation of a thin layer of scurf, either in separate scales around single hairs, or in patches, including several, or a more considerable number. This formation is accompanied by a slight degree of itching, which is relieved as soon as the scurf is torn away by the nails or removed by the

* The MM. Mahon have compared this appearance to the skin of a plucked fowl; the papillæ they term *asperities*.

aid of the comb. At a later period, the skin upon which the furfuraceous scales are dusted appears reddish and slightly raised; the papillæ next make their appearance on the reddened patches, and subsequently the peculiar alteration of the hair.

When the disease is recent, the papillæ are very conspicuous; they are small and pyramidal, and resemble very closely the papillæ of *cutis anserina* thickly grouped together: they are, in fact, the mouths of the hair-follicles swollen and prominent from congestion, and have the appearance of being drawn up by the growth of the hair. The papillæ are inclined obliquely in the direction of the hair, are somewhat imbricated, and from the summit of each there issue one or two hairs surrounded by a whitish film, formed by the accreted sebaceous contents of the follicle. In older patches, the papillæ are less evident.

The hairs in this disease have been compared, not unaptly, to "tow." They are remarkable for their bent and twisted shape, and resemble the fibres of hemp in colour as well as in apparent texture; they are irregular in thickness, and are broken off at

variable distances from the scalp, giving rise to the moth-eaten appearance from which Common Ringworm derives its synonym, *tinea*. In dark-haired children, the stumps of the broken hairs frequently present little black knobs at the mouths of the follicles.

The crusts which form over the morbid patches when the disease is neglected, are composed of furfuraceous scales and diseased hairs, agglutinated together by the moisture which rises from the skin; they are greyish and yellowish in colour, and when of large size, are apt to break up, in consequence of the movements of the integument, into several angular compartments, the line of rupture being remarkable for its white and silvery appearance. Moreover, on the surface of the crust, which is dry and harsh, the tow-like fibres of the diseased hairs may generally be perceived.

The porrigo furfurans of Willan and Bateman is a medley of diseases mingled together in a single description; one while the symptoms seem referrible to Eczema, another while they verge into Pityriasis or Psoriasis, and only belong to ringworm when the state of

the hair is spoken of as partially fallen off, thin and less strong in its texture, and sometimes lighter in its colour than natural. The remark that the disease "occurs principally in adults, especially in females," carries the mind to those disorders of the sebiparous glands and hair-follicles in which the desiccated sebaceous substance collects about the roots of the hairs, and the latter fall off. We must therefore dismiss *porrigo furfurans* altogether from consideration.

The description given by Willan and Bateman of *porrigo scutulata*, saving the pustules, which are a complication presently to be referred to, evidently applies to Common Ringworm. The character which principally occupied the attention of these authors in portraying the disease, was the "distinct and even distant patches of an irregularly circular figure," and this character formed the basis of their specific designation. Indeed, the term "*scutulata*" in reference to them is not inapplicable, for the rounded and well-defined patches, studded over with prominent papillæ, are by no means unlike the *scuta* with which they are compared.

In the early part of its course, Common Ringworm is wholly unattended with discharge of any kind, and sometimes this absence of secretion is conspicuous throughout its entire existence. At other times, however, and especially when neglected, the crusts give rise to considerable itching, and the attempts made to relieve this annoyance aggravate the inflammation of the skin, and occasion discharges of ichor and pus. Occasionally, as a complication of disease dependent on increased inflammation, pus forms around the apertures of the follicles, and a crop of small pustules is the result. Willan mistook these pustules for the primary form of the disease, and for that reason placed it in his group of "Pustulæ." The pustules when they exist are generally observed in the most active part of the patches, namely, along their edge, and in this situation I have sometimes seen them forming a double or a triple row.

Common Ringworm is attended by considerable itching of the skin, and the irritation and inflammation excited by scratching are apt to give rise to enlargement of the

occipital and cervical lymphatic glands. These symptoms subside when the cutaneous inflammation is relieved.

In England, the Ringworm here described is one of the most frequent of the diseases affecting the scalp. In France, according to Rayer, the disorder is "extremely rare; I have only," he remarks, "seen a single case of it in a child."

RINGWORM OF THE BODY.

Common Ringworm, when it attacks the head, is frequently seen also on the neck, the arms, and other parts of the body. The patches of the disease in these situations are circular in shape; they have a reddish ground dusted over with extremely fine, white, furfuraceous scales; are slightly elevated and papulated at the margin, but uniform with the surrounding skin in the centre. Sometimes the elevation of the margin is absent; and then, if the powdery scales are collected on the surface in great numbers, the patches look whiter than the adjoining skin. In children having a brown

hue of the skin, the white appearance of the patches is not uncommon.

The differences which Common Ringworm presents when viewed on the head and body at the same time, are easily explained, when we remember the dissimilarity of organization of the two regions; the highly developed condition of the hair-follicles and hair of the one, and the smaller dimensions of those structures in the other. The Ringworm of the body seems to have but little hold upon the skin, in comparison with that of the scalp, and runs along it with great rapidity. The patches spread by their margin, while their area returns to its healthy state; and the rings (*tinea annularis*) resulting from this mode of increase, are frequently of considerable dimensions. Sometimes the prominent margin of one ring remains, while the disease propagated from its periphery throws up a second ring; and on one occasion I saw a third ring formed in this manner. I have also seen a similar appearance on the scalp.

I have occasionally observed this form of Ringworm on the neck or arms of adult

females who have tended children suffering from *Trichonosis furfuracea*; but as frequently on others, who have had no such association.

PATHOLOGY OF COMMON RINGWORM.

The seat of disease in Common Ringworm is the hair and the epidermal lining of the hair-follicles.

When examined with the microscope, the dry, discoloured, and friable hairs of this disease are found to be more than twice their natural size, and a great change is perceptible in their structure. The average diameter of human hair, as ascertained by a measurement of two thousand hairs from the heads of different persons, is $\frac{1}{400}$ of an inch; while a number of hairs growing from the morbid patches of common ringworm measured between $\frac{1}{240}$ and $\frac{1}{150}$ of an inch.

A healthy hair is composed of three portions—a cortical portion, which forms the surface; a fibrous portion, which constitutes the chief bulk of the hair; and a central medullary portion or pith. Now in the

diseased hair, the cortical portion is little altered from its normal condition, but it is apt, in consequence of the morbid state of the layer immediately beneath, to crack and peel off, and so produce a roughness of the shaft. The medullary portion is apparently unaffected; the chief pathological changes being found in the fibrous portion, and particularly in its external part.

The fibrous portion of the diseased hair appears, from the great difference of structure which it presents, to be composed of two layers—an outer layer of various thickness, made up of colourless nucleated granules, and occupying about one-third the diameter of the shaft; and an inner layer, which retains more or less of the normal fibrous structure.

The external layer of the fibrous portion of the diseased hair is entirely formed of transparent, globular, nucleated granules, closely packed together, and constituting a tessellated structure. The size of the granules is about $\frac{1}{5000}$ of an inch, and they are somewhat flattened from mutual pressure. The cohesion subsisting between the gra-

nules is slight, for when the cortical layer of the hair is torn and peeled off, some of the granules remain attached to it, and others are dislocated from their natural position.

The internal layer of the fibrous portion, at the same time that it retains its fibrous character, is evidently altered in its texture; the fibres are thicker than natural, they are undulated in arrangement, and they appear to have entering into their construction, from point to point, one or two, and even long rows of the nucleated granules. The undulated and swollen character of the fibres gives to the entire shaft an appearance of laxity and rottenness of texture, upon which the friability of the hair obviously depends. When a hair is broken across, the fibres give way at unequal lengths, and the ruptured ends look uneven and ragged.

The epidermal lining of the hair-follicles has the same granulated structure as the external layer of the fibrous portion of the hair.

NATURE AND ANALOGIES OF THE DISEASE.

In its essential nature, the morbid alteration above described is a modification of the normal structure of the hair and epidermal lining of the hair-follicles. In a preceding page (26), I have shown that the hair-fibres which enter into the construction of the great bulk of the hair are composed of cells, and that these latter are made up of granules. Now, if from any cause the granules of the hair-cells should undergo enlargement or hypertrophy, the state of the hairs will be precisely that of Common Ringworm; and if the destruction of the natural tissue of the hair be considered, it may be described as a *granular degeneration* of the hair.

The mode in which these nucleated granules are formed appears to be identical with that of the production of the analogous granules of Favus. On the dermal surface of the epidermal lining of the diseased follicles I discovered corpuscles perfectly resembling favus-corpuscles, and I make no doubt that these corpuscles undergo the

same changes of growth and development as I have previously described in connexion with the formation of favous matter. There is, however, this difference between the two affections—namely, that in Common Ringworm the cell-development ceases with the production of nucleated granules; whereas in Favus, it is driven on another stage—namely, to the formation of cellated and plant-like stems. It is surprising, under these circumstances, that Favus is so rare in comparison with Ringworm, and that the latter does not occasionally assume the characters of the former.

Gruby, who has made the granules of Common Ringworm the subject of examination, as well as the abnormal cell-tissues of Favus, regards them in the light of vegetable formations, and places them in the same category of parasitic mucedinous plants, under the name of *Microsporum Audouini*. The granules are, of course, sporules; but where the parent plant is that produces them I am unable to tell.* Dr.

* I regret not having had leisure to follow up Gruby's researches more attentively; but, on the occa-

Malmsten,* of Stockholm, seems to adopt† the views of Gruby; he gives the disease a new name (*Trichophyton tonsurans*), and illustrates his paper with an engraving of the appearance of one of the morbid hairs when seen with the microscope.

For myself, I am as little inclined to yield the point in this disease as in *Favus*; on the contrary, the absence of the cellated shafts is an additional ground of argument against the vegetable theory. It is perfectly consistent with the pathology of abnormal nutrition, that the hair-granules should become enlarged, and thus be the cause of the subsequent changes taking place in the hair. But the hypothesis of vegetable growth within the substance of the hair, I find it difficult to comprehend.

sion of writing this treatise, it is perhaps better that I should be unbiassed by a more complete knowledge of his views.

* *Trichophyton Tonsurans*, Harskarande mogel. Stockholm, 1845.

† I am obliged to speak hesitatingly on this point, for although I have Dr. Malmsten's paper before me, I am not sufficiently master of the Swedish language to make out his opinion.

CAUSE OF RINGWORM.

Common Ringworm, like Favus, is a disease of deranged nutrition, its cause being debility of the organization, originating, probably, in defective innervation. In popular language, the disease may be said to depend on "poorness of blood;" and this expression conveys much in reference to the system of living which should be adopted for its cure. It must not, however, be supposed that "living" applies only to food; the other hygienic conditions of air, exercise, ablution, and clothing, are equally necessary to constitute a healthful regimen.

As an illustration of the influence of hygienic conditions in the production of Ringworm, I may quote some remarks by Dr. Wilkinson,* which were intended for a very different purpose. "Two families of fine children were brought to me from the country and put under my care, who had been for nearly two years affected with Porigo; these cases yielded, like others, to the

* Remarks on Cutaneous Diseases. By J. H. Wilkinson, 1822.

remedies employed, and in the course of two months seemed entirely subdued. One family remained in London three weeks after the disappearance of all complaint, yet, soon after their return to the country, it reappeared, and became in a short time as bad as ever."

The affection is met with only in children, or, if it occur at all in adults, it is extremely rare. Unlike Favus, it is not restricted to the lower classes, but is found in every grade of society, and is often more obstinate in the children of the noble and the wealthy than in those of the poor. I have been struck by its frequent occurrence in children who have been born in India and brought to this country for their education, and it has appeared to me that this circumstance admitted of explanation, by supposing that their systems had been relaxed and weakened by a hot climate, and that they were consequently unable to resist the morbid effects of the cold of England.

Another predisposing cause of the disease is improper food, and this is a cause which is most active in public schools and large

establishments of children. I have sometimes had occasion to regard the prolonged use of an exclusively vegetable diet as the cause of the affection, and am convinced that a milk diet, continued for a long time without change, will give rise to the disease.

The restraints of mobility and amusement, to which children are subjected in schools, is another and a frequent cause of Ringworm. Confined in ill-ventilated rooms, congregated in considerable numbers, bending their little minds to distasteful labour, commencing their studies the instant they have swallowed their meals, and kept to their books for several successive hours in the day, it cannot be a matter of surprise that the nutritive functions of the body should suffer, and that derangement of one of the simpler actions of the economy should be the consequence. Under such circumstances, the disease will probably be endemic, and the greater part of the children of a large school might be consentaneously or successively attacked.

IS RINGWORM CONTAGIOUS?

I believe that it is not. Nothing that I have hitherto seen, and I have watched the disease with care, has satisfied my mind with regard to its imputed communicability. The observation of a great number of children in the St. Pancras workhouse, as well as in private practice, leads me to an opposite conclusion, and this conclusion seems confirmed by the pathology of the disease.

Those who consider Ringworm to be contagious, look upon it as a local affection, engendering a kind of poison, which is conveyed to another by means of combs, brushes, caps, or towels. The advocates of the vegetable theory do not hesitate to assert, that the nucleated granules are the seeds of the disease. Such a supposition appears to me to be highly unphilosophical, and indeed unwarranted by a more correct comprehension of the nature of those bodies.

If there be a poison, it must be more subtle in its nature than these nucleated granules, and capable, like other contagious

principles, of poisoning the entire circulation of the patient, for the disease undoubtedly lies in the constitution, and is to be eradicated more by constitutional than by local means. In fact, Ringworm is not a local disease, but one which pervades the entire economy, the local disorder being simply the effect of the constitutional disturbance, such as a multitude of causes capable of deranging health might occasion.

It is stated that Ringworm has not been known as a disease affecting the middle and higher ranks of society more than fifty years, although it has existed for centuries among the poor. If this be true, it is a fair argument against its contagiousness, unless, indeed, it can be shown that the laws of life and organization are different in the plebeian and in the patrician; that the rich and ruddy stream of the latter repels a poison engendered in the troubled puddle of the former. But that such is not the case is proved by the fact that the noble and the wealthy are now as liable to the disease as are the poor. Dr. Wilkinson, in suggesting a probable reason

for the outbreak of the disorder among the better classes, observes:—"Of all the various conjectures formed upon this subject, perhaps the most plausible is, that the number of children sent from the East and West Indies for their education has been, during the 'period referred to,' very much increased, many of whom bringing the disease with them, introduced it to the schools, and spread it rapidly through the island." Few of my readers will, I think, be inclined to admit this explanation as correct, but it corroborates the observation which I have myself made of the liability of European children, born in a warm climate, to this disease, when transferred to England.

The same author, in another page of his work, observes:—"As some of the profession doubt whether the Porrigo can be produced in any other way than by contact, I have paid particular attention to this point, and I am convinced that some children are capable of generating the disease."

"Four children were brought to me who had never been out of their parents' house

but in their carriage, never had any other children to visit them, and never visited any; in short, the mother informed me that they were so strictly particular on this point, that they never suffered the servants who attended upon the children to have any communication with others. One of these children generated the *Porrigo furfurans*; and between two and three weeks after communicated the *Scutulata* to two of the others, and the *Decalvans* to the fourth."

Can anything be more clear than that the predisposing cause of the disease in the above instance was the artificial physical education and mischievous restrictions to which the poor children were subjected? Dr. Wilkinson admits that the disease was generated in one of the children, but it may be asked—If so, why not in all? Why should a disease *generated* in one be *transmitted* in the rest? The answer is obvious—Because Dr. Wilkinson was prejudiced in favour of the theory of contagion. The reader may be reminded, also, in reference to this case, that *Porrigo furfurans* and *Porrigo scutulata*

are the same disease, and that *Porrigo decalvans* originates in the same causes which give rise to Ringworm.

Dr. Wilkinson further observes:—"I have had several other cases where I had as much reason to believe that the children generated it: one was a child of only three months old, who had never been, since her birth, in more than one room." Thus it will be seen, that the too great care of parents in regard of their offspring is frequently attended with the same results as extreme neglect. An important rule of conduct, so far as the management of children is concerned, may be deduced from this observation.

In reference to a case already mentioned (page 65), in which the disease was cured in London, and remained so for three weeks, but reappeared as soon as the patient returned to the country, Dr. Wilkinson remarks:—

"During the last three weeks spent in town, as nothing was used to prevent the disease from reappearing, and as it is a *contagious and active fluid*, How is its action suspended for such a length of time? and

Where does it lurk? since its whole action in two or three of the varieties seems confined to the cutis and the cuticle. I can account for this in no other way than by concluding that the patient generates the disease, for in such way of course, however completely it may be banished from the surface, it may be regenerated, unless the habit of body or the secretions be entirely altered."

Another author, Dr. Walter Dick, in an excellent treatise on the "different forms of Porrigo," observes, "We have seen ringworm attacking two or three subjects in the same family, almost at the same time, when the occurrence of the disease could not be traced to contagion. We have been led to believe that the disease, under these circumstances, originates from some article of food being of bad quality." And again, "From what we have observed, we are inclined to think that porrigo is not so contagious as many suppose."

The only circumstance which has at all tended to shake my opinion of the non-contagiousness of ringworm, is that referred to in a previous page, of the occurrence of

patches, apparently of this disease, on the neck or arms of adult females who have had the care of diseased children. These patches never exceed three or four in number; usually there is one only. I have never seen them on the scalp; they are easily cured, or soon get well, if left to themselves; and they are not uncommonly met with in those who have not been within reach of children affected with Ringworm.

TREATMENT OF COMMON RINGWORM.

The indications for the treatment of Common Ringworm are precisely similar to those already laid down for the management of Favus—namely,

1. To restore the defective powers of the constitution.

2. To restore the local power of the skin.

And these objects are to be fulfilled by similar means. The first indication calling for

Improved hygienic conditions;

Improved diet;

Tonic-alterative medicines.

The second requiring

Stimulating applications.

The importance of the hygienic principles, air, exercise, clothing, and ablution, cannot be too strongly urged in Common Ringworm. When the disorder first appears upon the head at school, the child should be immediately removed, either to a more airy locality, or to the sea-side. I have seen several cases in which the disease has been entirely cured by such a change as this, seconded by a better assorted diet, and by a local application of the simplest kind.

It is much to be regretted that some provision is not made, by those who have the care of the education of youth, for supplying the means of instruction to children labouring under this complaint; for combining, in fact, physical education with mental education, and the advantages of sanatory regulations with both. I am quite ready to admit the necessity of separating boys afflicted with this disorder from others; not, however, from any apprehension of contagion, or with a view of protection to the latter, but that the diseased youths may be placed under a training adapted for their cure. Nevertheless, it is painful to reflect that this

isolation is generally accompanied by a total neglect of education, with a loss of months and years wholly unnecessary, and yet which may never be repaired; in some instances, indeed, amounting to the positive destruction of a boy's prospects in life.

I would suggest, as a remedy for this evil, that a school-sanatorium, especially calculated for this object, should be established in some healthy locality, and that the boys assembled in such a school should pursue their studies undisturbed, while the medical discipline necessary for their cure was enforced.

The masters engaged at such a school would be free from any danger of contagion. Indeed, adults are not liable to take the disease under any circumstances. Neither must it be supposed that the assemblage of affected children would be either detrimental to themselves or to those about them.

In speaking of the cause of this disease, I mentioned, as tending to predispose to the complaint, improper diet. I remarked that I had seen cases in which I believed I

could trace the origin of the disorder to a too exclusive vegetable or milk diet, and these are circumstances to be borne in mind in regulating the regimen of our patients. As in Favus, I should give a preference to a sound animal diet, with a good beer, such as brewer's porter,* for drink, and chocolate, cocoa, and tea, in small quantity, for the morning and after-dinner meal. Butter I look upon as highly useful, both in Favus and Trichonosis furfuracea.

The medicines enumerated in the treatment of Favus are those which are best adapted for the present disease. Citrate, acetate, or hydrochlorate of iron; iodide of iron; iron with quinine; nitro-muriatic acid, either alone or with the tincture of cinchona or gentian.

The general functions of the body will require to be regulated in the usual way; but aperients and purgatives are to be used sparingly, and with care. As a laxative, I am in the habit of prescribing the following:—

* In contradistinction to publican's porter.

℞ Confect. sennæ, ʒij.
 Sulphuris sublimat.,
 Potassæ bitartratis, āā ʒss. M.
 Omni mane, vel omni alterâ mane sumenda.

If there be enlargement of lymphatic glands, having a scrofulous origin, the oleum jecoris aselli is to be had recourse to, and if there be any want of solidity in the bones, lime-water.

In Common Ringworm, which is not neglected, there are no crusts to be removed; but should there be any collection of this kind, they are best cleared away with water and soap, after being softened by a poultice, or with the moist compress and oiled silk, as recommended for Favus.

Shaving the head is a practice which I rarely have recourse to, nor do I think the advantage which it holds out at all commensurate with its evils. If the hair be moderately short, the head may be washed and kept in proper order, and nothing more than this is required. I do not think that, as a general rule, shaving strengthens the hair. Some time since, while engaged in investigating the structure and phenomena

of hair, I compared the hair of persons who had been shaved, with that of others in whom that operation had not been performed, and I found no difference between them.

Washing with soap and water, followed by combing with a small-tooth comb, is attended with advantage; the latter process serving to clear away the diseased hairs sufficiently. I have already said that I do not consider these hairs as irritants of the skin, and tending to keep up inflammation, and, therefore, I am not inclined to join with Plumbe in suggesting ingenious contrivances for getting rid of them.

As respects the soap to be recommended in this disease, there is none better than the old-fashioned common yellow soap,* a soap of the finest manufacture, but at present out of favour with housewives on account of its colour; the substitute, a lighter coloured soap, is, however, very inferior. Soft soap has been much in use for washing heads affected with Ringworm, but it is offensive and disagreeable, and in nowise superior to

* To be obtained at Brecknell and Turner's, in the Haymarket, where it is sold at 7*d.* the pound.

the soda-soaps; indeed, I regard it as inferior to the common yellow soap above mentioned.

A good ringworm-soap, called Petroleum soap, is made by Hendrie, of Tichborne-street. As its name implies, it contains petroleum, with which it is strongly impregnated. It is not unpleasant, and I have seen the most decided benefit result from its use.

When the patches are free from their crusts and loosened hairs, I commence the local treatment by pencilling them with acetum cantharidis, or the acidum aceticum fortius, and then anointing the surface with ceratum simplex cum liquore plumbi (ʒj ad ʒj). This application I repeat once in the week; and on the intermediate days, as soon as the irritation caused by the acid has subsided, I prescribe a moderately stimulating ointment, such as the unguentum hydrargyri nitratis, or unguentum hydrargyri nitrico-oxydi, diluted one half with the ceratum simplex. Another ointment, which I have found of service, is one composed of sulphate of zinc and ceratum simplex (ʒj

ad ʒj); and I have also obtained good results from the unguentum sulphuris compositum.

A remedy which I have found most useful in Common Ringworm is the linimentum ammoniæ, accommodating the proportion of alkali to the amount of stimulation which it is desired to effect. Another excellent remedy is the oleum crotonis tiglii, twenty drops to the ounce of unguentum florum sambuci, or unguentum jussis cucumis. Another elegant, as well as useful preparation, is a pomatum of cantharidine prepared by Mr. Savory, of Bond-street. The iodide of sulphur ointment, which I have frequently used, I find decidedly inferior to the above remedies.

As the principle of local management of this complaint is cleanliness and moderate stimulation, many additional remedies might be mentioned as applicable to its treatment. Dr. Hamilton recommends an ointment of cocculus indicus, for which picrotoxine might be conveniently substituted. Bateman recommends the unguentum gallarum. Then there is the iodide of sulphur ointment,

(gr. x.—xxx. ad ℥j.) But a better remedy than either of these, though somewhat objectionable in private practice, from its dirtiness and bad odour, is the following, originally suggested, I believe, by Dr. Wilkinson:—

℞ Sulphuris sublim.,
 Picis liquidæ,
 Axungia, āā ℥iv.
 Cretæ preparatæ, ℥ij.
 Ammonia hydrosulphureti, ℥j. M.

Dr. Walter Dick, in his treatise on Porrigo, recommends for ringworm an ointment of subnitrate of bismuth (℥j ad ℥j), to be rubbed into the diseased parts, night and morning, after washing. The same author refers to another remedy once in high repute for this complaint—viz.,

℞ Olei laurini, ℥iss.
 Sulphuris vivi, ℥ss.
 Pulveris camphoræ, gr. x. M.

Other remedies, which have been from time to time in vogue are, sulphur ointment and soft soap, equal parts of each; the unguentum sabinæ, spirit of turpentine, &c.; adhesive plaster has also come in for its share of praise.

Plumbe was in the habit in this disease of pencilling the patches with strong sulphuric acid, taking care to wash it off as soon as smarting commenced; his subsequent treatment was simple washing. He was also an advocate for shaving the head. In old-standing cases, where secondary changes had occurred, such as the formation of pustules, and suppuration of the hair-follicles, he preferred that the hair should be cut with scissors, but as short as possible, and he recommended that every hair contained in a follicle in which suppuration existed should be drawn out with the forceps. This is a needless operation; and, indeed, the supposed irritative property attributed by Plumbe to the hairs, the apology for the *calotte*, is altogether unfounded. On the whole, Plumbe's treatment is unworthy of his reputation.

Ointments (greasy applications, as they are sometimes disrespectfully called) are undoubtedly better adapted for ringworm than lotions; but if any insuperable objection should be made to their use, a lotion of sulphuret of potass (ʒj ad Oj), sulphate of zinc in rose-water (ʒss—ʒij ad Oj), bichloride of

mercury in emulsion of bitter almonds (gr. x. ad Oss.), &c., might be prescribed. In this case, however, the consequent dryness of the skin should be corrected by cold cream or some simple pomatum.

After the cure of ringworm, there commonly remains for some time, as a consequence of the debility of the skin, a dry and scurfy state of the scalp. The best treatment for relieving this is to dip the head every morning in cold water, and after drying it thoroughly, to anoint the skin well with some simple pomatum, such as the following:—

℞ Olei olivarum, opt. ℥ij.
 Ceræ flavæ, ℥ij.
 Attar petalor. rosar. ℥x. M.

Where there exist objections to dipping the head in cold water, the scalp should be well dabbed, every morning, with the following lotion, and afterwards anointed with the pomatum, as in the previous case:—

℞ Spir. vini rect. ℥iv.
 Spir. rorismarini, ℥ss.
 Aquæ rosarum, ℥iiiiss. M.
 Fiat lotio.

CHAPTER III.

ON DISEASES ANALOGOUS TO, OR LIABLE TO
BE MISTAKEN FOR, RINGWORM.

TRICHONOSIS PLICA.

PLICA POLONICA, OR POLISH RINGWORM.

PLICA POLONICA, so far as I am able to infer from the description of the disease given by authors, is, in its essential nature, analogous to the Common Ringworm of this country. There exists in it, as well as in Ringworm, an enlargement of the diseased hairs, a condition probably depending on the larger size of the nucleated granules; and the latter are the depositories of the morbid fluids which are found in such quantities in that affection. In other words, Plica is a state of *granular degeneration* of the hair, the granules being turgid with a viscous sanguineous fluid.

The state of matting of the hair, which is thought to be peculiar to Plica, has also its analogue in Ringworm, and the conical bundles of which I have spoken when describing the latter are the representatives of the greater and more complete fasciculation of the Polish disease.

According to the best authors on Plica polonica, the scalp is inflamed and excessively tender; the hairs are swollen and imperfectly formed; they are tinged with a viscous and reddish-coloured fluid, and the hair follicles secrete an abundance of this fluid, which agglutinates the hairs, and then by desiccation unites them into a solid mass. The tenderness of the scalp in these cases is so excessive, that the bare touch of a single hair excites pain, and when cut across, the reddish fluid with which the hairs are surcharged oozes from the divided extremity. This appearance, together with the extreme sensibility, has given rise to the supposition of their being sarcofied, and pervaded with vessels and nerves. The odour arising from a scalp so affected is described as being exceedingly disgusting; excoriations of con-

siderable extent are frequently formed, and the matted hair becomes the resort of countless pediculi.

Plica is not confined to the scalp, but affects the hair on every region of the body; the nails of the fingers and toes are also changed, becoming rough, fibrous, and discoloured. Left to itself, the disease lasts for ten or twelve months; the symptoms then subside gradually, the hair returns to its natural diameter, and the filthy mass is pushed by degrees further and further from the surface, until it falls off spontaneously, or is cut away by scissors.

The hair presents some modifications, in the manner of its matting, which bear relation to its length. Thus, in males who wear the hair short, numerous locks are matted separately, constituting the variety known as *Plica multiformis*; at other times, the matted hair forms a single coil, the *Plica caudiformis*; or, again, it may constitute a large and irregular mass without order in its matting, the usual character of the disease in women.

Several authors have asserted, that in the

majority of cases the scalp is not affected in Plica, and that the alteration in the hair occurs at a certain distance from the integument. This assertion is incredible, and it seems more reasonable to conclude, that in the cases adduced in support of this statement, the disease was advancing towards cure, and consequently that the morbid mass of hair was removed by growth from the surface of the scalp. A recent writer on this subject, Dr. Bidder,* makes the following remarks:—"During the past summer, I remained for several weeks in a country where *Plica polonica* is frequent. The disease occurred only in a mild form. In all the cases which I examined, about twenty in number, I found the hair, for a distance varying from half an inch to one inch from the scalp, perfectly natural; one would have believed that the disease had been removed from the head by the growth of the hair. The scalp was perfectly normal, being neither reddened, swollen, nor increased in sensibility, so that disease of the hair would appear to be capable of existing independently of disorder of the scalp in which the matrix is embedded.

* Müller's Archiv., 1840.

“ I also had an opportunity of observing the process of separation of the diseased from the sound hair. Two individuals presented themselves in whom the morbid mass had fallen by spontaneous separation—a rare occurrence. Once alive to the possibility of such a process, I soon discovered in two cases a groove as though made by a ligature around the cylinder of the hair, and forming a perfect line of demarcation between the healthy and diseased portion of the hair. In some hairs, the groove resembled a mere crack; in others, it had proceeded so far that the separation was nearly effected. In other cases, I was unable to discover the line of demarcation.”

Supposing my opinion to be correct with regard to the nature of the disease, its causes will probably be found to be analogous to those of Ringworm. The disorder is most prevalent on the banks of rivers and in the marshy districts of Poland, in which it appears to be endemic. It is met with, as is Ringworm, among the noble* and the wealthy

* In one instance, I saw a mass of matted hair which had been cast from the head of a Polish lady of noble birth.

as well as in the poor; and unlike Ringworm, it occurs in adults as well as in children.

The treatment which is applicable to Ringworm I should conceive to be suited also to Plica. Change of air, improved diet, and altered hygienic conditions must be indubitably necessary, and the same tonic alterative medicines. A prejudice seems to prevail in Poland against the removal of the mass by mechanical means, which I am inclined to think unreasonable. I should certainly suggest the trial of moderately strong stimulating local remedies.

A L O P E C I A A R E A T A .

BALDNESS IN PATCHES.

SYNONYMS : *Porriigo decalvans*, Willan. — *Alopecia circumscripta*. — *Area*. — *Tyria*. — *Ophiasis*.

ALOPECIA has no claim to be considered a disease of the hair, and consequently to be included among the Trichonoses. It is, in reality, a cessation of function of the hair-follicles, depending on loss of power of the skin, and, as I believe, primarily at least, of the cutaneous nerves; in other words, it is a state of local paralysis of these organs. As an effect of the loss of nervous power, the portion of skin to which the nerves are distributed falls into a state of atrophy, the derma and subcutaneous tissues shrink from defective nutrition, the papillary structure of the derma is lost, the epiderma is thin and unnaturally smooth, and the follicles cease to perform their function of producing hairs. When this state of the nerves and of

the skin is general, the resulting case is one of general Alopecia; when partial, it is called Alopecia areata.

It is not my purpose, in this place, to discuss the subject of Alopecia, but simply to show that the disease is entirely different from Ringworm, and to point out the marks of distinction, in order that the error of confounding the two may be obviated. In Alopecia, it must be recollected, there is no disease of the skin, no eruption, no scurf, no stumpy hairs; on the contrary, the surface is smooth and pale, and slightly depressed below the natural level of the rest of the scalp, and entirely divested of hairs, or, if there be any, they are minute and down-like, and correspond in dimensions with the shrunk and dwindled follicles out of which they issue.

There exists, however, a variety of Alopecia Areata, which I have recently had occasion to observe, in which the distinction from Ringworm is not so evident. In this affection, the signs of atrophy of the skin are absent, there is a natural or somewhat increased amount of scurfiness, a natural tint

of colour, and the patches are more or less circular; they are covered with short stumps of hair of irregular length, and it is evident that the hair is broken off.

The characters which distinguish this variety from Ringworm are, the absence of redness of the scalp, of elevation and papillation of the patches, of the same degree of scurfiness, and especially, of the altered appearance of the hair.

The pathology of this affection is curious; the stumps of the hair which are left in the skin look as if they were clubbed at the end, and this appearance is increased by their being darker at the summit than nearer the skin. On closer examination, they are seen to be very slender where they issue from the follicle, then to enlarge, and become, as it were, swollen, and to taper somewhat close to their extremity. It is apparent, also, that, in the act of breaking, the outer layer has given way first, for the fibres project beyond it for a short distance, and are spread out like the hairs of a worn brush.

The measurement of several of these stumps showed their thickness to be, at the

broken extremity, $\frac{1}{500}$ of an inch; at the swollen part, $\frac{1}{300}$; and in the slender portion of the shaft, within the follicle, $\frac{1}{600}$. The average diameter of the human hair is, as I have before stated, $\frac{1}{400}$ of an inch.

It is evident, through the aid of the microscope, that there is no disease of the structure of the hair, but at the larger end its texture looks softer than natural. The slender part is lighter in colour than the other hairs, and is obviously deficient in pigment.

The cause of this peculiar change in the hair is, defective nutrition. It occurs in adults, and principally in young women; and, as far as I can judge, from the few cases that have come before me, the penultimate predisposing cause is, too much confinement to the house, extreme labour, mental anxiety, &c.

The following case will perhaps give a better idea of the causes of the disease, and, in the treatment which I recommended, exhibit the view which I took of its nature.

A young lady, about twenty years of age,

of delicate constitution, nursery governess in a large family of children, was suddenly called upon to take an active share in household management in addition to her own duties, in consequence of the illness of her employer. After some months of much fatiguing anxiety, she perceived her hair come off in unusual quantity whenever she combed it, and observed, moreover, that several bare patches showed themselves on her head. Having communicated this circumstance to the lady of the house, the latter became alarmed for her children, and although they were all free from any disease, and have continued so, the governess was dismissed: her banishment being precipitated by the vulgar impertinence of an ignorant cook, who discovered a Ringworm on her own head. It is needless to observe that the cook's Ringworm turned out a grog-blossom, or something equally appropriate.

When I saw this poor girl, she was placeless, and much depressed in spirits, feeling that dismissal was harsh treatment for the affliction of a disorder brought on by over-

exertion in the cause of her mistress. If I wanted a motive or an excuse for writing this book, I need not have sought a stronger one than that afforded by this young lady's case. A poor creature discarded and homeless, the victim of a baseless prejudice. For it is to be inferred, from what I have already said, that the disease was not Ring-worm.

The constitutional treatment of this case was founded on her general state of health, which I found weakly and delicate. I therefore prescribed Nitro-muriatic acid with gentian, a generous diet, and the sponge-bath* and friction to the skin.

The local treatment consisted in pencilling the patches once a week with strong acetic acid, and in the interim using the cantharidine pomatum daily, with plentiful brushing. The strong acetic acid, as is common in cases where the tone of the skin is lost, produced so little effect, that I was obliged to substitute acetum cantharidis, made with the

* For an account of the nature and properties of the sponge-bath, I must refer to my work on "Healthy Skin." Second Edition.

acidum aceticum fortius.* After a month of this treatment, I was happy to find this young lady very much improved in health, and the hair exhibiting signs of growth.

* I may observe, in corroboration of the view which I take of the pathology of this disease, that in a few weeks the skin lost its comparative insensibility, and it became necessary to dilute the local application, in consequence of the suffering which it occasioned.

GENERAL AND SPECIAL DISEASES
OF THE SCALP.

THE diseases of the scalp admit of a very natural division into special and general. The *special* diseases are such as are met with commonly on the scalp, and occasionally, or only rarely, on other parts of the body. The *general* diseases are such as are found more often on other parts of the body than upon the scalp, but are occasionally limited to the latter.

The SPECIAL DISEASES of the scalp are—

Favus,
Trichonosis,
Alopecia,
Calvities,
Morbi folliculorum.

FAVUS, as I have shown in the first chapter of this treatise, is a disease of the epi-

derma, and on this account might, with great correctness, be termed epidermanosis, (epiderma; *νεσος*, morbus.)

TRICHONOSIS, comprehending the two varieties, furfuracea and plica, is a disease of the hair, and of the epidermal lining of the hair-follicle.

ALOPECIA and CALVITIES are disorders of the vital tissues of the skin, causing arrest of function.

MORBI FOLLICULORUM comprehend several varieties of disordered function of the follicles.

The GENERAL DISEASES of the scalp are—

Eczema,
Impetigo,
Ecthyma,
Pityriasis,
Psoriasis.

Eczema is a disease belonging to the natural group of *effusive inflammations* of the derma.

Impetigo and ecthyma are members of the natural group of *suppurative inflammations* of the derma.

Pityriasis and psoriasis are, in like man-

ner, members of the natural group of *squamous inflammations*.

Eczema, impetigo, and ecthyma are *moist* diseases. Pityriasis and psoriasis are dry diseases.

ECZEMA CAPITIS. The pathognomonic signs of eczema capitis, in its acute stage, are, intense inflammation, swelling, ichorous discharge, suppurative discharge, and thick and extensive crusts, formed by the desiccation of the morbid secretions combined with matting of the hair.

None of these signs are present in favus and trichonosis furfuracea, saving the crusts, which are widely different. Moreover, the hair in eczema is unaltered.

In eczema capitis, in its chronic state, the inflammation is diffused; there is considerable swelling and heat; the discharges may have dried up; there is copious furfuraceous desquamation, but the scales are larger than in trichonosis furfuracea. Moreover, the hairs are healthy in eczema, so that the condition of the hair is an important aid to the diagnosis of these diseases, and where the practitioner has little experience, or may

be in doubt, is one that may safely be relied on. In eczema acutum the discharge tells the tale at a yard's distance, and to the practised eye the hair declares the difference at once between dry eczema and ringworm.

IMPETIGO CAPITIS has, for its pathognomonic signs, pustules, pus, ichorous and suppurative discharges, and thick yellowish and greenish crusts, but *the hair is sound*. Now, in trichonosis furfuracea, although occasionally there are pustules, the hair is obviously diseased, and the crusts are thinner and less extensive. The precisely circular yellow crusts of favus dispersus bear no resemblance whatever to the crusts of impetigo; neither do the dry yellow masses of the confluent variety.

In impetigo in the process of cure, the discharges have ceased, the crusts have broken away, and the scalp is inflamed and in a state of desquamation, but the hair is sound. The hair, therefore, in this disease, as well as in eczema, becomes an important diagnostic test.

ECTHYMA CAPITIS is known by its larger pustules, their highly inflamed base, and

their extreme painfulness. In other respects, they resemble impetigo, and are even more distinct from the ringworms than the latter disease.

PITYRIASIS and PSORIASIS are dry squamous diseases, but they respect the hair. These affections are generally met with on other parts of the body besides the head, and if there be any doubt of their nature on the latter, are sufficiently significant on the former. They are more diffused than trichonosis furfuracea; there are no circumscribed roundish patches, no papillated surface, and no threatening alopecia.

In short, taking a few of the leading and bolder characters of the diseases of the scalp, and placing them once fully before the eyes with a moderate amount of observing power, they will ever after remain fixed on the mind, and render the correct diagnosis of these affections an operation of the most facile accomplishment.

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