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ON

DISEASES OF THE SKIN.

BY

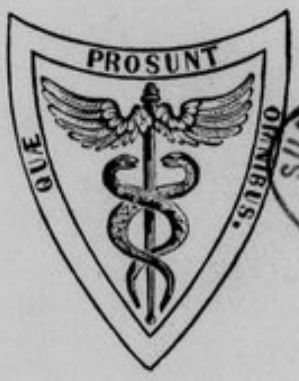
ERASMUS WILSON, F. R. S.

SIXTH AMERICAN

FROM THE

FIFTH AND REVISED LONDON EDITION.

WITH PLATES AND ILLUSTRATIONS ON WOOD.



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PUBLISHERS' ADVERTISEMENT.

In the present edition of these Plates, the Publishers have added those prepared by Mr. Wilson to illustrate his work on "Constitutional Syphilis and Syphilitic Eruptions." In the recent editions of his "Diseases of the Skin," the affections arising from Syphilis have been more prominently and thoroughly treated, rendering appropriate the introduction of the Plates descriptive of them; and it is to be hoped that the series will therefore be found improved in value, as well as completeness.

Philadelphia, *September*, 1865.

PREFACE.

CUTANEOUS MEDICINE is an important branch of GENERAL MEDICINE; it embraces every form of pathological change which takes place in the external surface-tissues of the body. It demands, for its thorough comprehension, all that appertains to the philosophy of General Medicine, as well as the particular knowledge which belongs to the dermal textures. It presents itself to our notice in the double sense of a disturbance of the general organism of the body, and as a disturbance of the special organism of the skin. In the former character it calls upon us to consider the phenomena, as well of the organic as of the animal constitution; in the latter it directs our inquiry into the organism of the skin, both in its normal and in its pathological condition. In its constitutional character, it includes all that concerns the health of the individual; in its special or local character, it comprehends, in an equal degree, all that belongs to the organism of the part: its vessels with their blood; its nerves with their governing principle; its glandular apparatus with their secernent functions; and its various component tissues.

Just as in General Medicine there exist disorders of the organic system, disorders of the blood, disorders of the nervous system, and disorders which are not directly traceable to either of these heads; so, in Cutaneous Medicine, there are disorders with which the glandular system is chiefly concerned; others in which the main cause of evil is the blood; others which are chiefly referable to the nerves; and others which do not exclusively appertain to any one of these sources. And, for the same reason, that, to be clearly understood, the morbid phenomena of General Medicine require to be classified according to some recognized principle; so, also, do the morbid manifestations included by Cutaneous Medicine.

Classification would seem to have been coeval in its origin with the earliest observation of diseases of the skin. HIPPOCRATES laid the foundation of an ETIOLOGICAL CLASSIFICATION, and the basis of a

sound practice, as true at the present day as it was in his own times, when he divided cutaneous diseases into *local* and *constitutional.* Local affections he believed to depend upon some pathological change present in the part, and independent of the general constitution; and constitutional affections he regarded as an effort on the part of nature, to throw out or eliminate a cause of disease by the cutaneous tissues. LORRY adopted the classification of Hippocrates and gave it additional expansion; and the work of Baumés, entitled, "Nouvelle Dermatologie," is founded on a similar hypothesis.

GALEN, following the medical theory of his day, became the founder of a TOPOGRAPHICAL CLASSIFICATION, when he divided cutaneous diseases into such as affect the head; and such as affect the remainder of the body. And this classification has been followed by JEROME MERCURIALIS, a physician of Italy, who flourished in the sixteenth century; by DANIEL TURNER, in England, in 1714; and by ALIBERT, in his first classification, in France.

RIOLANUS, a French physician, who was at the height of his reputation during the latter half of the sixteenth century, tells us that some physicians include all diseases of the skin under three genera, namely, alterations of *smoothness*, of *color*, and of *magnitude;* but that, as this arrangement affords no place for disorders of the hair, others prefer to distinguish them under the three heads of *Pustules*, *Deformities*, and *Tubercles:* Pustules comprehending all eruptions attended with roughness of the skin, whether pimples, vesicles, true pustules, or scales; Deformities, marks of all kinds, morbid coloration, and diseases of the hair; and, Tubercles, warts and condylomata. PLENCK, in 1776, amplified this simple grouping into fourteen classes; namely, Maculæ, Pustulæ, Vesiculæ, Bullæ, Papulæ, Crustæ, Squamæ, Callositates, Excrescentiæ, Ulcera, Vulnera, Insecta, Morbi unguium, and Morbi pilorum; and these fourteen classes he subdivided into one hundred and fifteen genera.

This classification, which treats the visible phenomena of cutaneous disease as Linnæus treated the plants and efflorescence of the vegetable world, is essentially artificial, and, like the botanical arrangement of Linnæus, may be styled the ARTIFICIAL CLASSIFICATION—in other words, the classification of signs or appearances. Pruned of some of its members, the classification of Plenck was adopted by WILLAN, and became the basis of the classification published by him in 1778. The orders of cutaneous diseases of Willan, eight in number, are as follows: Papulæ, Squamæ, Exanthemata, Bullæ, Vesiculæ, Pustulæ, Tubercula, Maculæ.

ALIBERT, in framing his first classification, adopted the topographical basis founded by Galen; but, subsequently, proposed a

scheme of arrangement which he designated the "Natural System." This system embraced the whole of diseases of the skin under the general title of "Dermatoses." The dermatoses were divided into twelve groups, the twelve limbs of the "Arbre des Dermatoses;" and the twelve limbs gave off numerous branches which represented the genera of his classification. Alibert's natural system was arranged as follows:

Dermatoses Eczemateuses.—Erythema; erysipelas; pemphix; zoster; phlyzacia; cnidosis;[1] epinyctide;[2] olophlyctide;[3] ophlyctide;[4] pyrophlyctide;[5] anthrax; furunculus.

Dermatoses Exanthemateuses.—Variola; vaccinia; clavelée;[6] varicella; nirle;[7] roseola; rubeola; scarlatina; miliaria.

Dermatoses Teigneuses.—Achor;[8] porrigo; favus; trichoma.[9]

Dermatoses Dartreuses.—Herpes;[10] varus;[11] melitagra;[12] esthioméne.[13]

Dermatoses Cancereuses.—Carcinoma; keloide.

Dermatoses Lepreuses.—Leuce;[14] spiloplaxie;[15] elephantiasis; radesige.[16]

Dermatoses Veroleuses.—Syphilis; mycosis.[17]

Dermatoses Strumeuses.—Scrofula; farcinoma.

Dermatoses Scabieuses.—Scabies; prurigo.

Dermatoses Hemateuses.—Peliosis;[18] petechiæ.

Dermatoses Dyschromateuses.—Pannus;[19] achrome.[20]

Dermatoses Heteromorphes.—Ichthyosis; tylosis; verruca; onygos;[21] dermatolysie;[22] nævus.

Twenty years ago, when the first edition of this work was published,[23] I constructed a classification founded on the anatomy and

[1] Urticaria.
[2] A nocturnal eruption, disappearing by day, described only by Alibert.
[3] Herpes. [4] Aphthæ. [5] Malignant pustule.
[6] A varioloid of sheep transmissible to man. [7] A varioloid.
[8] Crusta Lactea. [9] Plica polonica.
[10] The squamous diseases, Lepra, including Psoriasis and Pityriasis.
[11] Acne and Sycosis. [12] Impetigo. [13] Lupus.
[14] The Jewish leprosy. [15] Malum mortuum.
[16] The name given to an elephantiasis (?) of northern countries, in Norway.
[17] This genus includes Frambœsia and Molluscum. [18] Purpura.
[19] This genus includes Lentigo, Ephelis, Pityriasis versicolor and Pityriasis nigra.
[20] Vitiligo; Albinismus.
[21] Onychia. [22] Abnormal extensibility of the skin.
[23] The dates of the several editions of this work are: 1842; 1847; 1851; 1857; 1863.

physiology of the skin, a PHYSIOLOGICAL CLASSIFICATION; and I took as the heads of my arrangement the natural division of the skin into—1. Derma proper; 2. Sudoriparous system; 3. Sebiparous system; 4. Hair and hair-follicles. The first of these heads I subdivided into five secondary groups, as follows: Inflammation; Hypertrophy of papillæ; Disorders of the Vascular tissue; Disorders of sensibility; and Disorders of chromatogenous function. And the first of the secondary groups, namely, inflammation, I further divided into: Congestive inflammation; Effusive inflammation; Suppurative inflammation; Depositive inflammation; Squamous inflammation; and inflammation from the presence of Acari.

Time, however, brought with it the conviction, that however well adapted such a classification as the Physiological Classification might be for the student, or for the mere scientific inquirer, it was not equally suitable to the practitioner; and, that, as the primary object of the study of medicine should be to CURE DISEASE; a classification must be sought for that would carry with it the idea and principle upon which our curative operations ought to be conducted. These were the views with which I advanced the classification adopted in the FOURTH EDITION of this work; a classification founded upon the supposed CAUSE of Cutaneous disease; and which I then distinguished as an ETIOLOGICAL CLASSIFICATION. Further experience has confirmed my approval of the etiological classification; so that, although I foresee a probability of improving it at some future period, that time has not yet arrived; and I am content for the present to follow it without alteration.

As the CAUSE of disease is naturally obscure, our appreciation of the nature of a cause must be greatly influenced by the theory of medicine, which has been impressed upon us in our early education, or by the prevalent theory of the day. One theory that has been handed down to us from a very early age, is that of the *humors;* which assumes that the majority of diseases originate in a morbid condition of the humors of the body, and especially of the blood. This is the foundation of the Humoral Pathology, and the disciples of this doctrine are the Humoralists. Humoralism was early adopted as an explanation of cutaneous disease; and the practice which has been founded upon that theory has been most successful in the treatment of these diseases. Theory assumes a morbid alteration of the blood; practice exerts all its powers to remove the offending constituents of the blood, to improve the condition of the blood; in fact, to purify the blood.

But Humoralism does not explain all the known phenomena of

cutaneous disease; and for the simple reason that Humoralism addresses itself only to the fluids of the body; and although it must be admitted that there can be no healthy solids without healthy fluids, yet, on the other hand, the nervous system plays so important a part in the health of the body, and in the health of the blood itself, that we are bound to recognize certain phenomena manifested by diseases of the skin as originating in the nervous system; as being, in fact, neuropathic phenomena. In the treatment of diseases of the skin, we must therefore chasten our humoral views, with views drawn from a neurotic source, with dynamic views; and while we bestow our chief attention on the purification of the blood, we must at the same time comprehend the importance and secure the integrity of that governing influence, the nervous power.

Reviewing the long list of cutaneous diseases, we might select a group which originate in the presence of a *poison* in the blood, which, in a pathological point of view, may be regarded as an effort of nature to eliminate a poison which has been accidentally admitted into the blood, and which is in its nature foreign to the blood. Such is the group of exanthematic fevers, "*diseases arising from animal poisons of unknown origin, and giving rise to eruptive fevers;*" and "*diseases arising from the syphilitic poison.*" But even in these diseases we have to regard not merely the action of the poison on the blood, but also its influence on the nervous system. Irrespective of the neuropathic symptoms which accompany these disorders, and follow in their train as sequelæ, the occasional paralysis, partial or complete, we not unfrequently hear of cases of "nervous small-pox," and we recognize the intense neuralgia of syphilis. We have, therefore, in the treatment of these diseases, to balance our humoral views with a remembrance of the necessity of keeping up the tone and power of the system,—we must act the part of dynamo-humoralists.

In another and very important, because the most common of the diseases of the skin, namely, the eczematous group, we have also an impure state of the blood, but an impurity different from that of the preceding, not a poison foreign to the blood, but *an impurity* depending on mal-assimilation, crude and morbidly altered organic elements and effete material, which has failed to be eliminated by the proper emunctory organs. This accumulation not unfrequently results from a preceding deficiency of power of the nervous system; or acting upon individual nerves, may give rise to a morbid alteration in the tissues which those nerves supply, constituting an apparently local eczema. Here, again, we see the necessity of combin-

ing the neuropathist and the humoropathist in administering to the one harmonious whole, which nature had in view in the construction of the animal frame. Weak nerves may be the occasion of morbid blood, morbid blood may react on the weakened nerves, or if the morbid blood precede the weak nerves, then the neuropathic phenomena will be secondary. As in the preceding group of diseases, the principle of treatment must be humoralist, so far as the correction of the impurity of the blood, dynamic, to support the tone of and invigorate the nervous system.

In another group of cutaneous diseases, the affection of the nerve obviously precedes the cutaneous disorder; and there exists no ground for suspecting a faulty constitution of the blood;—for example, Herpes; a draught of cold air chills a cutaneous nerve; the tissues to which the filaments of that nerve are distributed are lowered in tone; circulation is disturbed, retarded, congestion and vesication follow. In Herpes Zoster, we see the curious and striking phenomenon of the affection of the cutaneous branches of a single intercostal nerve. Here the healthy blood must be assumed to be the irritant, acting on tissues depressed in their vitality by the previous injury done to the nerve by the simple operation of cold. Commonly the nerves which govern the circulation and nutrition of the part chiefly suffer; but sometimes the sensitive filaments are also affected, and then we may have neuralgia in every degree, from simple tingling, smarting, and pricking, to intense and deep-seated pains, which are obviously referable to the trunk of the nerve. In cases such as these, we cease to be humoralists, unless we can find some error of digestion or assimilation also present; we are for the time being Dynamists. But the respective attributes of humoralism and solidism are too precious to permit us to part willingly with either; we will be "big of heart" and hold both.

In the influence of Cold and Heat upon the skin we have striking examples of the Neuropathic Theory. Let us take the everyday example of a common chilblain. A healthy child is exposed to the cold; the cold seizes chiefly on the peripheral parts of the body, because in them the nervous filaments are the least protected; the part is benumbed, the tissues are lowered in their tone, their vitality is reduced; circulation returns, the vessels, having lost their contractility, no longer carry the blood as actively as usual through the weakened tissues; the blood accumulates, this is congestion; inflammation follows, and with inflammation its consequences. This is clearly an example of pure blood acting as an irritant upon the tissues of the skin, in consequence of their deprivation of nervous power.

It would be easy to accumulate examples in which the nerves, governing the circulation, the nutrition, the tone, and the sensation of the skin, are weakened and injured by disease; but I will satisfy myself with one further example, namely, *alopecia areata*. On a circular plot of skin of the scalp, probably in close relation with a branch of a cranial nerve, the hair has fallen off, the part is bare, it is thin, it is pale, it is lowered in sensibility. There can be no doubt as to the pathological condition of this portion of skin. We can see it, we can touch it; we can bring our best organs of sense and judgment to bear upon it. Its nutritive power is exhausted, for it is thin, and it is no longer capable of performing its normal function of producing hair; its circulation is diminished, for it is pale and anæmic; its sensitive nerves must be more or less paralyzed, for its sensibility is to a considerable extent lost. Here, again, is a case in which our dynamic influence must be brought to bear upon our patient. We must improve nutrition, we must improve innervation, both generally and locally.

That same great mind that taught us the importance of recognizing the constitutional origin of local disease, also impressed upon us the delicate handling of the local disorder, whether proceeding from a constitutional or from a local cause. That certain diseases obviously proceed from a local cause, and are in their essence local diseases, and independent of constitutional influence, is the natural inference to be drawn from the foregoing prolegomena. This truth has been strongly impressed upon us by the celebrated dermatologist of Vienna, HEBRA. Many cutaneous diseases which in this country, and with our humoral tendencies, we should be led to treat by constitutional as well as by local means, Professor Hebra would treat by local means alone, and the great success of his treatment leads us to inquire at what point between the two extremes the truth lies concealed. I believe that our lesson will be best learned by devoting more attention than heretofore to local treatment; and not less to constitutional treatment. The great excellence of the treatment of disease in England depends upon the proper appreciation of its almost universal constitutional origin. During his late stay in London, Professor Hebra honored me with his presence in my consulting-room on several occasions, and has left on my mind an ineffaceable impression of his rapid and sound diagnosis, and his extraordinary tact in the local management of cutaneous diseases. He is too sound a physician to reject constitutional means; but he declares that they are much less needful than is believed by us, and that a very considerable number of diseases are local in their nature, and may be perfectly cured by local remedies.

The name of Hebra leads me to another topic. Those who have honored me by perusing my writings and following my inquiries, may have noted the difficulty which I have experienced in dealing with the word "psoriasis." By my immediate predecessors, and especially by the French, I found the words psoriasis and lepra used synonymously, both being applied to one and the same disease. Again, it was not unfrequent, as in the writings of Bateman, to see the term psoriasis, besides being used synonymously with lepra, also applied to eczema in its most chronic period, when it is accompanied with considerable thickening and extensive desquamation of the diseased patch. Hence, to clear away the confusion occasioned by the misuse of this term, I recommended its abolition, or, at the least, its application solely to the chronic eczema above noted. But it may very properly be asked, Why call eczema by any other name than its own? I can only answer, that I have done so heretofore in deference to authority, and to a widely-spread custom. Perhaps the moment has come, and I hope it has, when a better, and possibly the proper use of the term, may be recognized.

To return to Hebra. The term LEPRA—*der Aussatz* in German—signifies THE eruption, the great eruption. It is synonymous with LEPROSY, THE leprosy, the ancient leprosy, that which has since been called elephantiasis. Therefore, let us bestow the term lepra where it rightfully belongs, or reject it altogether. The trivial affection which we at present call lepra has no single point of comparison with leprosy. We cannot but admit the truth of this argument, and we cannot, also, but recognize in an instant the monstrous absurdity of calling a comparatively insignificant disease by so portentous a name. Let us suppose a patient addressing his medical adviser: "What is the name of my complaint, Doctor?" And now I will ask any medical man to whom this question has ever been addressed, to reflect on the pang which has gone through his entire frame before he has brought himself to give the only possible answer—"Lepra." "What!" exclaims the startled patient, "Leprosy?" And then the apologetic response—"No, not leprosy; lepra." And the medical man can only hope that the patient will not go at once to his dictionary, and find out that either the dictionary is wrong or the Doctor.

Now, Hebra cuts the Gordian knot. Eczema he calls eczema; lepra, lepra; and that very common affection which we at present term lepra, he calls psoriasis. The change is simple, the reasons for it important. We cannot do better than adopt it. Moreover,

it suits the spirit of the British bull-dog to call things by their proper names, and we are too noble in our nature not to recognize and value the intellect of our foreign brethren. The great International Exhibition of 1862 will not have existed in vain, if it have accomplished no more than to enable us to give the proper name to a very common and troublesome disease.

In the present edition the reader will find numerous emendations and additions, both in pictorial and typographic illustration.

London, November, 1862.

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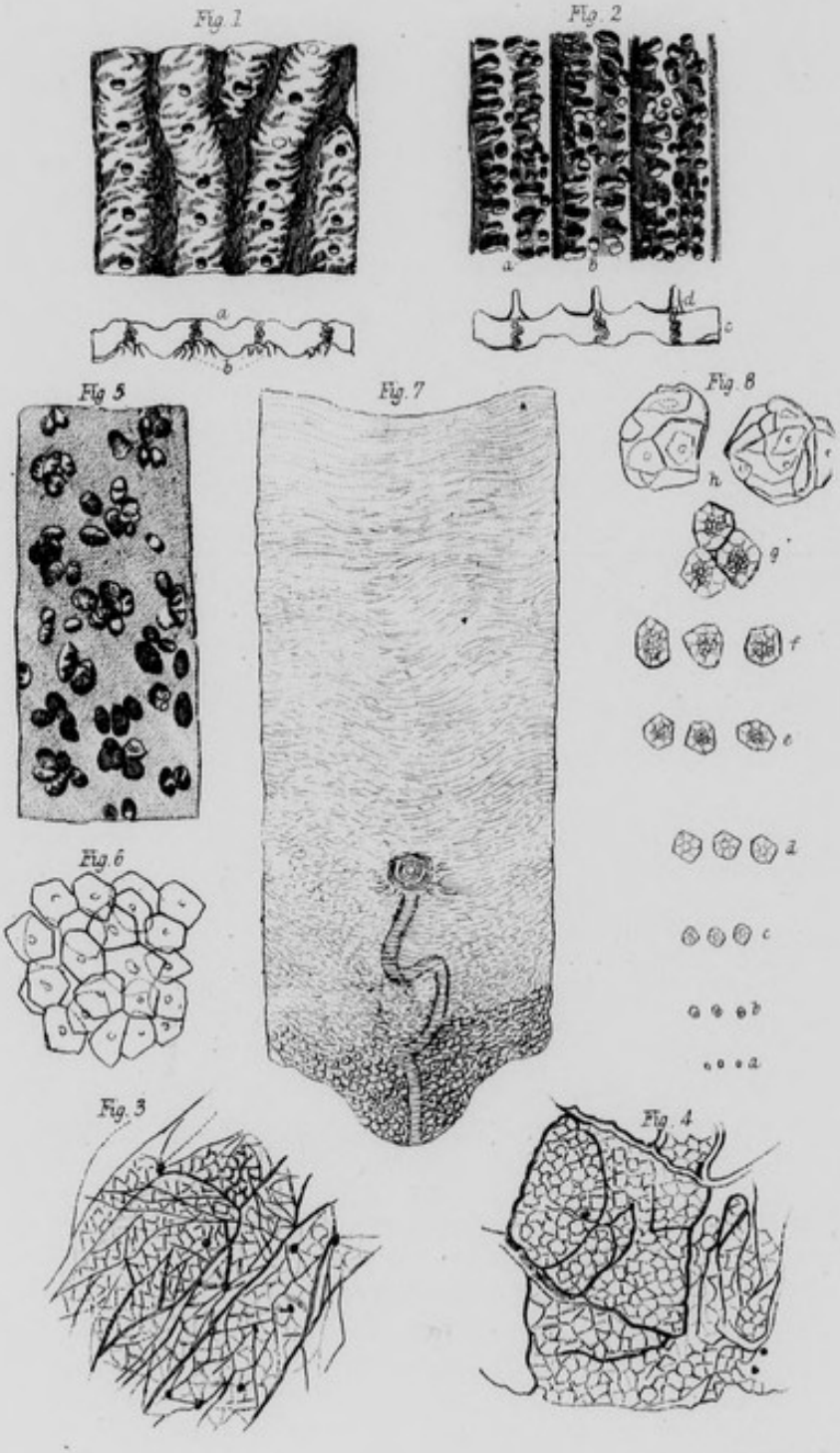

Erasmus Wilson, del.

H. Jordan, sc.

DESCRIPTION OF THE PLATES.

PLATE 1.[1]

STRUCTURE OF THE EPIDERMIS.

FIG. 1. A small portion of epidermis from the palm of the hand, magnified 19 times. The parallel arrangement of the ridges, and the manner in which they terminate abruptly every here and there, is shown in this figure; as well as the circular pores of the perspiratory tubes. *a*. A vertical section, showing the elevation of the ridges of the preceding. *b*. Represents the tufts of papillæ of the derma, which are the cause of the ridges. The spiral coil running up from each tuft is a perspiratory tube.

FIG. 2. The under surface of a portion of epidermis from the palm of the hand, magnified, like the preceding, 19 times. The ridges and grooves are the reverse of fig. 1. In each of the three grooves represented in this figure are seen numerous oval-shaped depressions for the tufts of papillæ of the derma, and running along the middle of each groove, a slightly elevated line, *a*, upon which, at short distances, are the conical sheaths of the perspiratory tubes. *b*. One of the conical sheaths in question. *c*. A vertical section of the preceding figure. If this be compared with fig. 1, *a*, the correspondence of the two will be seen. *d*. One of the conical sheaths of a perspiratory tube, projecting from the middle of the groove; similar conical sheaths are seen in the other two grooves.

FIG. 3. A portion of epidermis from the armpit, magnified 19 times. The numerous lines crossing the figure are furrows adapted to the motions of this part of the body. In the compartments between these furrows, smaller divisions are seen corresponding with the papillæ of the derma. The round spots scattered over the surface are the pores of hair-follicles and sebiferous follicles.

FIG. 4. A portion of epidermis from the back of the thumb, magnified 19 times. The lines of motion and compartments have a different arrangement from those in the preceding figure, but in nature are the same. The little prominences caused by tufts of papillæ are more strongly marked, and there are several pores of hair-follicles scattered over the surface.

FIG. 5. A portion of epidermis from the back of the hand, viewed upon its under surface, and magnified 38 times. The depressions correspond with the papillæ of the derma. This figure illustrates the irregular distribution of the dermal papillæ, as compared with fig. 2, in which the depressions are arranged in rows.

FIG. 6. A thin fragment of epidermis, magnified 155 times, showing its con-

[1] The figures in the first six plates were drawn with the camera lucida; their relative size is consequently preserved.

struction of flat, polyhedral, overlapping scales, in some of which a nucleus is seen.

FIG. 7. Vertical section of a portion of epidermis from the palm of the hand, magnified 155 times. In the lower part of the figure the section has cut across, and then proceeds nearly parallel with, a tortuous perspiratory tube. The cells, of which the epidermis is composed, are more open in the lowest than in the upper parts of the figure; a nucleus, also, is seen in the cells of the lower stratum, while in the upper the cells are converted into thin scales.

FIG. 8. A series of epidermal cells, magnified 310 times, showing the mode of growth of the cells, and their ultimate conversion into scales. These changes take place in the lowest stratum of fig. 7. *a*. Primitive isolated granules, measuring about $\frac{1}{20000}$ of an inch in diameter. *b*. Aggregated granules, composed of several of the preceding, measuring about $\frac{1}{10000}$ of an inch. *c*. Nucleated granules, measuring about $\frac{1}{4500}$ of an inch. *d*. Cells measuring $\frac{1}{3000}$ to $\frac{1}{2500}$ of an inch. The deepest layer of the epidermis is made up of the four preceding elements, and has the appearance of a smooth but irregular mosaic. *e*. Cells measuring $\frac{1}{2000}$ of an inch. *f*. Cells measuring $\frac{1}{1500}$ of an inch. *g*. Cells measuring $\frac{1}{1200}$ of an inch. In all the figures from *d* to *g*, the cell is composed of a granular centre or nucleus, and of a number of newly-formed young cells, which are arranged around it. *h*. Two fully-formed cells, measuring $\frac{1}{800}$ of an inch in longest diameter, and converted into flattened scales. These scales have resulted from the growth of the granules and young cells of *g*, so that the perfect cell contains cells of secondary formation, and, within some of the latter, smaller cells of tertiary formation; this is a good illustration of a "parent-cell."

PLATE 2.

ANATOMY OF THE DERMA AND NAIL.

FIG. 1. A small portion of derma, comprehending two ridges, from the palm of the hand, magnified 38 times. Each ridge is composed of two rows of tufts, and each tuft of a number of papillæ. Between the rows of papillæ, at short distances, are seen the openings of perspiratory tubes. *a*. One of the ridges. It is this arrangement of papillæ which causes the appearances of the epidermis, shown in figs. 1 and 2, plate 1.

FIG. 2. A portion of derma from the back of the hand, magnified 38 times. The papillæ are seen, singly and in small clusters, scattered irregularly over the surface. The epidermis, modelled upon such a surface as this, would have the appearance represented in figs. 3, 4, and 5, plate 1.

FIG. 3. A section of the skin of the palm of the hand, the section being made through the middle of one of the ridges, and not across the ridges, as in plate 1, fig. 1, *a*. The figure is magnified 38 times. *a*. The epidermis, showing its laminated texture, and four spirally twisted perspiratory tubes which traverse it. *b*. The papillary layer of the derma; three tufts of papillæ are seen. *c*, *d*. The corium of the true skin; in its upper part, namely at *c*, being close and dense in texture; and in its deeper part, as at *d*, composed of strands of fibres of considerable size. *e*, *e* Little cushions of fat, which occupy the interstices of the strands of fibres in the deep part of the corium. *f*. The network of capillary vessels lying at the base of the papillæ, and supplying the latter with blood, by means of

Fig. 1

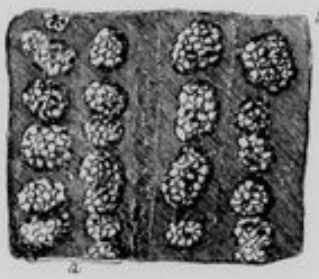

Fig. 2

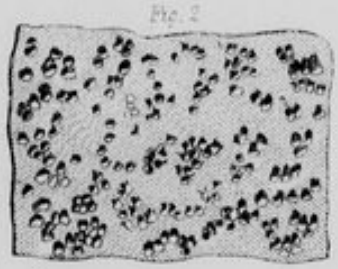

Fig. 3

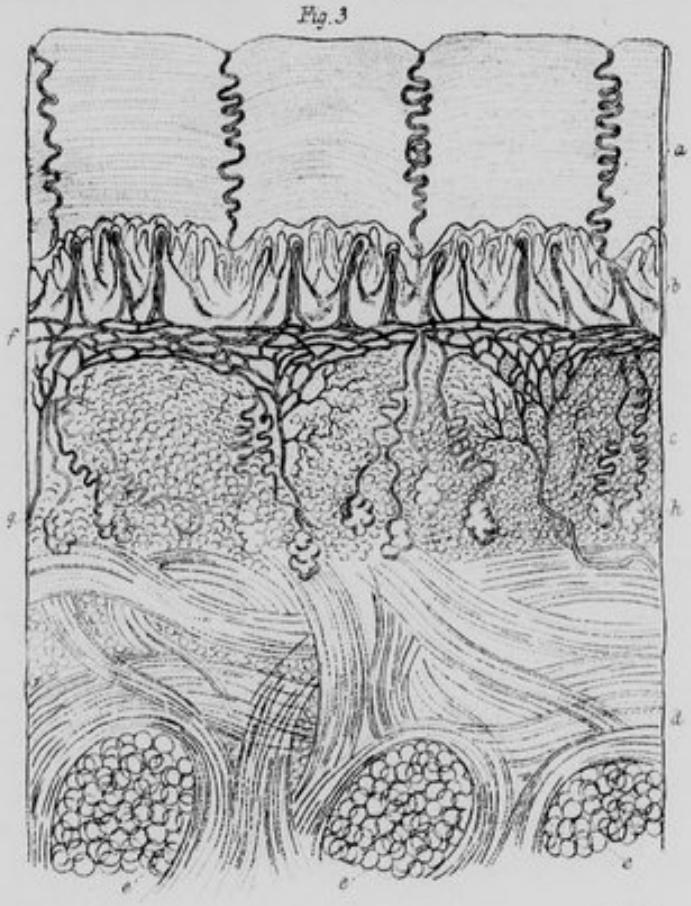

Fig. 4

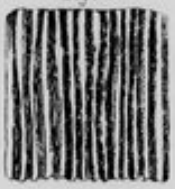

Fig. 5

Fig. 6

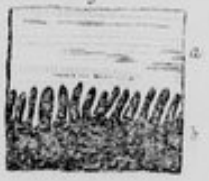

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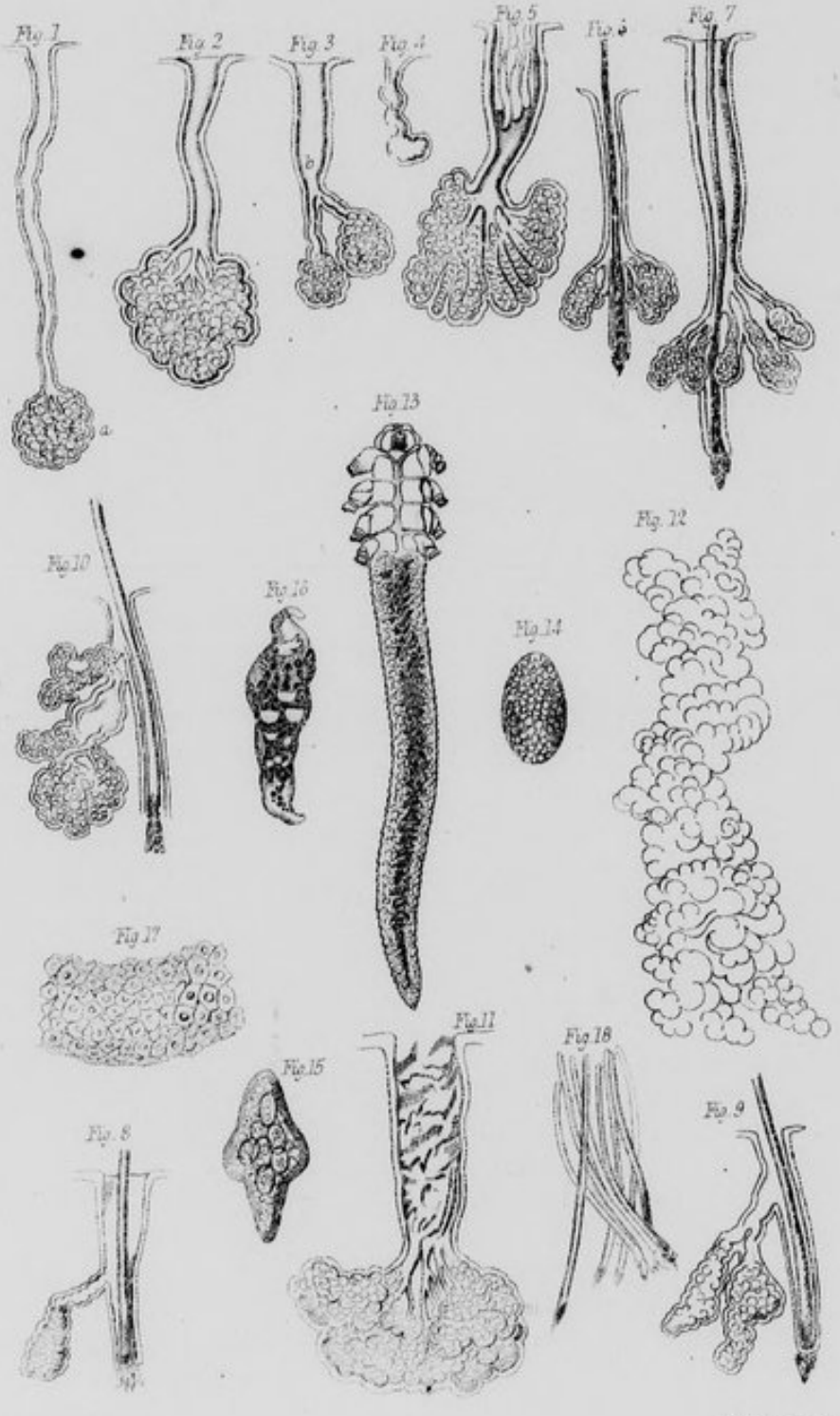
PLATE 3



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H. Jordan, sc.

capillary loops, of which several are seen in the figure. *g*. One of the arteries conveying the blood to the capillary network; two others of the same kind are seen in the figure. *h*. Two perspiratory glands, with their twisted tubes. Several other glands and tubes are seen in the figure.

FIG. 4. A portion of the derma forming the matrix of the nail, magnified 19 times. In this situation the derma is disposed in longitudinal folds.

FIG. 5. One of the longitudinal folds of the matrix of the nail, magnified 38 times. *a*. The depth of the plait in which the capillary vessels are distributed in the form of loops. *b*. The horizontal network from which the capillary loops spring. *c*, *c*. Arteries supplying the horizontal network.

FIG. 6. Vertical section of a portion of finger nail, made transversely to the longitudinal folds, magnified 19 times. *a*. The nail, laminated in texture, is prolonged by a number of thin plates into the substance of the derma. *b*. The portions of derma included between the horny plates of the nail are the longitudinal folds of fig. 4.

PLATE 3.

ANATOMY OF THE SEBIPAROUS GLANDS.

FIG. 1. A sebiparous gland from the scalp. The excretory duct is slightly twisted; *a*, is the gland. All the figures from 1 to 11 are magnified 38 times.

FIG. 2. Another sebiparous gland from the scalp, showing difference of size.

FIG. 3. A sebiparous gland from the skin of the nose. The gland is double, and communicates with the excretory duct, by means of two smaller ducts. If it be imagined that the duct *a*, *b*, is filled with concreted sebaceous substance, the form, size, and situation of the so-called "grub" will be understood. The extremity at *a* will become blackened by the dirt floating in the atmosphere, the rest retaining its natural whiteness.

FIG. 4. Another sebiparous gland from the nose. The excretory duct exhibits a spiral twist, like that of a perspiratory duct.

FIG. 5. Another sebiparous gland from the nose. The duct is filled with the peculiar animalcules (steatozoa folliculorum) of the sebaceous substance; their heads being directed inwards.

FIG. 6. One of the fine hairs, with its appended sebiparous glands, from the ear.

FIG. 7. A small hair from the scalp, with its sebiparous glands. The latter form a cluster around the shaft of the hair-follicle.

FIG. 8. A hair with its follicle and appended sebiparous gland, from the meatus auditorius.

FIGS. 9, 10. Sebiparous glands, of more complicated structure, from the same situation; connected with hair-follicles.

FIG. 11. A sebiparous gland and duct of larger size than the preceding, from the meatus auditorius.

FIG. 12. A sebiparous gland from the lower eyelid; magnified 19 times. The lobulated structure is shown.

FIG. 13. A full-grown specimen of the animalcule of the sebaceous substance, the steatozoon folliculorum.

FIG. 14. An egg of the same animal.

FIG. 15. The form assumed by the egg, previously to the development of legs and other characters of the perfect animal.

FIG. 16. A young specimen undergoing the process of casting its skin.

Fig. 17. A small portion of the epithelial sheath of a perspiratory duct, magnified 310 times. It is seen to be composed of a regular mosaic of nucleated cells, the hexagonal and pentagonal forms of the cells being occasioned by their mutual pressure. The relative thickness of the area of the tube and its walls is also indicated.

Fig. 18. A group of downy hairs, from the compacted sebaceous substance of a sebiferous follicle; they are magnified 19 times The peculiar shape of these little hairs is shown in the figure; they are rounded at the ends, and very little smaller in this situation than in the shaft. Their *worn-out-paint-brush-like* roots are also seen.

Plate 4.

ANATOMY OF THE HAIR.

Fig. 1. A small portion of the shaft of a human hair, magnified 310 times. The waving lines caused by the free edges of the overlapping scales are seen, as is their projection along the edge of the hair. The reason of a hair feeling rough when pulled, from point to root, between the fingers, will be perceived at once, on examining this figure.

Fig. 2. A small portion of the shaft of a human hair, magnified 310 times, showing the appearance of the fibrous structure. The dark streaks are the seat of color of the hair, and in proportion to their number the hair is lighter or darker in its degree of shade.

Fig. 3. Horizontal sections of hair from the beard, magnified 155 times. In this figure the oval shape of the shaft of the hair is seen, as well as the three portions of a hair, namely, its medulla; the fibrous part surrounding the medulla, and constituting the chief bulk of the hair; and its outer transparent cortical layer.

Fig. 4. A hair from the scalp, showing its position in the hair-follicle and its mode of implantation at the bottom of the latter. *a*. The epithelial sheath of the hair-follicle. *b*, *c*, *d*. The bulb of the hair, composed of cells in process of transformation. At *b* the bulb separates into two portions, namely, the hair, and its enveloping sheath. The figure is magnified 38 times.

Fig. 5. A small fragment of the fibrous structure of a hair, magnified 310 times.

Fig. 6. A fragment of the pith of a swan's feather, showing its composition of globular cells, very little altered in shape by contact.

Fig. 7. Hair of the fallow-deer, magnified 38 times. The middle layer of this hair, instead of being fibrous, is made up of polyhedral cells; which are simple globular cells pressed into an angular form by contact, like the cells of a honeycomb. These hairs are consequently excessively light and brittle.

Fig. 8. A portion of the shaft of a very small pheasant-feather; showing the exact similitude between its pith and the cellulated structure of the hair of the deer.

Fig. 9. Barbs from the vane of a small pheasant-feather, magnified 310 times. *a*. Part of a barb from near the shaft of the feather, showing its composition of a series of oblong, flattened cells, with nuclei. *b*. One of the floating barbs from near the quill: the cells in this figure are longer and more slender than in the preceding, and there is a tendency to division at the upper end of each. *c*. One of the barbs from the upper end of the feather. It is composed of a series of oblong cells with nuclei, like *a*, but

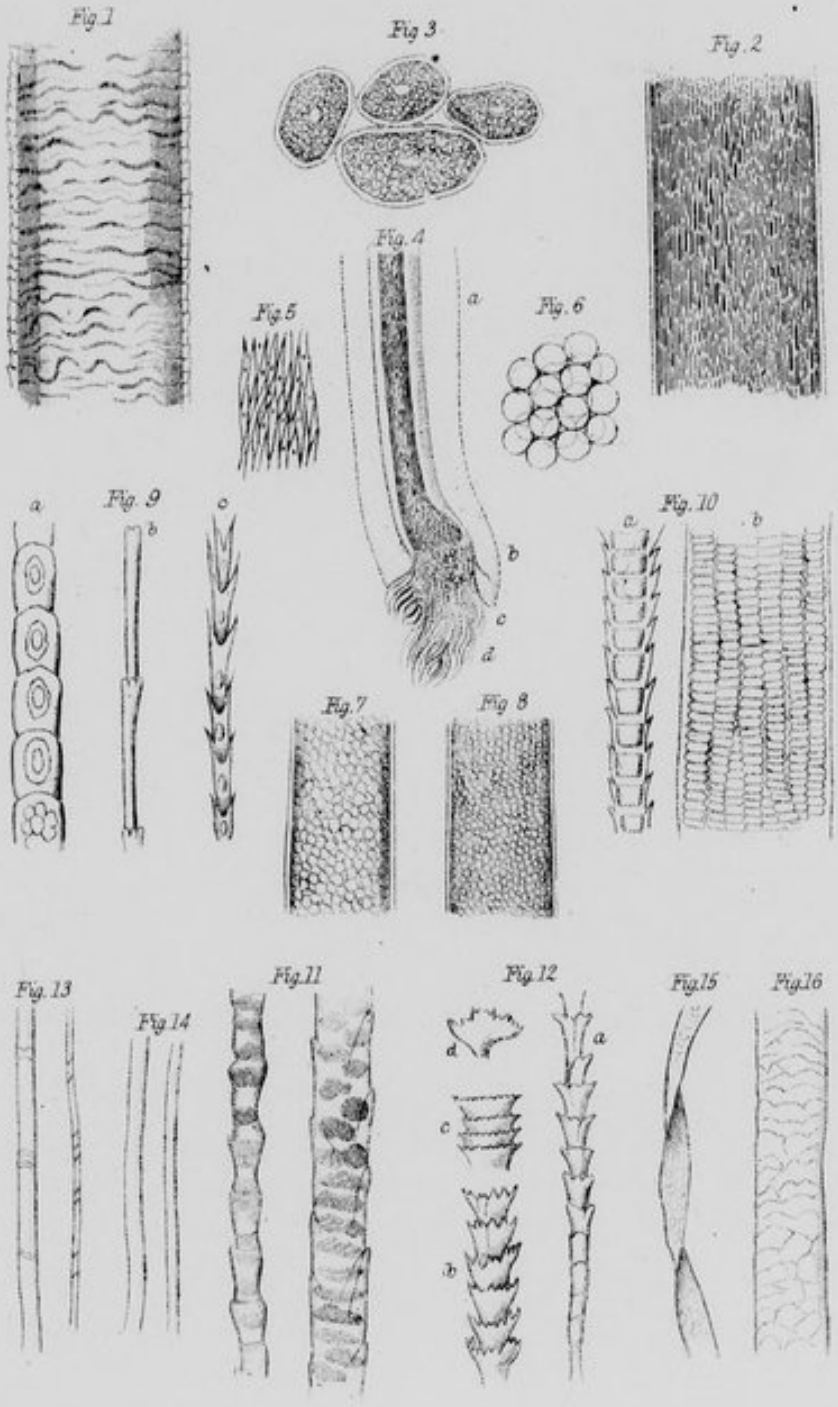

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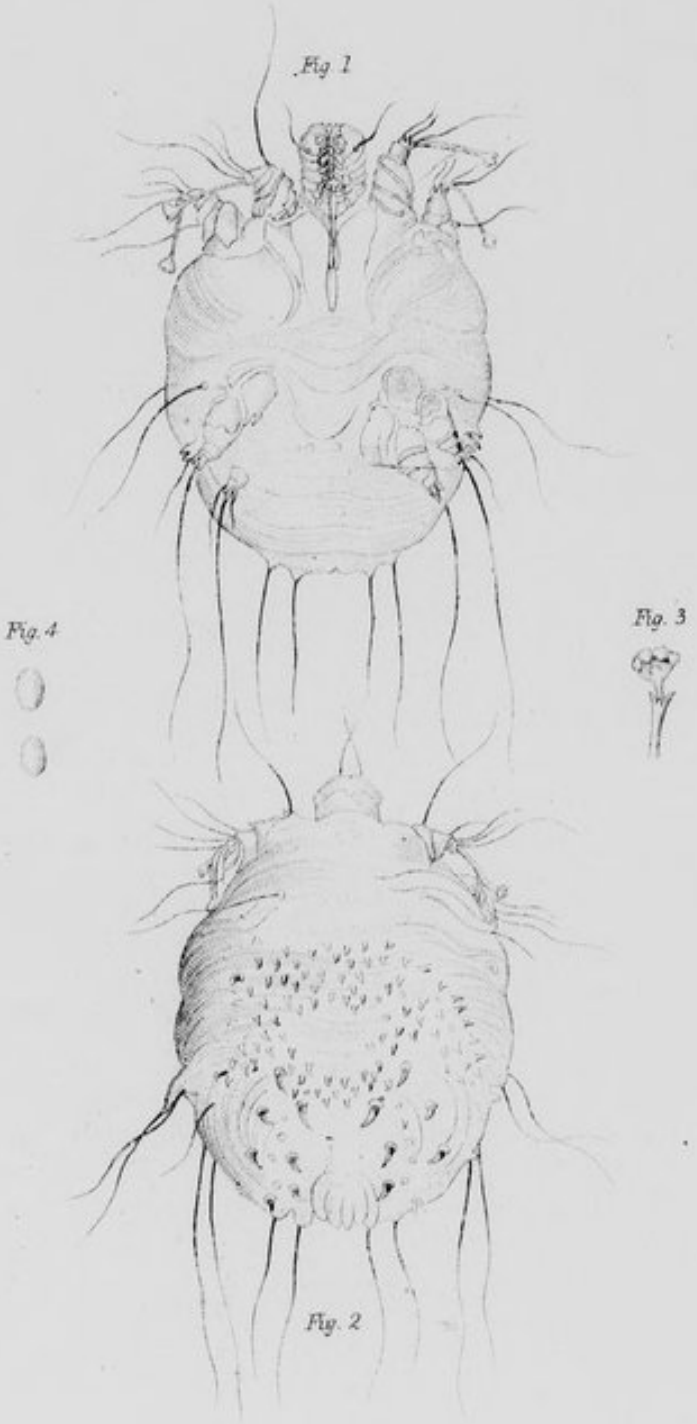
PLATE 5



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the cells are more elongated, and are divided at the upper end into two little spurs. When it is recollected that these three modifications occur in a single small feather, modifications, it will be perceived, of the same essential parts, the mind will be prepared for modifications of a similar kind in the hairy coverings of different animals, and will be able also to trace through such modifications the identity of the original element, a *cell*.

Fig. 10. Portions of two hairs from the common hare. *a*. A small hair consisting of a single row of cells, inclosed by a transparent envelope of scales. At its upper part this hair is beginning to enlarge in consequence of the division of the single cells into pairs. Further still, a third series of cells (not shown in figure) was introduced with a still further increase of bulk of the hair. This structure forms a transition to *b*, one of the large hairs, in which a number of series of simple cells are collected together, and inclosed in a transparent envelope composed of scales. The smaller hair is magnified 310 times, the larger 155 times.

Fig. 11. Hairs of the mouse magnified 310 times. Figure *a* represents the hair near its root. *b*. Is taken from a portion of hair further onwards in the shaft, where it has become thicker, and is still enlarging. The structure, it will be observed, is essentially the same as fig. 10, a series of cells separated by interspaces, and inclosed in an envelope of scales, the latter being somewhat more strongly marked. The enlargement of the hair occurs in consequence of the multiplication of the rows of cells, as is seen in the upper part of the figure. Moreover, the cells in the hair of the mouse contain the black pigment which gives the gray color to its coat.

Fig. 12. The hair of the Indian bat magnified 310 times. This hair is remarkable for the curious modification of its external scales. *a*. Is one of these hairs near its root; at its lower part the peculiarity in the scales is lost, and it bears a resemblance to the structure of *a*, fig. 9, while above it reminds us of *b* and *c*, fig. 9. *b*. A portion of the same hair higher in the shaft. *c*. A portion from the hair at a still higher point. *d*. One of the separate scales; two of these complete the circle around the shaft. Near the upper part of *a*, one of the scales is broken away.

Fig. 13. Two fibres of linen magnified 155 times.

Fig. 14. Two fibres of silk magnified 155 times.

Fig. 15. A fibre of cotton magnified 155 times.

Fig. 16. A fibre of wool magnified 310 times. This fibre is, obviously, a hair, and has its characteristic scaly surface. The specimen selected is Berlin wool.

Plate 5.

THE ITCH ANIMALCULE, ACARUS SCABIEI.

Fig. 1. The animalcule 107 times magnified, and viewed upon its under surface.

Fig. 2. The same animalcule, viewed upon its upper or dorsal surface.

Fig. 3. One of the fore-feet of the animalcule magnified 456 times, and viewed upon its plantar aspect.

Fig. 4. Two of the ova of the animalcule magnified 38 times.

Plate 6.

STRUCTURE OF WARTS AND CORNS, TOGETHER WITH SOME DISEASES OF THE SEBIPAROUS GLANDS.

Fig. 1. Section of a wart, from the armpit, magnified 19 times. The enlarged papillæ of the derma, inclosed in conical sheaths of epidermis, are seen.

Fig. 2. A cluster of the enlarged papillæ of the wart, withdrawn from their epidermal sheaths. This figure is magnified, like the preceding, 19 times.

Fig. 3. A portion of the epidermis covering a wart, magnified 38 times, and viewed upon its under surface. In this view, the openings of the conical sheaths of the papillæ are seen, together with a circle of pigment cells around the base of each.

Fig. 4. The structure of a corn, illustrated by means of a diagram in section. *b*, *b*. The derma surmounted by its papillæ. *d*, *d*. The thickened epidermis, which is seen to be laminated; the broad dark streak, *e*, is the discolored remains of a stratum of blood, poured out when the matter of the streak rested on the surface of the derma.

Fig. 5. A spine taken from a boy suffering under the "porcupine disease" (ichthyosis sebacea spinosa; page 568); the whole body was covered with spines of this kind, standing out, nearly perpendicularly, from the surface of the skin. The spine is magnified 19 times.

Fig. 6. A portion of skin, affected with small tumors, caused by enlargement of the sebiparous glands; molluscum simplex; (page 573.) The tumors are drawn to the size of nature.

Fig. 7. One of the enlarged sebiparous glands of the above disease removed from its envelope of skin, in order to show the lobulated conformation of the gland. The figure is several times magnified.

Fig. 8. The altered cells of the sebaceous substance contained in the ducts, in the above disease. The group of cells, A, is magnified 38 times; the group, B, 310 times. The average size of these altered cells is $\frac{1}{850}$ of an inch in diameter.

Fig. 9. Section of the pimple of acné (page 594), with its associated sebiparous gland, several times magnified. *a*. The conical pimple. *b*. The aperture of the sebiferous duct: when the sebaceous substance contained within the duct becomes blackened at the mouth of the tube by contact with the atmosphere, the case is one of acné punctata. *c*. The sebiferous duct distended with sebaceous substance. *d*. The sebiparous gland.

Fig. 10. Hairs which have become coiled into a spiral form, by the occurrence of impediment at the aperture of the hair-tube; magnified 19 times. *a*. Represents a single hair; at *b*, there are two such hairs. The shaft of the hair is straight up to the aperture of the hair-follicle, where the coil commences. This state of the hairs gives rise to the disease termed morbus pilaris (page 632).

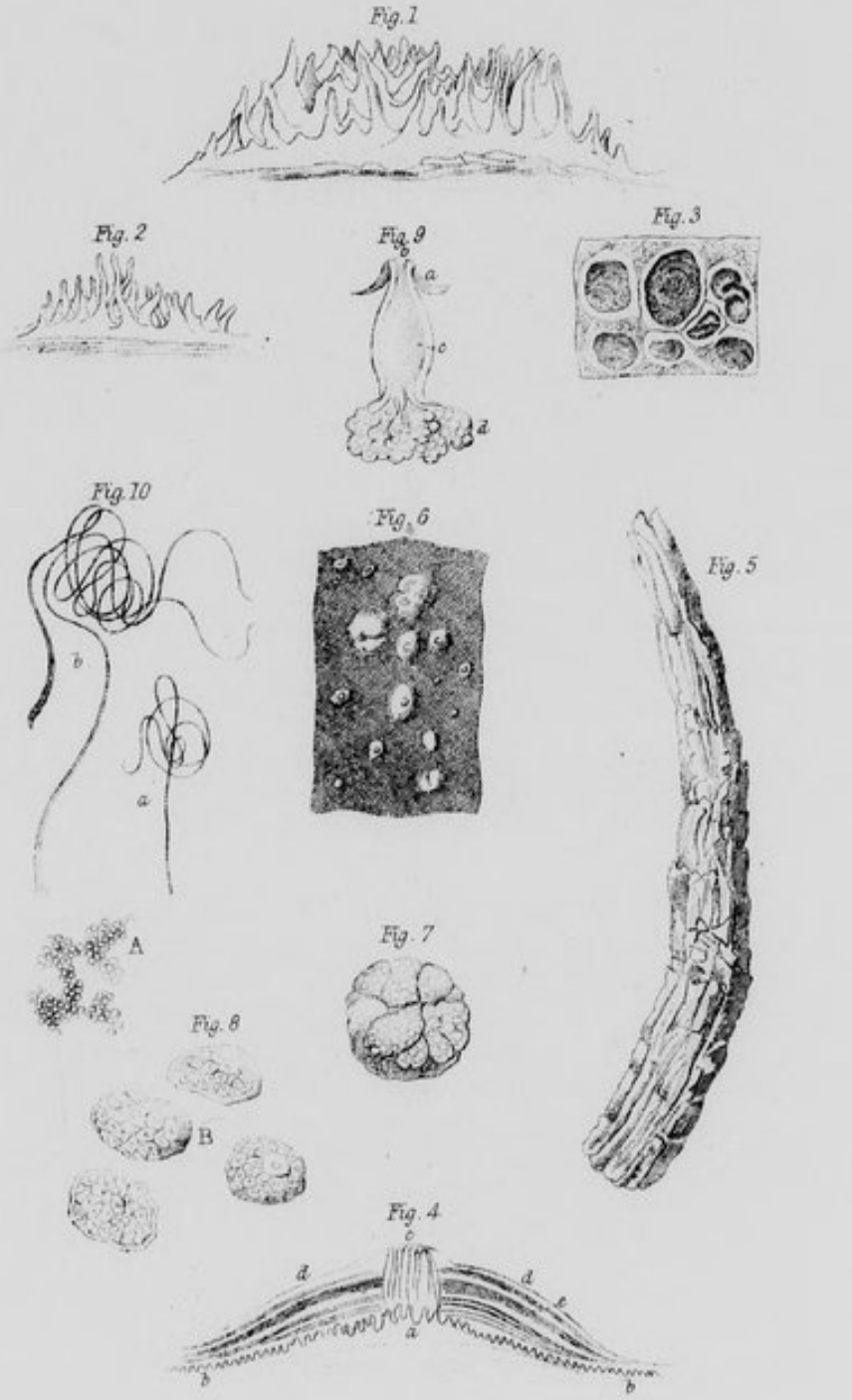
Plate 7.

ERYTHEMATOUS OR EXANTHEMATOUS ERUPTIONS.

URTICARIA. ROSEOLA. ERYTHEMA.

A. B. C. D. represent the typical appearances of Urticaria (page 153); the particular cases for illustration being selected from the varieties—evanida, conferta, and febrilis.

PLATE 6.



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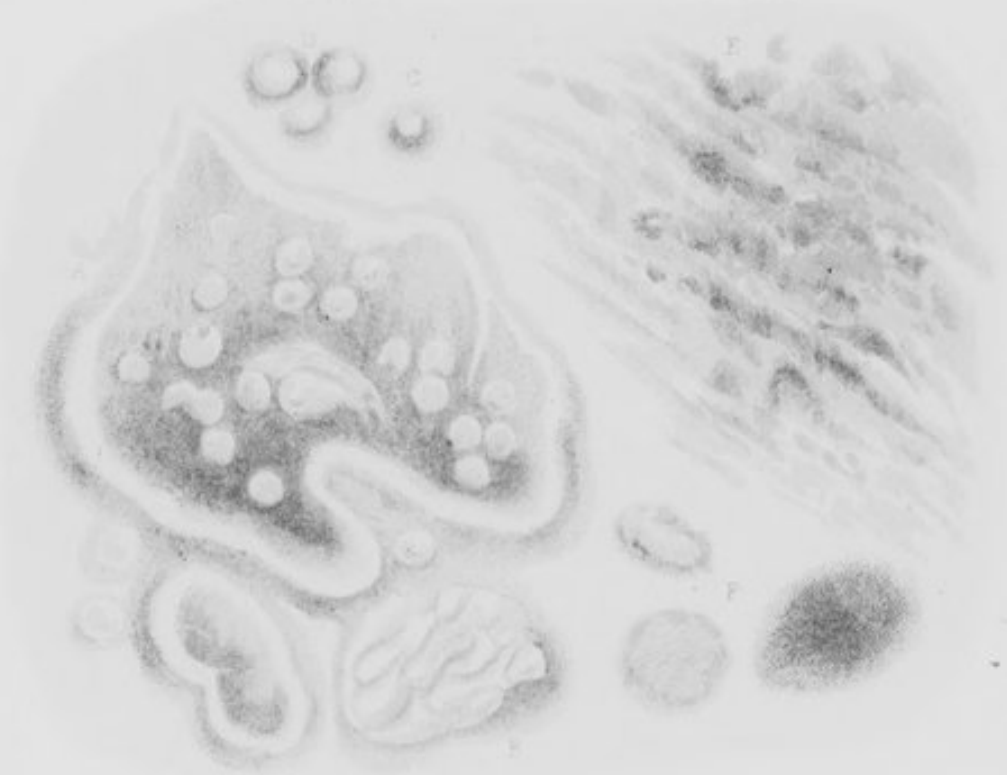
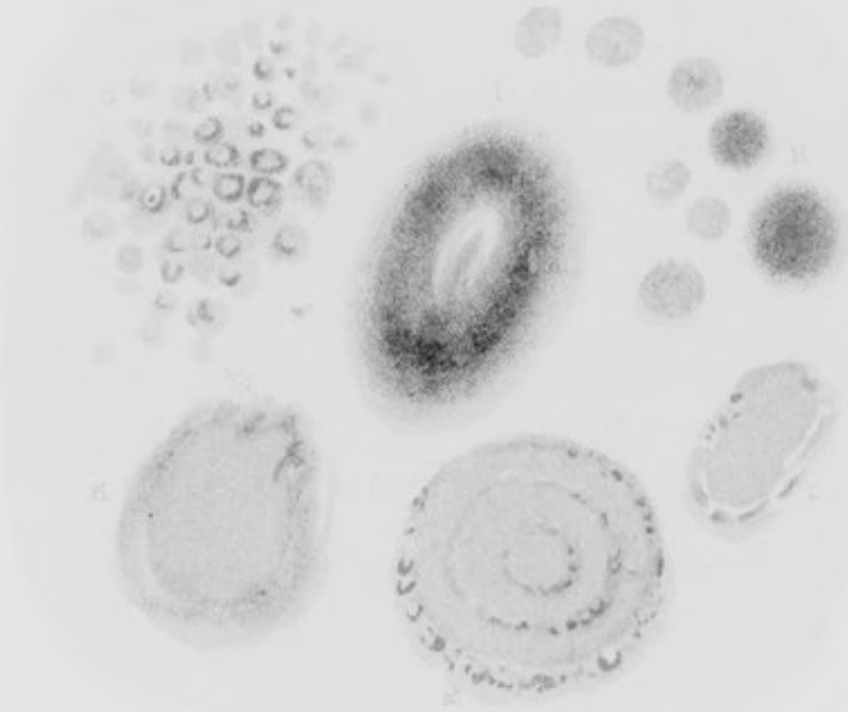




A. A. URTICARIA EVANIDA (page 155). The subject of this eruption was a little girl, six years of age, and otherwise in good health. The simple round elevations and the stripe-like wheals of urticaria are both seen in this figure.

B. URTICARIA CONFERTA (page 155). In this variety the elevations or wheals are closely aggregated, and form thickly-set clusters.

C. URTICARIA FEBRILIS (page 154). A single, red, hemispheroidal wheal of this variety of the eruption.

D. A small group of the pale hemispheroidal wheals of chronic urticaria.

ROSEOLA.

E. F. represent typical appearances of Roseola (page 144); the cases for illustration being selected from those forms of the efflorescence which are met with in adults, namely, Roseola æstiva and Roseola autumnalis.

E. ROSEOLA ÆSTIVA, or False Measles (page 145). The same character of efflorescence occurring in an infant would be termed Roseola infantilis.

F. Roseolous patches of an irregular, annular, and circular figure. These varied appearances generally occur in a chronic form of the disease, and usually belong to the variety "autumnalis." The annulate form, if its dimensions were increased, would represent Roseola annulata (page 146).

ERYTHEMA.

G. ERYTHEMA PAPULATUM (page 122). The patch was developed on the convexity of the elbow. The case is reported at page 129.

H. ERYTHEMA TUBEROSUM (page 122). The drawing was made from the leg of a young woman suffering under this disease. Two of the spots are at their height, the others are fading. The case is reported at page 130.

I. ERYTHEMA NODOSUM (page 122). The case from which this drawing was obtained is reported at page 130.

K. ERYTHEMA CIRCINATUM (page 118). The border of the ring is broad and smooth, and very little raised above the level of the surrounding surface. The area is yellowish, from the subsidence of congestion.

L. M. LICHEN ANNULATUS SOLITARIUS (page 165). The margin is prominent and papular, the area yellow, from subsidence of congestion.

PLATE 8.

BULLOUS AND RUPIAL ERUPTIONS.

PEMPHIGUS. RUPIA.

A. Circular erythematous spots, which precede the formation of the bullæ of Pemphigus (page 235).

B. A bulla of Pemphigus filled with a transparent fluid.

C. A bulla in which the fluid is whitish and opalescent.

D. A partially collapsed bulla, out of which a drop of serum is seen issuing.

E. A partially collapsed bulla filled with sanguineous fluid.

F. The thin, corrugated, brownish scab, formed by the desiccation of the bulla.

G. The appearance left upon the skin by the removal of the scab.

H. The stains left upon the skin some weeks after the fall of the scab.

I. A group of the smaller bullæ of Pemphigus, assuming a circular arrangement; Pemphigus annulatus (page 237).

RUPIA.

K. Erythematous spots on the skin, which precede the formation of the bullæ of Rupia (page 400).
L. Small bullæ, distended and collapsed.
M. RUPIA SIMPLEX. A small bulla converted into a scab.
N. A larger scab of rupia simplex. It is thick, hard, and corrugated.
O. RUPIA PROMINENS (page 400). A well-formed and characteristic scab.
P. The unhealthy ulcer left by Rupia prominens. This figure and the large conical crust, were drawn from the same patient.
Q. A depressed mark left on the skin after the fall of the scab of Rupia simplex.
R. The papular and pustular origin of rupia.
S. The appearance of the integument in a case of rupia, in which the skin was permitted to heal previously to the removal of the crusts.

PLATE 9.

HERPETIC AND ECZEMATOUS ERUPTIONS.

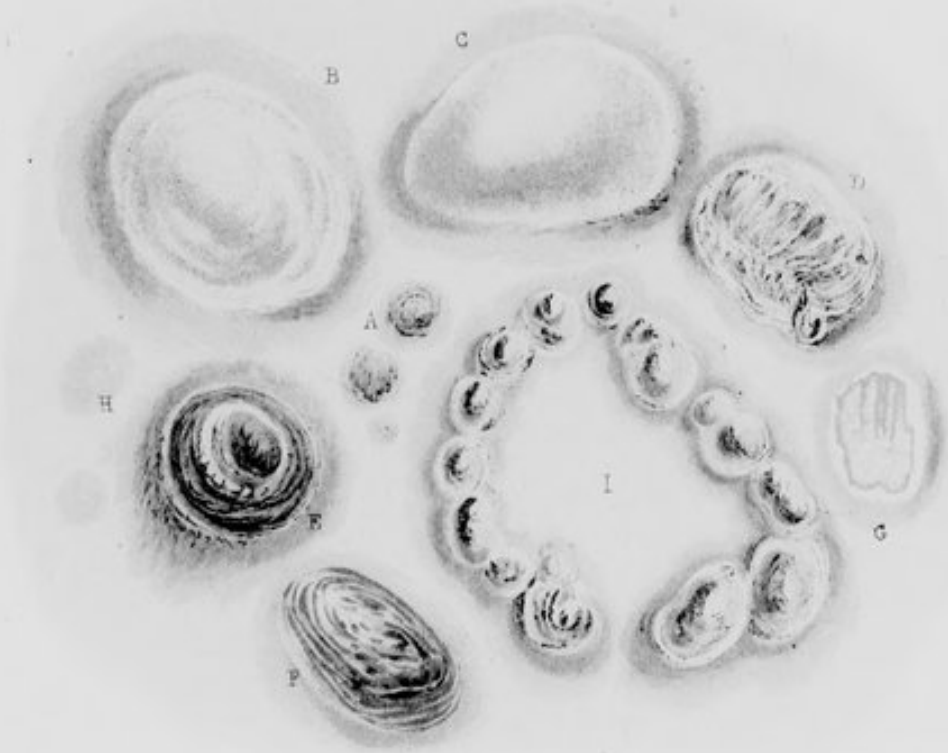
HERPES. ECZEMA.

A. HERPES ZOSTER (page 228). A patch of this eruption on its first appearance. The vesicles have not yet attained their complete size.
B. Another patch of Herpes zoster, three or four days later, when the vesicles have attained their full size; some have coalesced, and their contents become yellow. This cluster illustrates the irregular patches of HERPES PHLYCTENODES (page 225).
C. Groups of vesicles exhibiting the first stage of collapse, when a central depression is formed, and the vesicle is consequently umbilicated.
D. E. In a stage further advanced, the depressed centre of the vesicle dries up into a small scab, which is surrounded as by a rim, with the remains of the vesicle. The eruption now acquires a purplish hue.
F. Still later, nothing remains of the eruption but a small brown shrivelled crust; except in instances where ulceration takes place.
G. HERPES CIRCINATUS vel ANNULATUS (page 230). A small cluster of vesicles assuming the circular or circinate form.
H. HERPES IRIS (page 230). This is a rare and curious form of herpetic eruption.

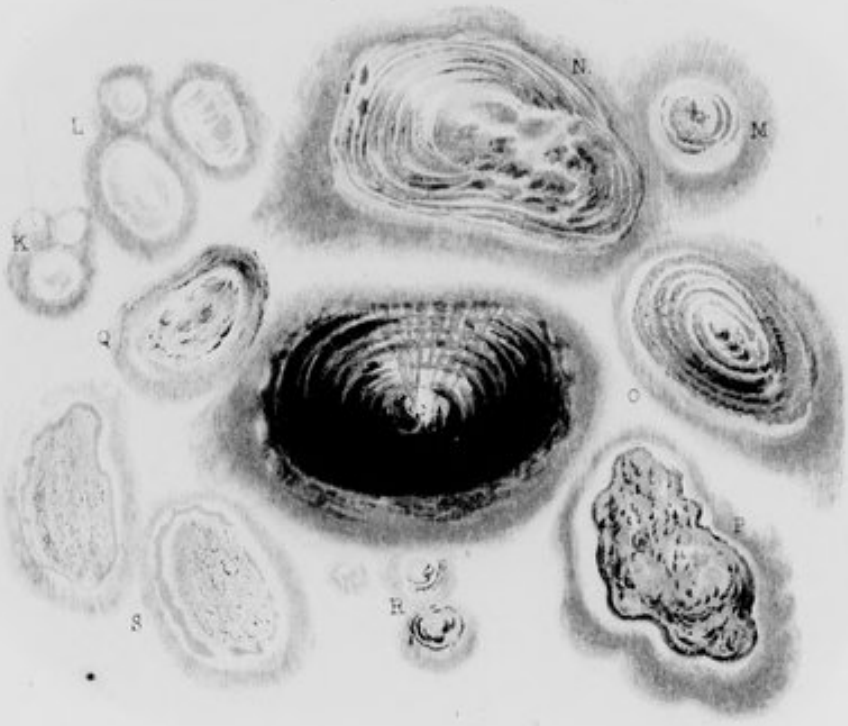
ECZEMA.

I. I. ECZEMA SIMPLEX; Eczema vesiculosum, Hebra (page 185). The vesicles are minute, and raised on a surface but little deeper in tint than the surrounding skin.
K. K. ECZEMA RUBRUM (page 185). The vesicles are the same as in eczema simplex, but the skin is red and inflamed.
L. L. ECZEMA IMPETIGINODES (page 188). The diseased surface is covered with broken crusts, between which the skin is seen to be highly inflamed (eczeme fendillé), while large drops of ichorous fluid (eczema madidans) are oozing from the exposed surface. To the left of the crusts are numerous sero-pustules, and in the right-hand corner (M), the eruption is less highly inflamed, and may be supposed to be passing into the stage of ECZEMA CHRONICUM.

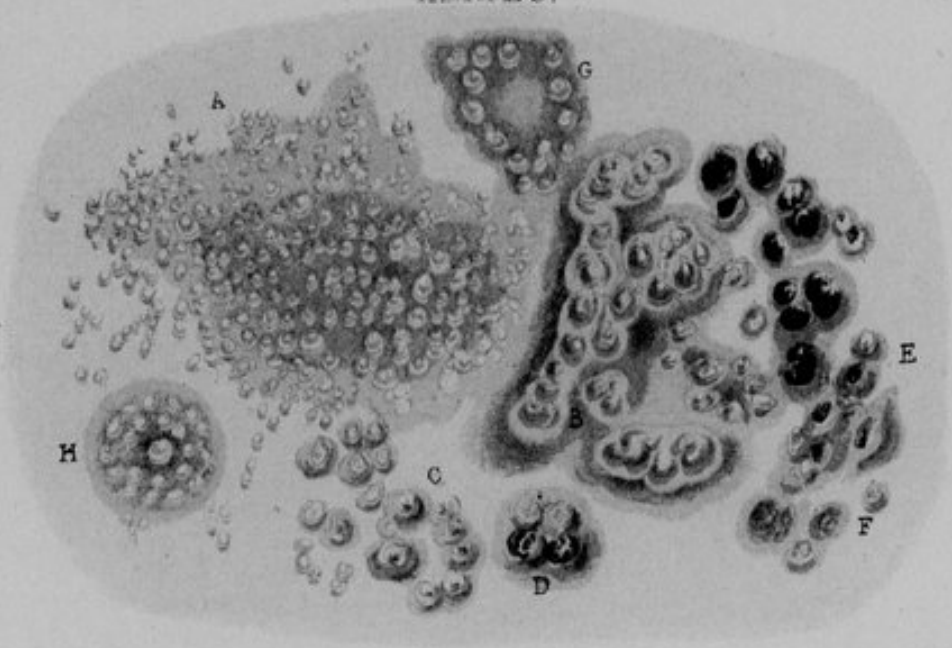
PEMPHIGUS.



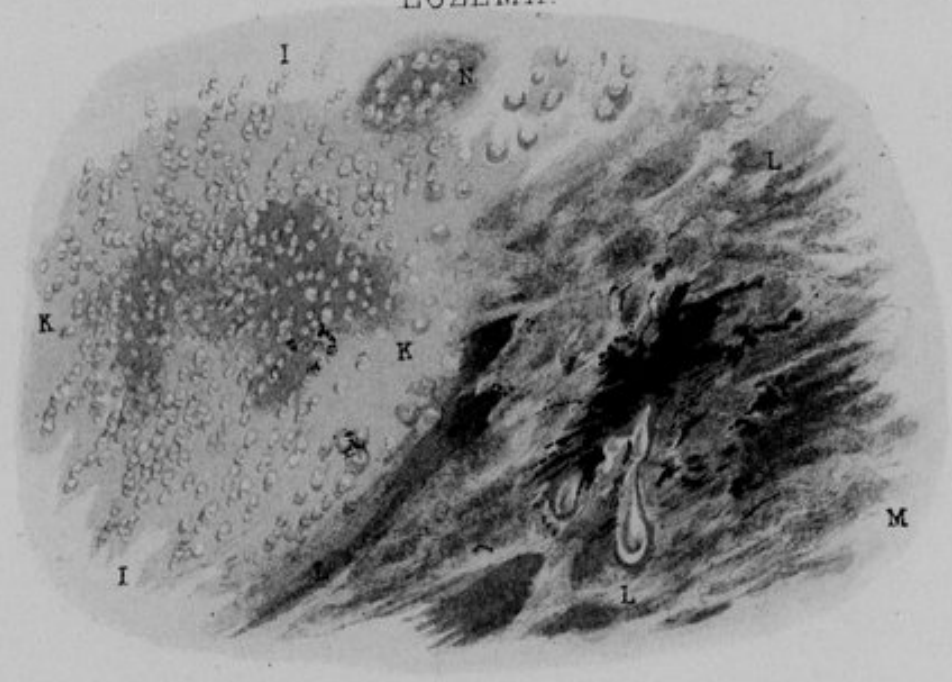
RUPIA.



HERPES.



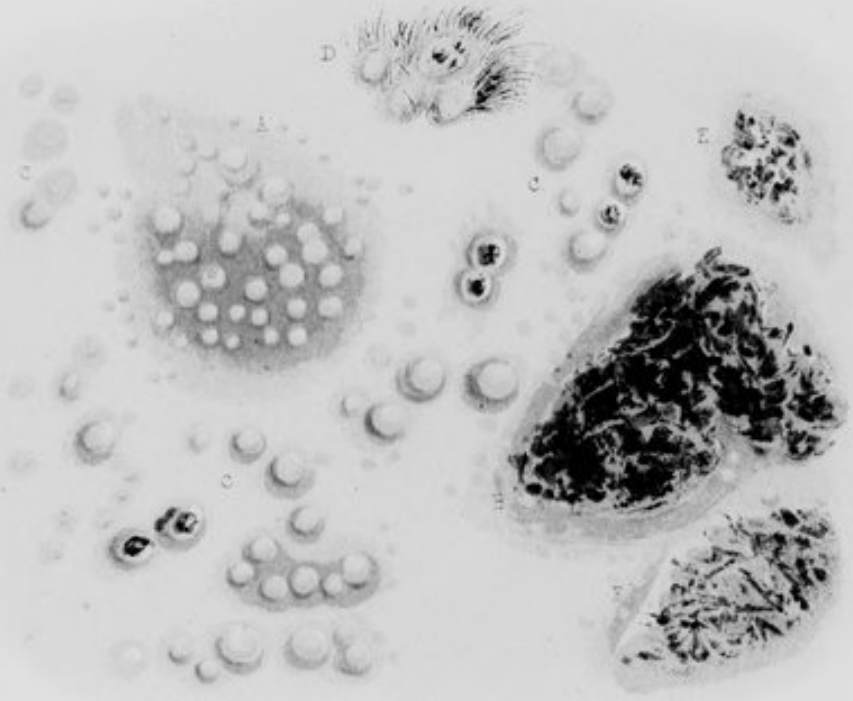
ECZEMA.



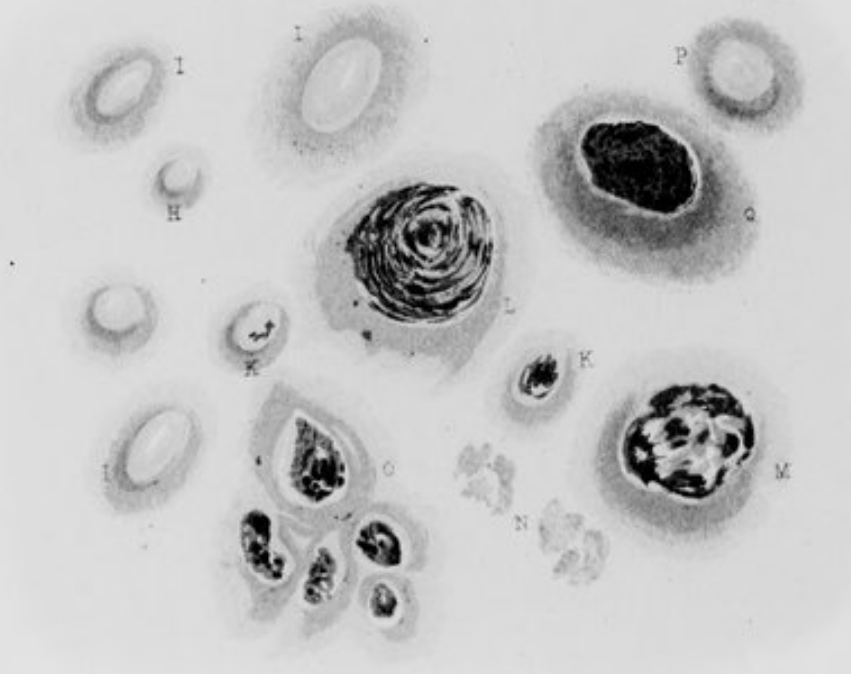
A. Bigot, del.

T. Sinclair's lith. Phil.ª

IMPETIGO



ECTHYMA



A. Bulot. Del.

T. Sandars Lith. Pall.

As Eczema not unfrequently presents, upon the same person, and at the same time, all the stages illustrated in this engraving, with the exception of Eczema chronicum, the figure may be regarded as exhibiting a complete picture of the disease.

N. A small cluster of vesicles of eczema, somewhat larger than usual, and presenting a circular arrangement very like that of herpes iris. This appearance is by no means uncommon.

Plate 10.

IMPETIGINOUS OR PUSTULAR ERUPTIONS.

IMPETIGO. ECTHYMA.

A. Impetigo figurata (page 213). A small patch of this eruption; incipient pustules are seen around its circumference.

B. Another patch of the same eruption, in its crusted state; also exhibiting incipient pustules around its border.

C. Impetigo sparsa (page 215). The pustules dispersed irregularly over the surface, singly and in small clusters, belong to this variety. The pustules are seen at every stage of progress, namely, red points; minute pustules; ripe pustules, surrounded by a halo of redness; fading pustules, collapsed and wrinkled; and others further advanced surmounted with a scab.

D. Impetigo sparsa of the scalp. The pustules are oval in shape; one of them being covered by a newly-formed crust.

E. Another crust of this eruption, from the scalp.

F. Impetigo scabida (page 215). The extremity of a crust of this disease that covered the greater part of the fore-arm of a child. Some incipient pustules around its border indicate the nature of the eruption.

ECTHYMA.

G. Ecthyma (page 220), in its several stages of pustule, scab, ulcer, and fading spot.

H. An incipient pustule.

I. I. Perfect pustules.

K. K. Umbilication and incipient desiccation of the pustule.

L. A perfected scab.

M. Ulcerated state of the skin brought into view on the separation of the scab.

N. The discolored mark which remains upon the skin after the healing of the pustule.

O. A cluster of pustules in their scabbed or crusted state.

P. A fully distended pustule from an elderly person; the purple hue of the areola is characteristic of the Ecthyma luridum of Willan; page 221.

Q. A crusted pustule from the same person.

R. An ecthymatous pustule from the back of the hand of a boy affected with scabies; the complication of scabies with such a pustule constitutes the scabies purulenta of Willan (page 265).

Plate 11.

LICHENOUS OR PAPULOUS ERUPTIONS.

LICHEN. STROPHULUS. PRURIGO.

A. Lichen simplex (page 164). A cluster of the papulæ of this eruption, from the arm. They exhibit various degrees of inflammatory activity; those in the upper part and around the circumference of the cluster being very little deeper in tint than the surrounding skin.

B. Lichen pilaris (page 165). A small cluster of the papulæ of lichen simplex developed at the apertures of hair-follicles, so as to involve the hairs. The figure was drawn from the leg of the same patient as A.

C. Lichen syphiliticus (page 388). Four clusters of the larger and duller papulæ of this eruption; from the breast.

D. Lichen urticatus (page 167). The large papulæ of this eruption; three of the pimples are surmounted with small crusts. This figure was drawn from the leg of the little patient reported at page 167.

E. Lichen circumscriptus (page 166). A patch of this eruption at an early stage, before the centre begins to subside and the margin to extend.

F. Lichen circumscriptus, in a more advanced state.

G. Lichen agrius (page 170). The white specks on the surface of the patch are furfuraceous scales. These and small oozing points are characteristic of this form of eruption.

H. H. Lichen agrius, in its chronic and crusted state. The isolated papulæ around the margin of the patch are an important diagnostic sign.

It would be more correct to regard G and H as the chronic stage of eczema (eczema papulosum, Hebra).

STROPHULUS.

I. Strophulus intertinctus (page 174). From the cheek of an infant. Towards the centre of the patch the eruption puts on the character of strophulus confertus.

K. Strophulus volaticus (page 175).

L. Strophulus albidus (page 176).

M. Strophulus candidus (page 176).

PRURIGO.

N. Prurigo (page 177). The papulæ of the three varieties of this disorder. Some of the pimples are bleeding, from fresh abrasion; while others are covered with a small black crust. Intermingled with the papulæ are the brownish-yellow stains which this eruption leaves behind it. I have not attempted to give the specific appearance of the skin, as nothing but a magnified drawing would do justice to the subject.

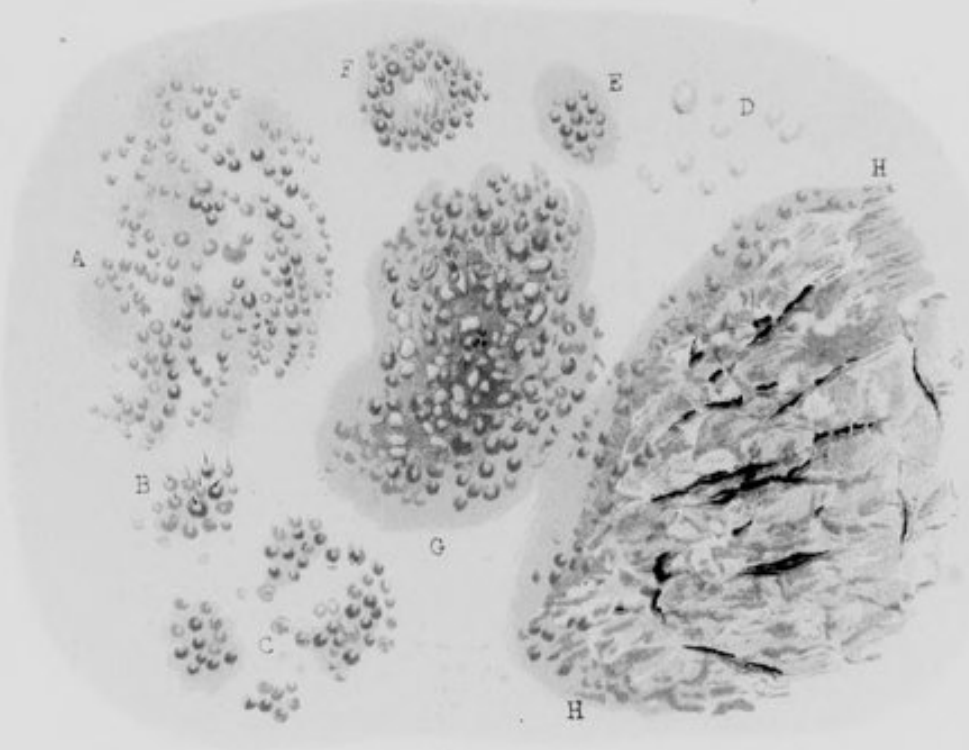
Plate 12.

LEPRA.

PSORIASIS according to HEBRA.

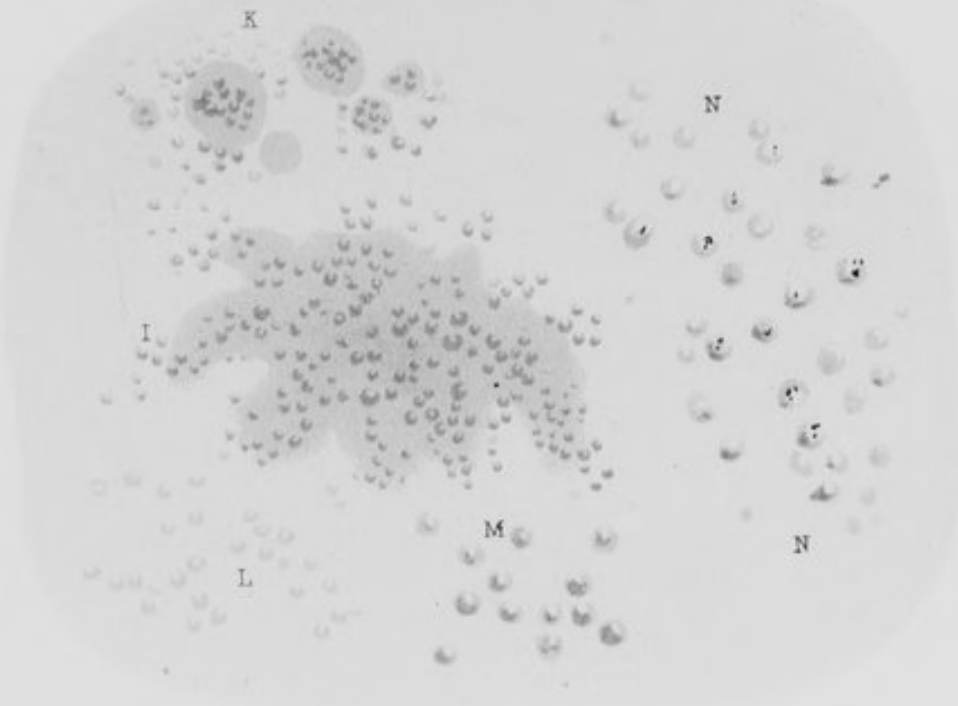
A. Lepra circinata vulgaris (page 305), a well-marked laminated and imbricated scale of the eruption.

LICHEN.

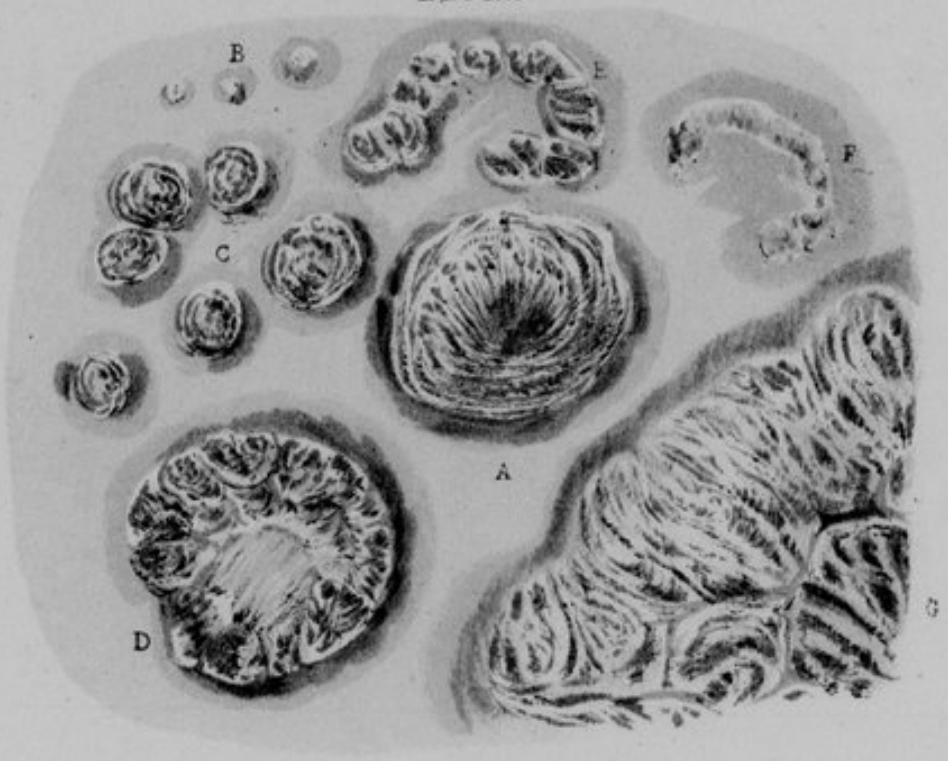


STROPHULUS

PRURIGO



LEPRA



PITYRIASIS

PSORIASIS

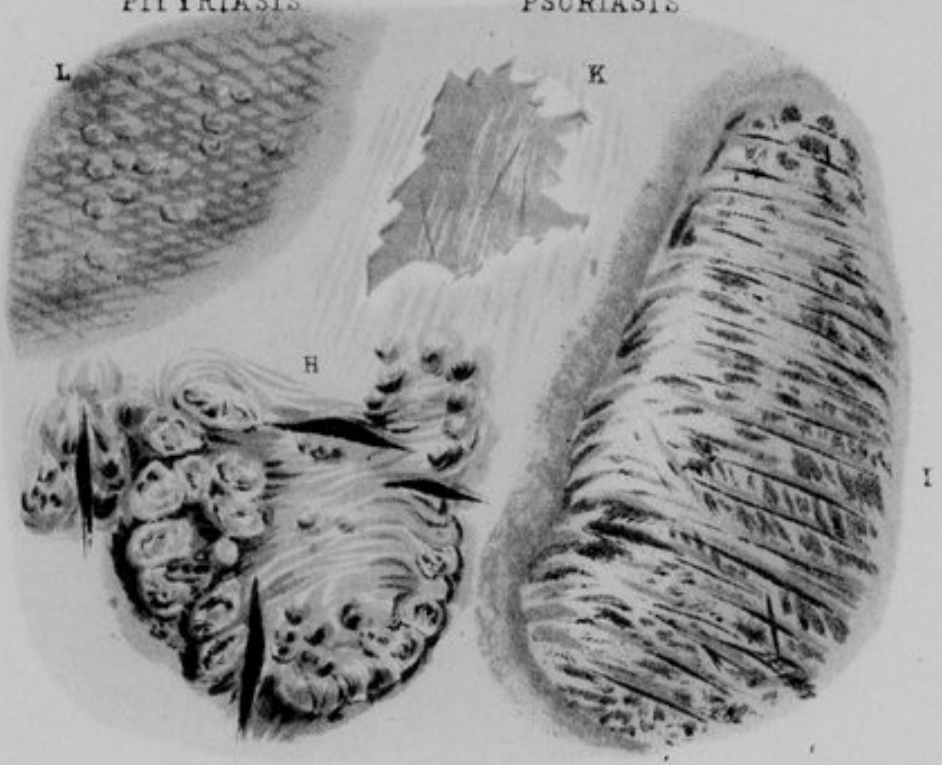


PLATE XIII.

LUPUS NON EXEDENS.

A. Bigot Del.

T. Sinclair's Lith. Phil.ª

B. The little red pimples or tubercles by which lepra commences. The tubercle to the right is already surmounted by a scale. These tubercles continue to enlarge until they attain the size of A.

C. LEPRA ALPHOIDES vel GUTTATA (page 304), that is, spots of lepra which remain stationary when they have reached to about the size of the patches represented in the figure. They are but little or not at all depressed in the centre, and hence have a whiter aspect than the larger patches of lepra vulgaris.

D. A patch of lepra vulgaris, clearing in the centre, while the scales which cover its margin are breaking up. This is the first step towards cure.

E. Another patch in which the centre is cleared to a greater extent, and a part of the margin has also subsided. This is a further advance towards cure.

F. Another patch, exhibiting a more advanced stage of the curative movement.

G. Lepra vulgaris, as it affects the convexity of the elbow; the drawing is made from the same patient as A. In this situation the patches are generally confluent, and lose their circular form.

H. LEPRA DIFFUSA (p. 306), with deep chaps on the morbid skin. The drawing was made from a patch situated on the back of the hand.

I. This figure, if the patch were no larger than represented in the drawing, would be an illustration of lepra diffusa; if, however, it extended over a considerable portion of a limb, it would be termed LEPRA INVETERATA. It is intended to illustrate the latter disease.

K. PSORIASIS PALMARIS SYPHILITICUS (page 405). The irregular margin of thickened epidermis and the chaps are characteristic. This is clearly an erythema.

L. A portion of a patch of chronic eczema (eczema furfuraceum vel squamosum, Hebra), in its dry state, from the nape of the neck. The disease covered the whole of the back of the neck, the scalp, the chest, and the shoulders.

PLATE 13.

LUPUS NON EXEDENS.

An example of this obstinate disease which has existed for thirty-three years. The patient has only lately come under my care.

The tuberculated and salmon-colored margin of the patch, its variegated area streaked with white and cicatrix-looking lines, and the erosion of the border of the ala nasi, are characteristic of this disease (page 317).

PLATE 14.

DISEASES OF THE SEBIPAROUS FOLLICLES, HAIR-FOLLICLES, AND HAIRS.

ACNE. SYCOSIS. FAVUS. TRICHOSIS.

A. ACNE VULGARIS PUNCTATA (page 594). Several groups of the pimples of this eruption, in their early state. They are characterized by the black point which is perceived in the centre of each.

B. Acne punctata in a more advanced stage; they are now becoming slightly inflamed.

C. COMEDONES (page 571). These black spots on the skin, caused by inspissation of the sebaceous substance and discolorarion of the external end of the small piles so produced, generally accompany the development of acne. They frequently precede the form A, the pimples of acne punctata being comedones, with elevation and induration of the skin immediately around their apertures.

D. ACNE VULGARIS (page 594). Conical elevations with inflamed bases, and suppurating at the summit.

E. Stains, pits, and scars left on the skin by acne vulgaris.

F. A pimple of acne vulgaris, on the summit of which the pustule is in progress of desiccation into a scab.

G. ACNE VULGARIS INDURATA (page 595). This is a chronic variety, and consequently the pimples are less vividly inflamed than those of D, F.

H. ACNE ROSACEA (page 595). The drawing was made from a patch on the cheek of a gentleman of middle age.

SYCOSIS.

I. SYCOSIS (page 634). A patch of this eruption, from the side of the chin of a young man of twenty-five.

TRICHOSIS.

K. K. TRICHOSIS FURFURACEA, or ringworm (page 617). Patches of common ringworm, in its papular form; trichosis furfuracea papulosa.

L. Separate papulæ of the same disease, produced by the affection of isolated follicles.

M. Trichosis furfuracea, in its crusted form; the crust being constituted of flakes of epidermis and towy hairs matted together by a small quantity of serous discharge. The crust is broken into angular compartments by the movements of the scalp.

N. A magnified section, showing a pimple of this disease, together with two hairs issuing from its summit; the latter being inclosed for a short distance by a sheath of inspissated sebaceous substance.

O. A magnified hair, showing the state of disease which exists in that structure in trichosis furfuracea. *a*. The root of the hair. *b*. Its shaft. *c*. The external or cortical layer of the hair broken from its continuity with *b*, and stripped back, so as to expose its internal surface. Several of the granules of the diseased hair are adherent to the surface of this layer. *d*. The granular layer of the hair surrounding its fibrous central part.

P. The appearance presented by the granules when viewed with the microscope.

Q. A group of granules more highly magnified. Each granule is seen to possess a nucleus.

FAVUS.

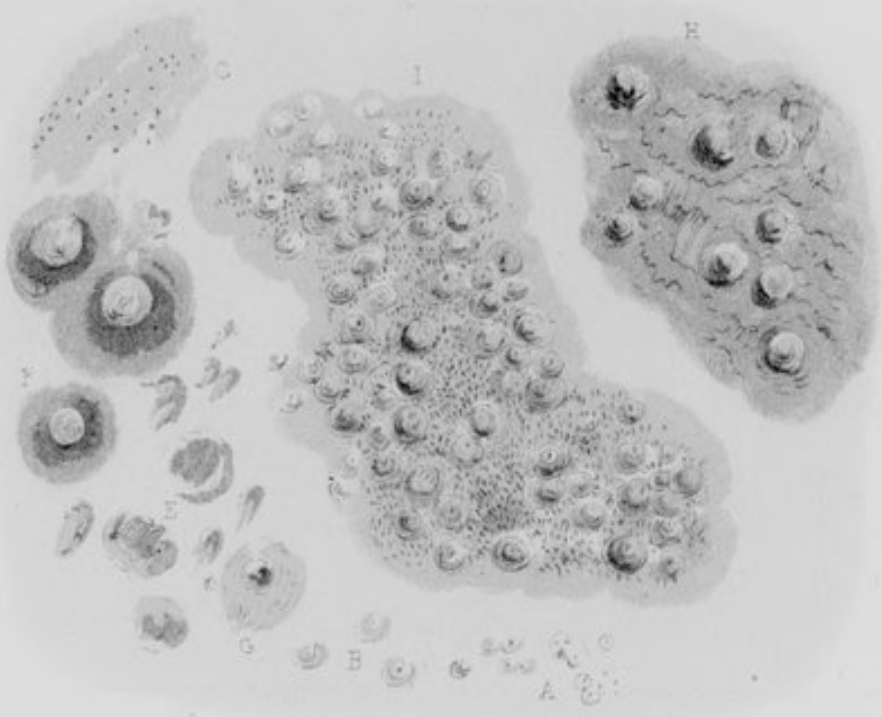
R. FAVUS DISPERSUS (page 637). The saucer-shaped, bright yellow crusts of this disease. Each crust is pierced by one or more hairs.

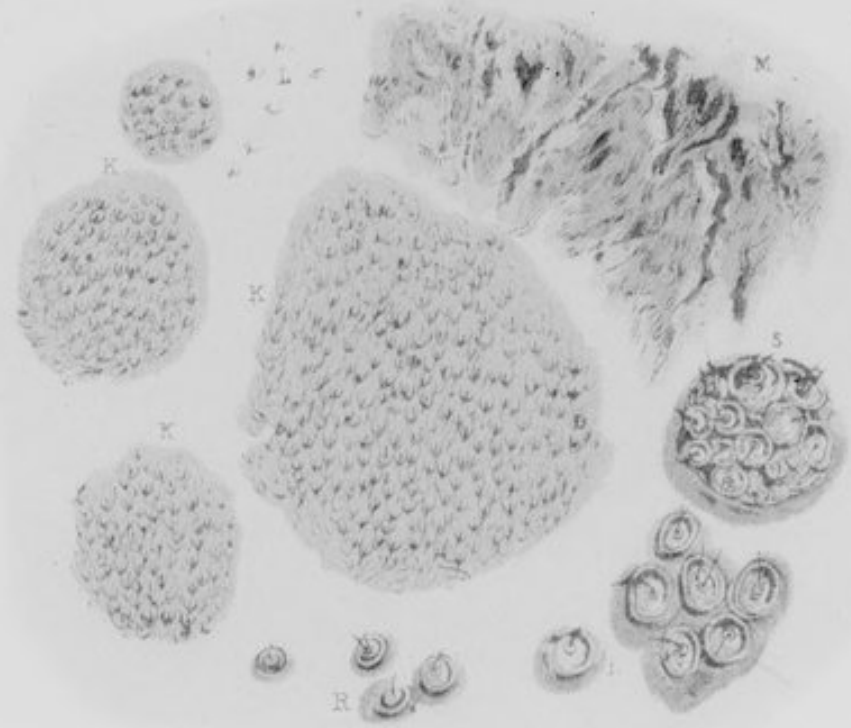
S. FAVUS CONFERTUS (page 637). The yellow saucer-like crusts of the aggregated form of the disease are clustered together so closely as to constitute a more or less coalescent mass.

T. A diagram section of the crust of favus, which is intended to show the insertion of the base of the crust into the hair-follicle, and its relation to the hairs.

ACNE.

SYCOSIS.





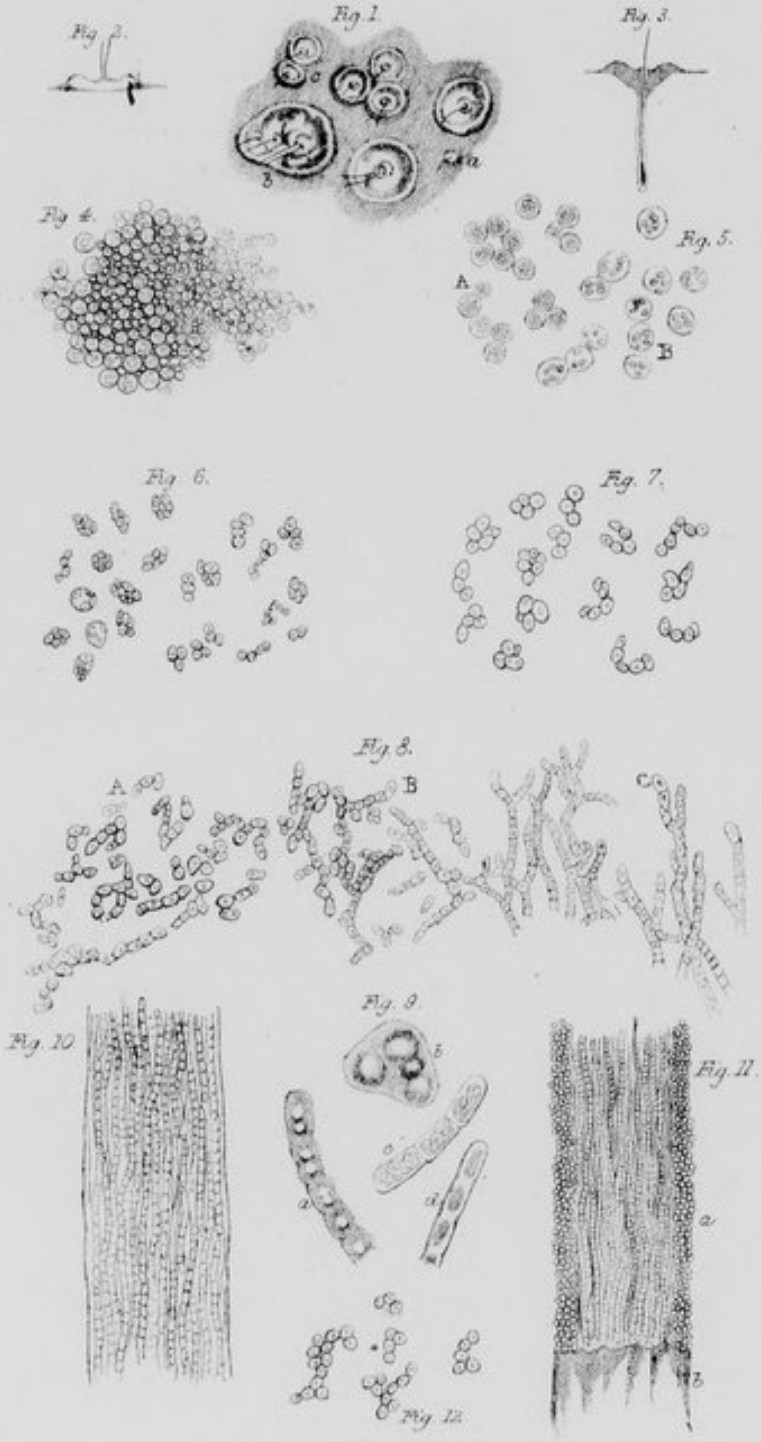
TRICHOSIS.

FAVUS.

A. Bilfour Del.

Lithog. of W. Blair

PLATE XV



T. Sinclair's lith. Phil.ª

Plate 15.

DISEASES OF THE HAIR-FOLLICLES AND HAIRS.

FAVUS. TRICHOSIS.

Fig. 1. Favus (page 637). 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 neighboring 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 inclosed 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.

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.

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.

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.

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*.

The figure is magnified 310 times.

Fig. 9. Diagrams representing some of the appearances of the favous formation during its growth.

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.

Fig. 11. Trichosis furfuracea (page 617). A diseased hair from a patch of common ringworm, magnified 155 times.
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.

Plate 16.

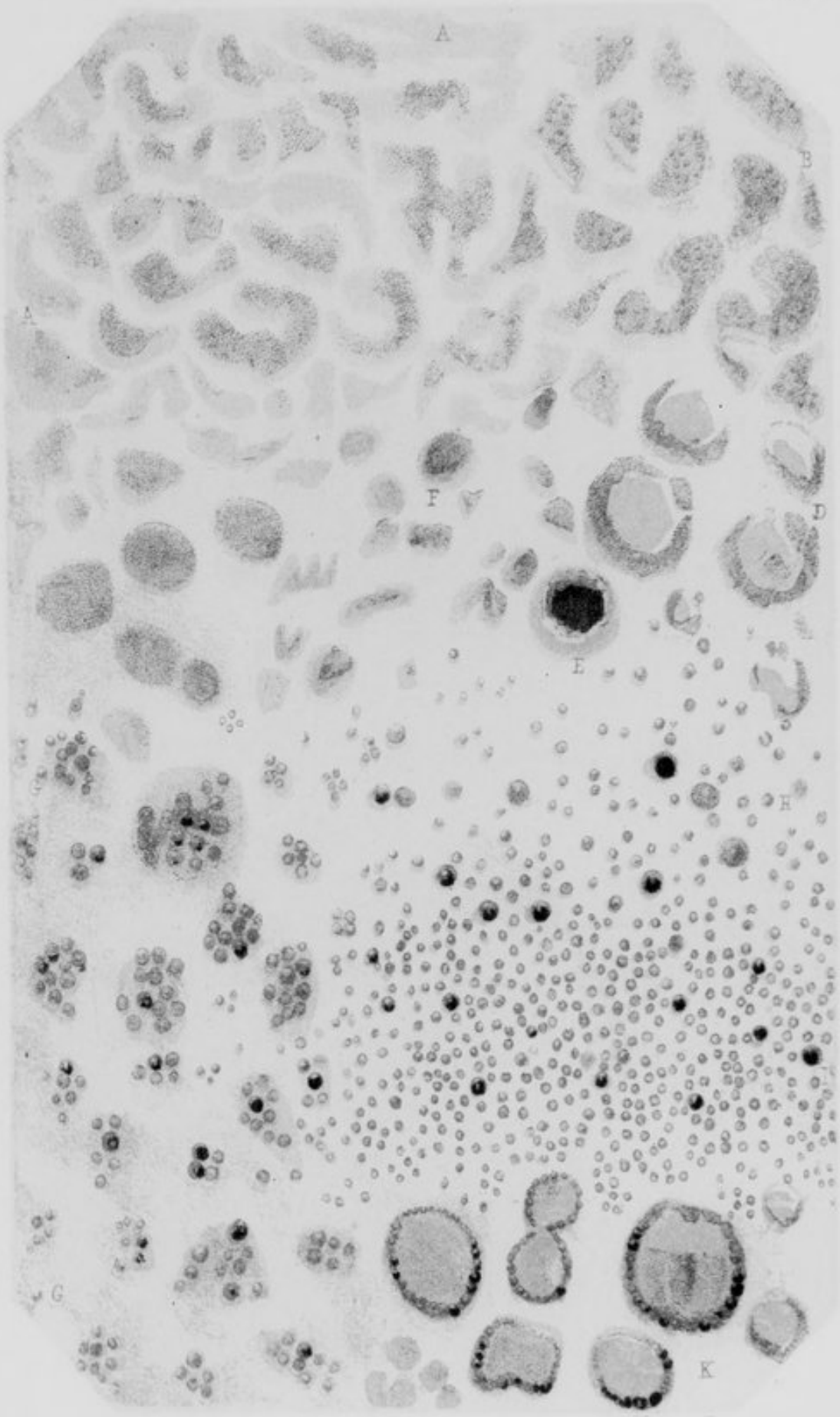
EXANTHEMATOUS AND PAPULAR SYPHILITIC ERUPTIONS.

A A. Roseola versicolor vel vulgaris. (See p. 387.)
B. Roseola punctata. (See p. 387.)
C. Roseola orbicularis. (See p. 387.)
D. Roseola annulata. (See p. 387.)
E. A blotch of roseola orbicularis, from which the epiderma has peeled off and forms a white frill around its circumference. The color of the blotch is intended to show the true "copper color."
F. Roseolous blotches in process of fading, and passing away as brownish stains. (See p. 387.)
G G. Lichen syphiliticus corymbosus. (See p. 388.)
H. Lichen syphiliticus disseminatus. (See p. 388.)
I. Lichen syphiliticus confertus. (See p. 388.)
K. Lichen syphiliticus annulatus. (See p. 388.)
The natural color of the eruptions has been adhered to as nearly as possible in this plate; and in several places, the color of the stains left by the declining and fading eruption is shown.

Plate 17.

TUBERCULAR SYPHILITIC ERUPTIONS.

L. Tubercula syphilitica corymbosa. (See p. 392.)
M M. Blotches of tubercula corymbosa assuming a circular and annulate form.
N N. Smaller blotches found intermingled with the preceding forms in syphiloderma tuberculatum corymbosum. These latter may be distinguished as "cupped" tubercles. All the three forms are frequently met with in the same person.
O. A small patch of tubercula circumscripta. (See p. 392.)
P. Larger patch of tubercula circumscripta. The tubercles are covered with scales formed by the exfoliation of the cuticle.
Q Q. Tubercula disseminata. (See p. 392.)
R. Tubercula disseminata, in process of exfoliation; each tubercle being surrounded at its base by a frill of cuticle. (See p. 395.)
S S. Tubercula annulata. Between the two larger rings are seen incipient rings, having the characters of "cupped" tubercles. (See p. 397.)
T. An annulate tubercle from the penis.
V V. Rings of annulate tubercle.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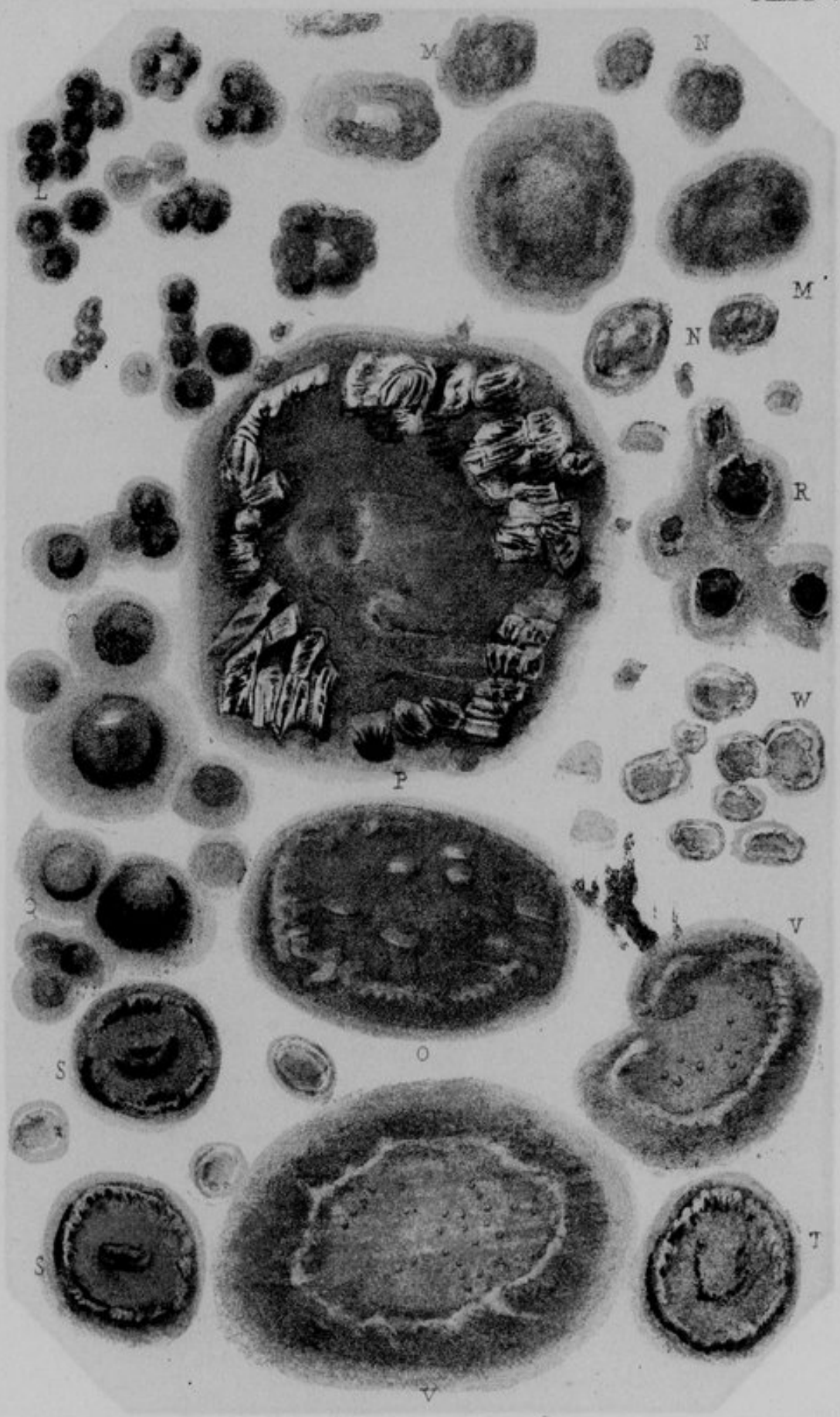
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W. Cupped tubercles; the common form of the separate eruptions in infantile syphilis.

Plate 18.

A. Patch of rupia simplex from the knee. (See p. 400.)
B. Rupia prominens; below the lower eyelid is seen one of the pustules by which rupia prominens ordinarily commences. (See p. 400.)
C. Erythema palmare syphiliticum. (See p. 405.)
D. Erythema palmare annulatum centrifugum. (See p. 405.)
E. Aphthous exfoliation and syphilitic tubercles of the tongue.

Plate 19.

A. Ulcera syphilitica; the figure represents the hand of the patient, and the state of distortion occasioned by syphilis. (See p. 407.)
B. Hereditary syphiloderma of the nose.
C. Erythematous syphiloderma of the nose.
D. Syphiloderma lupoides, or lupus non exedens. (See p. 414.)
E. Syphiloderma lupoides. (See p. 414.)

Plate 20.

DISEASES OF THE SEBIPAROUS ORGANS.

Fig. 1. Stearrhœa nigricans (page 627), affecting the skin of the lower eyelid, and adjacent part of the nose.
Fig. 2. Laminæ flavæ epithelii cutis, planæ (page 555). Vitiligoidea plana of Dr. Gull.
Fig. 3. Laminæ flavæ epithelii cutis, papulosæ (page 555). Vitiligoidea granulosa, of Dr. Gull.

Fig 2.

Fig 1.

Fig 3.

T. Sinclair's lith. Phila.

DISEASES OF THE SKIN.

CHAPTER I.

ANATOMY AND PHYSIOLOGY OF THE SKIN.

THE skin is the exterior investment of the body, which it serves to cover and protect. It is continuous at the apertures of the internal cavities with the lining membrane of those cavities—the internal skin, or mucous membrane; and is composed essentially of two layers, the derma and epidermis.

The derma, cutis, or true skin (Plate II.), is chiefly composed of areolo-fibrous tissue; besides which it has entering into its structure elastic tissue and smooth muscular fibre, together with bloodvessels, lymphatic vessels, and nerves. The areolo-fibrous tissue exists, in its most characteristic form, in the deeper strata of the derma, which are consequently dense, white and coarse, while the superficial stratum is fine in texture, reddish in color, soft, raised into minute papillæ, and endowed with an abundant supply of vessels and nerves. This peculiarity of structure of the derma has given rise to its consideration as consisting of two layers, the superficial or papillary layer, and the deep stratum or corium.

The epidermis, cuticle, scarfskin, or scurfskin (Plate I.) is a product of the derma, which it serves to envelop and defend. That surface of the epidermis which is exposed to the influence of the atmosphere and exterior sources of injury, is hard and horny in texture; while that which lies in contact with the sensitive papillary layer of the derma is soft, and composed of newly-formed cells. Hence this membrane, like the derma, offers two strata for our observation, the outermost stratum, commonly spoken of as the epidermis, and the innermost stratum, or rete mucosum. The latter was considered and described by Malpighi as a distinct membrane, and is frequently referred to under the name of rete Malpighianum.

Besides the derma and epidermis, the skin includes certain important secreting organs, and certain appendages, which call for separate notice. The secreting organs are the sudoriparous and sebiparous glands; and the appendages, the hairs and the nails.

The DERMA presents considerable variety in degree of thickness in

different parts of the body. Upon the more exposed regions, as the back, the outer sides of the limbs, and the palms[1] and soles, it is remarkable for its thickness; while on protected parts, as the inner sides of the limbs, and the ventral surface of the trunk, it is comparatively thin. On the eyelids, the penis, and the scrotum, again, it is peculiarly delicate. The papillary layer also presents differences in extent of development; on the palms of the hands, the pulps of the fingers, and the soles of the feet, this layer is thick, and the papillæ numerous and of great length, while in most other situations it is thin, and the papillæ are little apparent. Some contrariety is observed, besides, in the relative proportion of the layers of the derma; for on the back, where the corium is exceedingly thick, the papillary layer is but slightly developed, while on the pulps of the fingers, where the latter is strikingly manifest, the corium is thin.

The areolo-fibrous tissue of the derma is constructed of fibres of two kinds, namely, of minute cylindrical fibres, which are identical in their nature with the delicate wavy fibres of common areolar or cellular substance, and of fibres of elastic tissue, presenting their characteristically curved ends, and branching and anastomosing distribution. In the superficial strata of the corium, the white fibres are collected into small fasciculi, and form an intricate interlacement, which supports the papillæ, and constitutes a nidus for the capillary rete of vessels and terminal plexus of nerves. In the middle strata, the fasciculi are larger and flattened, and the areolar network coarse; while in the deep layer (pars reticularis—Plate II., fig. 3) the fasciculi are broad—namely, about a line in diameter, and the areolar spaces two lines in width. These latter are occupied by small masses of adipose tissue, while the fasciculi are continuous with the subcutaneous cellular membrane. The yellow elastic fibres are solitary in their arrangement; they are abundant in the superficial layers of the corium, but rare and scantily met with in the deeper strata. The areolæ left by the interlacement of the fasciculi of the areolo-fibrous tissue, are the channels by which branches of vessels and nerves find a safe passage to the papillary layer, wherein, and in the superficial strata of the corium, they are principally distributed.

The smooth or unstriped muscular fibre of the derma is distributed most abundantly in the deep stratum of the corium, within the spaces which give passage to the hair follicles, and especially, in the areola of the nipple and in the dartos of the scrotum. These fibres are simple homogeneous filaments, smaller than those of muscular fibre of animal life; they are flat and smooth, possess no transverse striæ, and have a reddish hue. They are fusiform in shape, of variable length, and are composed of a thin external membrane, blended with and inclosing a soft and finely granular contained substance. The shorter fibres have a central nucleus; the longer ones a succession of nuclei which give to the fibre a knotted appearance; and the nuclei are sometimes oval and sometimes elongated or columnar. The fibres are united into fasciculi by an adhesive interstitial substance; and the fasciculi,

[1] In the palm of the hand the derma measured three-fourths of a line in thickness.

which are sometimes round and sometimes flat, are intermingled in greater or less proportion with the fasciculi of the areolo-fibrous tissue. Kölliker found small bundles of smooth muscular tissue measuring $\frac{1}{120}$ to $\frac{1}{75}$ of an inch in connection with the hair follicles; these small bundles, which have been termed by Eylandt *arrectores pilorum*, take their origin by two or three penicillar digitations (Henle) from the upper stratum of the corium nearest the limitary membrane, and descend obliquely to the follicle of the hair, to become blended with the outermost layer of the follicle immediately below the sebiparous gland. Kölliker describes two of these muscles as appertaining to each hair follicle, but Dr. Lister[1] finds only one, and this on the sloping side of the follicle, a position "exactly that which is best adapted for erecting, as well as protruding, the hairs." These muscles are the agents of erection of the hairs, and also of that erection of the pores of the skin called *cutis anserina*, or goose-skin; it is not unlikely, moreover, that the excretion of the sebiparous glands may be assisted by the same agency. It may also be noted that these little muscles not only lift up the follicle and give a prominence to the pore, but as they take their origin at a short distance from the pore, they at the same time depress the surface of the intermediate skin; the term *spasmus peripherícus*, has been, not inaptly, therefore, applied to this state of the derma. In the areola of the mamma, the bundles of smooth muscular tissue have a circular arrangement; Dr. Lister describes them in the deepest part of the corium of the areola mammæ as a "delicate, pale, reddish yellow fasciculus, circularly arranged." Henle thought that he had seen similar muscular tissue in connection with the sudoriparous glands of the palm of the hand and sole of the foot, but this observation has not yet been verified, and is otherwise doubtful.

THE PAPILLARY LAYER OF THE DERMA (Plate II., figs. 1, 2) is raised into small prominences or prolongations, which are termed *papillæ;* the general form of these papillæ is cylindrical and conical, but some are club-shaped and slightly flattened, and others spring from a short trunk in a tuft of two, to four or five, and are termed "compound," the former being "simple" papillæ. Upon the general surface of the body the papillæ are short, and exceedingly minute, but in other situations, as on the palmar surface of the hands and fingers, and on the plantar surface of the feet and toes, they are long, of comparatively large size, and very numerous; they are also found in great abundance on the prolabium of the lips, on the nipples, on the glans penis, the glans clitoridis, and nymphæ. Weber estimates the number of papillæ in a square line of the surface of the palm of the hand at 150 to 200 simple and 81 compound papillæ. They also differ in their arrangement in the situations above cited; thus, on the general surface, they are distributed at unequal distances, singly and in groups, whereas, on the palms and soles, and on the corresponding surface of the fingers and toes, they are collected into little square clumps, containing from ten to twenty papillæ, and these little clumps are

[1] Microscopical Journal and Transactions, vol. i. 1853, p. 262.

disposed in parallel rows. It is this arrangement, in rows, that gives rise to the characteristic parallel ridges and furrows which are met with on the hands and on the feet. The papillæ, in these little square clumps, are for the most part uniform in size and length, but every here and there one papillæ may be observed which is longer than the rest. The largest papillæ of the derma are those which produce the free border of the nail; they occupy the dermal follicle of the nail, and are long and filiform. In structure the papilla is composed of homogeneous nucleated and fibrillated areolar tissue, bounded by a structureless limitary membrane, and containing either a capillary loop (*vascular papilla*) or a nerve fibre (*nervous papilla*). Modern researches[1] have shown that the papillæ of the skin are properly divisible into vascular and nervous; that in the vascular papilla a nerve is rarely found;[2] while in the nervous papilla a capillary loop is equally absent; and that those exceptional papillæ which contain both a vessel and nerve may be regarded as a result of the fusion of two papillæ of different kinds. The nuclei or endoplasts of the homogeneous areolar tissue are oval in shape, and lie with their long axis sometimes parallel with the boundary of the papilla and sometimes horizontally; and from these nuclei are thrown off rudimentary elastic fibres which give a fibrillated character to the tissue. In the nervous papillæ, Wagner has described an oval or pine-shaped mass which occupies the centre of the papilla, and has been named, from its relation to the nerve-fibre, *corpusculum tactus;* and by Kölliker, from its situation, *axile corpuscle.* The axile corpuscle is found only in the nervous papillæ, and is composed of the same homogeneous nucleated areolar tissue as the rest of the papilla, but somewhat more dense in its nature, and having its nuclei and elastic fibres disposed transversely to the axis of the corpuscle. The axile corpuscle has been compared to the Pacinian corpuscles of the cutaneous nerves of the hand, and, like the Pacinian corpuscle, has been shown by Huxley[3] to be a development of the neurilemma of the nerve-fibre; to be, in fact, the "continuation and termination" of the neurilemma of the nerve; not surrounding the cylinder of the nerve-fibre equally as in the Pacinian body, but swelling out more on one side than on the other, and extending for a greater or lesser distance beyond the end of the nerve. From the relative position of the nerve-fibre, and the mass of the corpuscle, the fibre, after breaking up into its ultimate threads, has the appearance of ramifying upon the axile body, and its ultimate fibrils are gradually lost in the tissue of the corpuscle, at a greater or less distance from its extremity. Nervous papillæ, provided with an axile corpuscle, have been principally found in the hand and fingers, on the red edges of the lip, and at the point of the tongue.

The ARTERIES OF THE DERMA, which enter its structure through the areolæ of the under surface of the corium, speedily divide into innu-

[1] Wagner; Meissner; Kölliker; Huxley.

[2] Kölliker finds nerves in the vascular papillæ of the lip.

[3] On the Structure and Relation of the Corpuscula Tactus (Tactile Corpuscles or Axile Corpuscles), and of the Pacinian Bodies. By Thomas H. Huxley, F. R. S., in the "Quarterly Journal of Microscopical Science," vol. ii. 1854.

merable intermediate vessels, which form a rich capillary plexus in the texture of the superficial stratum of the derma, and in its papillary layer. In the former situation the capillary rete is horizontal—that is, it corresponds with the plane of the surface of the skin; while in the papillæ it is necessarily the reverse of this, namely, perpendicular to the plane of the surface. To see the capillary plexus of the papillæ, it consequently becomes necessary to examine the injected skin by means of a vertical section; but if the horizontal rete is to be observed, no section is needed. In the papillæ of some parts of the derma, the capillary vessels form simple loops, but in other papillæ they are convoluted to a greater or less extent, in proportion to the size and importance of the papillæ. (Plate II., figs. 3, 5.) The capillary rete of the horizontal stratum presents, as may be inferred, a number of circular areæ, some of which appear to correspond with the bases of the papillæ, while the greater number occupy the walls of the passages through which the sudoriferous ducts and hairs make their way to the surface. After a certain extent of course, the intermediate vessels unite to form the veins by which the blood circulated in the skin returns to the system.

The LYMPHATIC VESSELS probably form in the superficial stratum of the derma, a plexus, the meshes of which are interwoven with those of the capillary and nervous plexus. No lymphatics have as yet been discovered in the papillæ, nor, indeed, can I imagine that they would perform any useful office in that situation. I once succeeded in injecting a minute lymphatic plexus in the derma of a fœtal lamb.

The NERVES OF THE DERMA, after entering the areolæ of the deeper part of the corium, divide into minute fasciculi, which form a terminal plexus in its upper stratum. This terminal plexus corresponds with the vascular rete, and from it are given off the primitive nerve-fibres, which enter the papillæ, and terminate in the axile corpuscles. The belief has long prevailed, that the distribution of the nerve-fibres in the papillæ takes place by means of loops, but more careful research throws doubt over this mode of termination. Mr. Huxley,[1] who has seen such loops in the cutaneous papillæ of fishes, observes: "I have never been able to convince myself of their presence (in man); and frequently when I believed I had such cases before my eyes, the use of a higher power, or the causing the papillæ to turn a little, would undeceive me. On the other hand, it is by no means difficult to obtain the clearest possible evidence of the occurrence of the so-called free ends." According to the same observer, the termination of the nerves takes place "by one or two pointed extremities, which appear to be continuous with the tissue of the corpuscle." As already stated, nerve-fibres are chiefly found in the non-vascular nervous papillæ, and are constantly associated with the axile corpuscle, the corpusculum tactus.

The nerves of the derma, previously to reaching the base of the corium, and while yet imbedded in the subcutaneous areolar tissue,

[1] Loc. citat.

are remarkable for the presence, on their smaller twigs, of minute, oval-shaped, glistening bodies, first described by Pacini, and thence named Pacinian corpuscles. The Pacinian corpuscles have been chiefly found in the most sensitive parts of the skin, as the palm of the hand and sole of the foot, and especially on the pulps of the fingers; and it has been calculated, that in the palm of the hand and palmar surface of the fingers there exist about six hundred of these bodies. They vary in size from half a line to three lines in length; and, clustered around the small twigs of the nerves, have very much the appearance of buds upon the branch of a tree. The Pacinian bodies are commonly described as composed of from twenty to sixty concentric layers or capsules of areolar tissue, having between them as many spaces, which contain a serous fluid, and in the centre an oval-shaped cavity, also containing fluid and the axis cylinder of a nerve-fibre denuded of its medulla and sheath, and terminating by a small round tubercle, or by a bifid or trifid extremity. Mr. Huxley, however, who confirms the analogy subsisting between the axile corpuscles and the Pacinian bodies, observes: That there are no spaces filled with fluid between the capsules; that the so-called capsules or layers are united by a transparent, granular, or fibrillated substance; that there is no central cavity, but a central solid homogeneous substance, which envelops the nerve-fibre, and in which the nerve-fibre ends; that the appearance of concentric capsules is produced by the parallel arrangement of the nuclei of the connective tissue and their elastic fibres; that, in a word, the Pacinian bodies are nothing more than thickened processes of the neurilemma of the nerve, and differ from the tactile corpuscles only in the degree of thickening and manner of disposition of the neurilemma.

Recognizing, therefore, the analogy of the Pacinian corpuscle with the axile corpuscle of the papilla, and observing that both exist in the most sensitive parts of the skin, and notably in parts where a special tact is resident, we are led to the conclusion, that they perform an important part in connection with the sense of touch; and this conclusion is borne out by tracing the progressive development of similar cutaneous organs in other animals. For example, the corpuscles described by Savi, in the skin of the torpedo, consist of a pedunculated capsule of homogeneous connective tissue, containing a clear gelatinous substance, and at the junction of the peduncle a small prominence, in which are found a vessel and the termination of a nerve. Now, the analogy of this organ with a Pacinian body is clear enough; but if, as Mr. Huxley remarks, a hair be produced on this vascular and nervous prominence, and this hair issue from the opposite pole of the capsule, the hair would be a sensitive vibrissa, the most fully developed form of this series of cutaneous organs. While, if the Savian corpuscle be supposed to be magnified in size, it would represent an eyeball, one of the highest organs of sense, of which the capsule is the sclerotic coat, the gelatinous substance, the vitreous humor, and the prominence of the peduncle the point of penetration of the optic nerve and the vessels of the retina. A similar analogy may be traced with

the organ of hearing; and all the organs of sense may thus be shown to be developed according to one simple and primitive plan.

The EPIDERMIS (Plate I.) is a membrane of defence spread out upon the surface of the derma. As we have previously observed, this membrane presents a difference of density according as it is viewed from its outer or its inner surface; the outer or free surface being dense and horny, the inner or attached surface being soft and composed of cells. Moreover, the epidermis is laminated in its structure, and the laminæ present a progressively increasing density, as they advance from the inner to the outer surface. This difference in density is dependent on the mode of growth of the epidermis; for, as the external surface is constantly subjected to destruction by attrition and chemical action, so the membrane is continually reproduced on its internal surface, new layers being successively formed upon the derma, to take the place of the old.

The mode of development and growth of the epidermis, I have made the subject of careful investigation; and as the results at which I have arrived present a new view of the mode of growth of cells, to that founded on the authority of Schwann, and generally received, I make no apology for quoting entire the paper[1] in which these observations are detailed:

"It is the commonly received doctrine at the present day that the cells of the epidermis, and of epithelium in general, originate out of materials furnished by the liquor sanguinis or plasma of the blood. In order that this purpose may be effected, the liquor sanguinis is conveyed by endosmosis through the walls of the capillary vessels, and through the peripheral boundary of the surface, the 'basement membrane' of Bowman. Having reached the exterior plane of the latter, the changes commence which result in the development of granules in the previously fluid liquor sanguinis, or rather, perhaps, in the aggregation of the molecules of the organizable material or blastema which was previously held in intimate suspension or solution by the liquor sanguinis. Out of the body, an action of this kind would be termed coagulation, and where inorganic matter is concerned, crystallization; and the process to which I am now referring, though taking place within the body, is analogous to these phenomena, with the difference of being controlled and directed by the power of life, of being, in point of fact, a vital coagulation or crystallization. Indeed, coagulation, though occurring out of the body, and sometimes after the lapse of a considerable period, may be regarded as the last act of vital existence, or as a vestige of the atmosphere of life with which the coagulating fluid was previously charged in abundance.

"As regards the tissue under consideration, there is every ground for belief that the organizable material or blastema of the liquor sanguinis is appropriated by the epidermis the very instant it reaches the exterior plane of the 'basement membrane,' some portion of it, and the greater part of the serum of the liquor sanguinis, being taken up by the newly-formed cells to be transmitted in succession to more

[1] This paper was read before the Royal Society, June 19, 1845.

superficial ranges of cells, and the remaining portion being converted on the spot into the primitive granules of the tissue. This belief is supported by the fact of the absence of any fluid stratum between the epidermis and the derma, and by the close connection known to subsist between those two membranes. It is well known that to separate the epidermis from the derma until the former is so thoroughly saturated with fluid by maceration as to have acquired a considerable addition to its dimensions in all directions, or until decomposition has commenced, is next to impossible; and in the living state of the body, separation never takes place until the mutual connection between the layers has been destroyed by the effusion of fluid. The microscope gives additional weight to this evidence; I have observed that the cells of the deep surface of the epidermis are in immediate contact with the boundary limit of the derma, and that, moreover, it is frequently difficult to determine the exact line between them. I have also made the following experiment: I cut very thin vertical slices of the skin at daily periods from the moment of death until decomposition had become established, and submitted them to the action of the compressor beneath the microscope; but in every instance, while fresh, the two tissues yielded to the pressure in equal proportion without any separation occurring. As soon, however, as decomposition had commenced, separation was produced, and in the early stages took place with difficulty. This experiment proves that the firm adhesion subsisting between the epidermis and derma is not alone due to the numerous inflexions of the former into the latter which take place at the sudoriferous tubes, hair tubes, and sebiferous ducts, although these inflexions must co-operate powerfully in the result.

"Being desirous of examining the under surface of the epidermis with the higher powers of the microscope, and failing in all my attempts to effect this object by taking the entire thickness of the epidermis or by scraping, I awaited the first indication of its separation[1] from the derma, and then removing it carefully, made a thin slice parallel with the surface which I wished to examine. This plan succeeded beyond my expectations; for not only did I obtain parts so diaphanous as to enable me to see the surface distinctly, but the septa between the depressions for the papillæ of the derma afforded natural laminæ of such transparency as permitted their structure to be well examined.

"When the under surface of the epidermis was exposed to view, I found it to be composed of four kinds of elements, arranged in such a manner as to constitute an irregular mosaic plane. These elements are—1. *Granules*, measuring about $\frac{1}{20000}$ of an inch in diameter; 2. *Aggregated granules*, measuring about $\frac{1}{10000}$; 3. *Nucleated granules*, measuring $\frac{1}{8000}$ to $\frac{1}{4000}$; and 4. *Cells*, measuring $\frac{1}{3000}$ to $\frac{1}{2500}$ of an inch. (Plate I., fig. 8.)

"The granules, which I may distinguish by the name of *primitive granules*, are globular in form, homogeneous, solid, brightly illumined

[1] It may be necessary to inform those who are unskilled in the manipulations required in pursuing investigations in minute anatomy, that no decomposition had occurred in this case; both epidermis and derma were perfectly fresh, and the separation resulted chiefly from the imbibition of water by the epidermis.

by transmitted light when the centre is under the focus of the microscope, but dark when viewed upon the surface, the darkness being increased whenever they are congregated in clusters. These granules I conceive to be the first organic shape of the blastema of the liquor sanguinis.

"The *aggregated granules*, measuring about $\frac{1}{10000}$ of an inch in diameter, are minute masses, composed of four, five, or six of the preceding, or as many as can be aggregated without leaving an unoccupied space in the centre of the mass. With an imperfect focus, these granules have the appearance of possessing a transparent globular nucleus; but this appearance ceases when the focus is perfect, and then the component granules are quite obvious, and the centre becomes a dark point, namely, the shadow caused by the meeting of the primitive granules.

"The *nucleated granules*, measuring between $\frac{1}{8000}$ and $\frac{1}{4000}$ of an inch in diameter, are in point of construction an 'aggregated granule,' with a single layer of aggregated granules arranged around it, so as to give the entire mass a circular or oval form. The central 'aggregated granule' has now become a nucleus, and at the same time has undergone other changes, which indicate its longer existence. For example, the primitive granules composing it are denser than they were originally, and they are separated from each other by a very distinct interstitial space, filled with a transparent and homogeneous matter. Sometimes this interstitial substance presses the granules equally on all sides, constituting a circular nucleus; but more frequently two opposite granules are more widely separated than the rest, and the nucleus receives an elongated form. The interstitial substance is most conspicuous at the line of junction of the nucleus with the secondary tier of 'aggregated granules,' and in this situation gives a defined character to the nucleus. Close observation and a perfect focus render it quite obvious that the peripheral tier of granules are in reality aggregated. They are lighter than the shaded granules of the nucleus, and apparently softer in texture.

"The nucleated granules are more or less flattened in their form, and present a flat surface of contact with the derma. It is this latter circumstance that gives the facility of determining their mode of construction.

"The cells of the deep stratum of the epidermis, measuring $\frac{1}{3000}$ to $\frac{1}{2500}$ of an inch in their longer diameter, are the most striking feature of this layer, and may be said to be its chief constituent. They originate, as is evident from their structure, in the nucleated granules previously described, and consist of a transparent layer added to the exterior of the former. Or, if I might be permitted to describe them as they appear in their tessellated position, they are constituted by the addition of a transparent border to the last described nucleated granule. The periphery of this transparent border is bounded by a dark interstitial substance, which gives the border a defined outline, and in the latter situation I imagine a cell-membrane to exist. I am not satisfied, however, that this is the case, and the difficulty of isolating these cells, and their roughness of outline when

separated, seem to prove that if a membrane be really present, it must be exceedingly thin and easily torn. Assuming, therefore, from analogy rather than from demonstrative evidence, that there exists a boundary membrane to the bodies I am now describing, I have termed them 'cells;' the cavity of the cell I apprehend to be 'the transparent border;' the 'nucleated granule' is the *nucleus* of the cell; the 'aggregated granule' of the latter the *nucleolus;* and the entire body a 'nucleolo-nucleated cell.'

"Before quitting the structure of the 'nucleolo-nucleated cell,' or primitive cell of the epidermis, there is a point of much interest to be mentioned with regard to it, which is, that the 'transparent border' just described is itself a tier of 'aggregated granules.' The nucleolus, therefore, is an 'aggregated granule,' the nucleus a tier (taking its flat surface) of aggregated granules surrounding the former, and the cell-chamber a tier of aggregated granules inclosing the whole.

"To return to the mosaic-like plane of the under surface of the epidermis: the largest of the pieces composing this plane are the nucleolo-nucleated cells. These are placed without order; in some parts closely pressed together, in others at short distances apart, and here and there leaving interspaces between them equal to the breadth of the cells. The interspaces or intercellular spaces are occupied by the 'nucleated granules,' 'aggregated granules,' and 'primitive granules,' irregularly set in a homogeneous interstitial substance, which fills up all vacuities. The granules and interstitial substance modify the light transmitted through them variously at different foci of the microscope; sometimes the granules look dark, while the interstitial substance is light, and sometimes the reverse is the case.

"Such is the structure of the mosaic-like plane of the under surface of the epidermis; and so far, my observations, having reference to facts, are demonstrable, and admit of being spoken to positively. The interpretation of the facts I would willingly leave to others, but feel that I am called upon to state any opinion, founded on the above observations, that I may have formed of the signification of these appearances. In the first place, then, I must acknowledge myself wholly divided between a belief in the possibility of formation of the 'aggregated granule' by the *aggregation of primitive granules*, the idea which prompted me to give it that name; and the formation of the 'aggregated granule' by the *cleavage of a primitive granule.* If this question related merely to the formation of the 'primary aggregated granule' it would be unimportant, but it has a more extended application. The uttermost layer of the nucleus is composed, as I have shown, of aggregated granules, and so also is that layer which alone forms the chamber in the nucleolo-nucleated cell. To these the hypothesis of cleavage of a single granule would be most suitable, and this theory would explain, better than any other, changes which remain to be described in the further growth of the epidermal cell. In the second place, the relation of cell and nucleus is a question on which I feel

Fig. A.

The under surface of the scarf-skin, showing the mosaic-like appearance of the newly-formed surface.

considerable doubt. The process of development appears to consist in the successive production of granules, one layer of granules succeeding another, so that, if the organizable principle exists in each separate granule, the organizable force may be supposed to be more and more weakened in successive formations until the moment arrives when it ceases entirely. Is that which I have described as a 'nucleolo-nucleated cell' really a cell or still a nucleus? The only solution of the question that occurs to me is, determining the presence of a cell-membrane, in which I have not satisfactorily succeeded.

"Admitting the nucleolo-nucleated bodies now described to be cells in their earliest state of formation, their size is $\frac{1}{3000}$ to $\frac{1}{2500}$ of an inch in the long diameter, and that of their nucleus from $\frac{1}{6000}$ to $\frac{1}{4000}$ of an inch. In the stratum immediately above the deepest layer I find cells measuring $\frac{1}{2000}$ of an inch with nuclei of $\frac{1}{4500}$. Above these, cells measuring $\frac{1}{1800}$, with nuclei varying from $\frac{1}{4000}$ to $\frac{1}{3000}$, and above the latter, cells measuring $\frac{1}{1500}$ with nuclei of $\frac{1}{2500}$. In following the layers of epidermis upwards to the surface, cells may be observed possessing every intermediate degree of size between the last-named cell, namely, $\frac{1}{1500}$ and $\frac{1}{600}$, which is the measurement of the scales which constitute the uppermost stratum of the epidermis. It must not be supposed, however, that the growth of the epidermal cells reaches its maximum only at the surface; I have found cells of that magnitude in the deeper strata, and there is every indication of the growth of these cells being completed in the stratum immediately above the mosaic-like layer.

"Young cells are remarkable for the large size of the nucleus as compared with the entire bulk of the cell, and it is quite evident also that the nuclei, up to a certain point, grow with the cells; their mode of growth appearing to be the separation of the original granules by the deposition between them of interstitial matter, and in addition, as I believe, by cleavage and the consequent multiplication of the granules; in cells measuring $\frac{1}{2000}$ and $\frac{1}{1800}$ of an inch, I found the granular character of the nucleus to be very manifest. Besides growth, it is apparent that other changes are taking place in the nucleus; imbibition and assimilation of organizable material must necessarily be in action in order to accomplish the formation of interstitial matter; but, in addition to this, the central granules undergo another change, by which they are altered in character, and become distinguished from the rest when submitted to chemical experiment. For example, when diluted acetic acid is added to the cells measuring $\frac{1}{2000}$ of an inch and less, the entire nucleus is rendered transparent and less discernible than before; but when cells of a somewhat larger size, and consequently longer growth, are submitted to the same process, the nucleus is rendered much more distinct than it was previously. But the body which is made so conspicuous in this latter experiment is not the entire nucleus, but simply the central and older granules of the nucleus; the younger granules retain the character of those of the young cells: they are made more transparent than they were before, and have faded from sight. I may mention, also, that the nucleus brought into view by the acetic acid is more or less irregular in form, and has the appear-

ance of being constituted by the fusion of the original granules. How much of this appearance may be real, and how much the effect of the acid, I do not pretend to say; and I set no value on the experiment beyond the demonstration of the mere fact which it is made to illustrate.

"I now turn to the growth of the cells: I have remarked, in an earlier paragraph, that the formation of the young cell appears to be due to the development of a stratum of 'aggregated granules' externally to the nucleated mass which I have regarded as the cell-nucleus. Now, nothing is more certain than that the growth of the cell is due to a successive repetition of this process; the growth of the cell-membrane being consentaneous with the development and growth of aggregated granules within it. In cells of $\frac{1}{1800}$ to $\frac{1}{1500}$ of an inch, the aggregated granules of the periphery are not easily discernible, but in cells measuring $\frac{1}{1000}$, and thence upwards to the complete size of the epidermal cell, the fact is quite evident, and is apparent even in the cell-scale. Indeed, a cell at the full period of growth is a kind of cell microcosm, containing in its interior, secondary cells, tertiary cells, nucleolo-nucleated cells, nucleated granules, aggregated granules, and primitive granules. (Plate I., fig. 8, H.)

"It will be observed that this hypothesis of cell-growth differs from that of Schwann. The theory of Schwann always appeared to me to be incompetent to the explanation of the growth of the large scale of epidermis and epithelium in a tissue manifestly subjected to considerable pressure. I sought in vain for the watch-glass cells, elliptical cells, and globular cells in the epidermis, and my search has been rewarded by the discovery of the above described beautiful process of formation and growth. It will be seen that, according to this view of the growth of epidermal cells, they never possess anything approaching to a globular form; that the scales are not flattened spheres, but, on the contrary, always possessed a flattened form, and have increased by a peripheral growth. This mode of growth, again, is made manifest by the observation of a vertical section of the epidermis. The most careful examination can distinguish no difference between the size of the deeper and superficial strata of cells: they have all the same average thickness, all the same average length, an appearance easily explained, when we regard them as parent cells, containing secondary and tertiary cells of the same average size as the cells of earlier formation. It is true, that the complete size of the cell is very quickly attained, and that its growth, taking place in the deepest stratum of the epidermis, could not be expected to produce any difference of character in the middle and superficial strata; but this is not mentioned, as far as I know, by Schwann.

"The process of growth here described explains also the fact of the disappearance of the nucleus in the scales of the epidermis. The outermost granules of the nucleus have become the nuclei or nucleoli of secondary cells, and have consequently been moved away from their original position in the performance of the office of centres of growth to secondary cells. The original nucleus, therefore, is not lost, but merely robbed of some of its component granules, which may be dis-

covered in many parts of the epidermal scale, instead of being concentrated in a single mass. In these scales, and particularly in epithelial scales, the central and denser part of the original nucleus is generally perceptible: in the latter it constitutes the scale-nucleus, and in the epidermal scale there is always some one little mass larger than the rest, particularly if the scale have been for some time immersed in fluid, as when it is examined in the serum of a blister. In an epidermal scale, measuring $\frac{1}{800}$ of an inch in long-diameter, I found several secondary cells measuring $\frac{1}{1500}$, others measuring $\frac{1}{5000}$, and in the interstices, primitive granules, aggregated granules, and nucleated cells.

"My observations, it will be seen, have been chiefly directed to the epidermis, and I am prevented at present from carrying them further; but I have no doubt that the epithelium will be found to be identical, in the phenomena of development and growth, with the epidermis. I have observed the same structure in the epithelium of the mouth and fauces, and also in that of the bladder and vagina. Incomplete epithelial cells from the fauces, measuring $\frac{1}{570}$ and $\frac{1}{700}$ of an inch, presented a very remarkable appearance; they had a rounded lobulated border, evidently composed of a row of secondary cells, and a depressed centre, as though the action were subsiding in the latter while it was progressing in the circumference.

"Another illustration of the structure now described, I found in the cells of melanosis, and in the pigment cells of the choroid membrane of the eyeball, and I am induced to believe that the same structure will be discovered more extensively than at present can be anticipated. The corpuscles of melanosis, according to my observation, are parent cells, having an average measurement of $\frac{1}{1000}$ of an inch, containing secondary cells and nucleated and aggregated granules, as well as separate primitive granules. The aggregated granules measured from $\frac{1}{11000}$ to $\frac{1}{7000}$ of an inch, and the primitive granules about $\frac{1}{20000}$.

"There is another feature in the history of development of the epidermal cell, which I regard as peculiarly interesting. This relates to an organic change taking place in the assimilative powers of the primitive granules, by which the latter are altered in their color; in short, are converted into 'pigment granules.' Pigment granules appear to differ in no respect from the primitive granules, excepting in tint of color and chemical composition. They have the same globular form, the same size, and occupy the same position in the cell, being always accumulated around the nucleus, and dispersed less numerously through the rest of the cell. The nucleus of the cell in the epidermis of the negro appears to consist wholly of pigment granules; while, in the European, there is a greater or less admixture of colored and uncolored granules. The central granules are generally lighter in tint than the rest, and give the idea of a colorless nucleolus, while those around the circumference are more deeply colored. Besides a difference in the depth of color of the separate granules entering into the composition of a single cell, there is also much difference in the aggregate of the granules composing particular

cells. For example, intermingled with cells of a dark hue, there are others less deeply tinted, which give the tissue in which they are found a mottled appearance. This fact is well illustrated in the hair and also in the nails; in which latter it is no uncommon thing to find an isolated streak produced by the accumulation of a number of cells containing colored granules in the midst of colorless cells.

"When pigment granules are examined separately, they offer very little indication of the depth of color which is produced by their accumulation. I have observed some to have the hue of amber, while others scarcely exceeded the most delicate fawn. The depth of color of the deep stratum of the epidermis in the negro is evidently due to the composition of that layer, of these granules chiefly, while the grayness of the superficial layers of the same tissue results not merely from the desiccation of these granules, but also from the fact of those subsequently produced being less strongly colored, and also from the addition of a considerable mass of colorless cell membrane. The epidermal scale of the negro has a mottled appearance, from the numerous secondary nuclei, and their attendant colored granules, which are scattered through its texture."

It follows, from a review of the structure of the epidermis, that this membrane is accurately modelled on the papillary layer, that each papilla finds its appropriate sheath in the newly-formed epidermis or rete mucosum, and that each irregularity of surface of the former has its representative in the soft tissue of the deep layers of the latter. (Plate I, figs. 2, 5.) It is not, however, the same with the external surface of the epidermis; this is modified by attrition and exposure to chemical and physical influence; the minute elevations, corresponding with the papillæ, are, as it were, polished down, and the surface is consequently rendered smooth and uniform. The palmar and plantar surfaces of the hands and feet are an exception to this rule, for in these situations, in consequence of the large size of the papillæ, and their peculiar arrangement in rows, ridges corresponding with the papillæ are strongly marked on the superficial surface of the epidermis. (Plate I, fig. 1.) Moreover, upon the borders of the fingers, where the linear-disposed and magnified papillæ of the palmar surface gradually pass into the irregular and minute papillæ of the dorsal surface, a transition state of the epidermis may usually be observed.

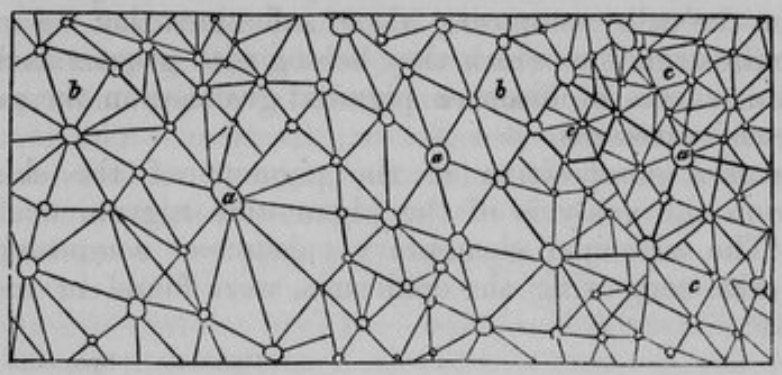
Besides the form bestowed upon the epidermis by its relation with the derma, its degree of thickness will be found to be dependent upon the same source, and to bear an accurate proportion to the degree of development of the papillæ. Thus, on the palms[1] of the hands, where the papillæ are large, the epidermis is thick; while on the backs of those organs, or on the scalp, where the papillæ are small, it is exceedingly thin.

Another character presented by the epidermis is also to be considered as the consequence of its connection with and dependence on the

[1] In an individual not exposed to much manual labor, I found the epidermis in the palm of the hand to measure one-fourth of a line in thickness. The horny covering of the foot of the dog is formed by papillæ of unusually large size, and highly vascular.

derma—namely, the network of linear furrows, which every where intersect each other, and trace out the surface into small polygonal and lozenge-shaped areæ. These lines correspond with the folds of the derma produced by its movements, and are most numerous where

Fig. B.



those movements are greatest, as in the flexures, and on the convexities of joints. Some difference is perceived in the form of the areæ, when examined in these two situations; thus, in the flexures of the joints they are narrow and long, and, for the most part, lozenge-shaped in their figure, while on the convexities of joints, as upon the elbow and knee, the areæ are large, and more nearly quadrangular. The furrows of the epidermis admit of a division into two kinds,—namely, those which correspond with joints, and bear relation to the movements of the body and limbs, and those which belong especially to the movements of the skin. The first or larger kind are those which are so perceptible on the flexures and convexities of joints, and on the palm of the hand and the sole of the foot. The latter or smaller occupy the interspaces of the former, and those parts of the surface where the furrows of articular motion have no existence. Their plan of arrangement is as follows: from each of the hair-pores (*a*, *a*) there pass off on all sides, like rays from a centre, from six to ten lines, which meet by their extremities lines proceeding from other pores. These lines mark out the surface into small triangular spaces (*b*, *b*), or areæ, within which are other and more minute pores, probably perspiratory pores. From the latter a similar number of radiating lines are given off, and abut against the coarser lines, dividing the surface into smaller triangular areæ (*c*, *c*), and giving to the entire network the appearance of a number of nicely-adjusted angular wheels. On the shoulder of a child of about five years of age, I counted sixty of the hair-pores with the wheel-like rays within the limit of a square inch; while between these larger pores were six hundred smaller pores, constituting so many secondary centres and secondary wheels, and forming an elegant mosaic pattern. On the scalp, the furrows run between the hair-pores, and the included areæ are more open than on the general surface of the skin.

The deeper tint of color of the skin observable among the nations of the South, and in certain regions of the skin of the European, is due to the presence of pigment granules in the cells of the epidermis.

The pigment-bearing cells are most abundant in the furrows of the derma, and in the hollows between the papillæ. The production of pigment granules is not, however, limited to the horizontal stratum of the derma: they are also met with in the various inflexions of the epidermis, constituting the lining of the sudoriparous and sebiparous glands, and hair-follicles. It is in consequence of the presence of these granules in the cells composing these inflexions that we are enabled to perceive the organs to which they belong with greater facility; and, for the same reason, we discover pigment granules in the perspiratory and sebaceous secretions.

The chemical composition of the pigment of the skin may be inferred from the analysis of the pigmentum nigrum oculi made by Scherer.[1] The principal elementary substances composing this pigment, and also composing the epidermis, were found in the following proportions:

	Pigment.	Epidermis.
Carbon,	58.27	50.34
Hydrogen,	5.97	6.81
Nitrogen,	13.76	17.22
Oxygen,	21.98	25.63

The proximate composition of the epidermis, according to an analysis by John, is as follows:

Hardened albumen,	93.0 to 95.0
Gelatinous matter,	5.0 "
Fat,	0.5 "
Lactic acid: salts and oxides,	1.0 "

The salts are lactate, phosphate, and sulphate of potash; sulphate and phosphate of lime; and sulphate and phosphate of ammonia; the oxides, those of manganese and iron.

The identity of structure of the external tegument or skin, with the internal tegument or mucous membrane, has long been established. In both the same parts are found, and each is continuous with the other. Mr. Bowman directs our notice[2] to this fact, and adduces another point of similitude between these membranes. He finds beneath the epithelium of mucous membranes, on the one hand, and in contact with the vessels of the parenchyma on the other, "a simple, homogeneous expansion, transparent, colorless, and of extreme tenuity;" this delicate expansion serves as a foundation on which the epithelium rests; and in accordance with this view he terms it the "*basement membrane.*" This is, in fact, the boundary layer of all vascular membranes, and as such is met with in serous as well as in mucous structures. The extreme tenuity of the basement membrane may be inferred from the measurements instituted by Mr. Bowman; in the uriniparous tubuli its thickness does not exceed $\frac{1}{20000}$ of an inch; in the seminiparous tubuli, it is $\frac{1}{10000}$ of an inch in thickness; in the lungs, it forms almost the entire thickness of the air-cells; and in no situation has it been found to exceed $\frac{1}{8000}$ of an inch. Reasoning from analogy, he infers the existence of a corresponding membrane on

[1] Liebig, Organic Chemistry.
[2] Cyclopedia of Anatomy and Physiology; Article, Mucous Membrane.

the surface of the derma—an inference that will be unreservedly accorded him; but he finds it difficult to demonstrate this membrane in the latter situation, in consequence of its close adherence to the vascular rete, and deeper seated stratum. The same difficulty exists on the general surface of the mucous membranes, and for the same reason; but, in the minute tubuli of the secreting glands, the connection between the basement membrane and the vascular rete is so slight, that they separate on the gentlest pressure. In like manner he finds no difficulty in distinguishing this membrane in the tubuli of the sudoriparous and sebiparous glands; and he remarks, that it is it which gives firmness and form to the minute tubuli of secreting glands.

SUDORIPAROUS SYSTEM.

The SUDORIPAROUS GLANDS (Plate II., fig. 3) are situated in the middle and deeper stratum of the corium—namely, at about half a line below the plane of the upper surface of the epidermis, and also in the subcutaneous cellular tissue. They are small round or oblong bodies, of a reddish-yellow color, and composed of the convolutions of a minute tube, which commences by a cœcal extremity, and after quitting the gland, mounts to the surface of the epidermis and becomes its efferent duct. The efferent duct ascends through the structure of the derma and epidermis, to terminate by a funnel-shaped and oblique aperture or pore upon the surface of the latter. The sudoriparous glands are found in every part of the body with the exception of the inside of the concha and the meatus auditorius, and they present considerable differences of size in different regions. They are smallest on the eyelids, the nose, the pinna of the ear, the penis, and the scrotum, where they average $\frac{1}{120}$ of an inch in diameter; and largest in the areola of the mamma, at the base of the scrotum and penis, and in the axilla—in the latter situation reaching a size of half a line to a line and a half. The common average of bulk of these glands in their general distribution is $\frac{1}{60}$ of an inch; and in the palm of the hand I found them range between $\frac{1}{200}$ and $\frac{1}{100}$ of an inch. The entire length of each tubulus, comprising that which constitutes the gland, as well as the excretory duct, is about one quarter of an inch. The efferent duct presents some variety in its course upwards to the surface. Below the derma it is curved and serpentine; and having pierced the derma, if the epidermis be thin, it proceeds more or less directly to the excreting pore. Sometimes it is spirally curved beneath the derma, and having passed the latter, is regularly and beautifully spiral in its passage through the epidermis, —the last turn forming an oblique and valvular opening on the surface.

Fig. C.

A perspiratory gland with its tubule.

a. The pore. *b*. That portion of the tube which is situated in the scarf-skip; the spiral is close. *c*. The tube within the sensitive skin; the spiral is more open than the preceding. *d*. The gland.

The spiral course of the duct is especially remarkable in the thick epidermis of the palm of the hand and the sole of the foot. In those parts of the body where the papillæ of the derma are irregularly distributed, the efferent ducts of the sudoriparous glands open on the surface also irregularly, while on the palmar and plantar surface of the hands and feet, the pores are situated at regular distances along the ridges, at points corresponding with the intervals of the small square-shaped clumps of papillæ. (Plate I., fig. 1; Plate II., fig. 1.) Indeed, the apertures of the pores seen upon the surface of the epidermal ridges give rise to the appearance of small transverse furrows, which intersect the ridges from point to point. On the palm of the hand and palmar surface of the fingers the sudoriparous pores are situated at about one-sixth of a line apart along the ridges, and at a little less than a quarter of a line from ridge to ridge. On the heel there are four and a half pores in the compass of a line along the ridge, and three and a half across the ridges.

Krause estimates the total number of sudoriparous glands of the entire body, exclusive of those of the axilla, which are so numerous as to form almost a continuous layer beneath the corium, at 2,381,248. On the cheeks, the back of the trunk, and thighs, he estimates the number in a square inch of surface at 400 to 600; on the rest of the trunk of the body, the forehead, neck, forearm, leg, and back of the hand and foot, at 924 to 1090; in the palm of the hand, at 2736; and in the sole of the foot, at 2685. This estimate is probably somewhat too high, but may be accepted as a general idea; the aggregate bulk of these organs, including those of the axilla, he states at 39,653 cubic inches.

The efferent duct and glandular tubulus of the sudoriparous gland are lined by an inflection of the epidermis. This inflection is thick and infundibuliform in the upper strata of the derma, but soon becomes uniform and soft. The infundibuliform projection is drawn out from the duct when the epidermis is removed, and may be perceived on the under surface of the latter as a nipple-shaped cone (Plate I., fig. 2). A good view of the sudoriferous ducts is obtained by gently separating the epidermis of a portion of decomposing skin; or they may be better seen by scalding a piece of skin, and then withdrawing the epidermis from the derma. In both these cases it is the lining sheath of epidermis which is drawn out from the duct (Plate III., fig. 17). The average diameter of the tubular epidermal lining of a sudoriferous duct examined in the palm of the hand was $\frac{1}{700}$ of an inch, two-thirds of this diameter being constituted by the wall of the tubule, and the remaining third by its area. The parietes of the tubule were composed of two or three layers of cells, of which the most external, namely, those which corresponded with the corium, measured $\frac{1}{3000}$ of an inch in diameter.

The tubule of the sudoriparous gland and that of the efferent duct into which it is prolonged are uniform in diameter, and composed of two, and, in some instances, of three coats; the two coats are an outer fibrous coat, which is continuous above with the basement membrane of the surface of the derma, and an epithelial lining identical in struc-

ture with the deep layer of the rete mucosum. In certain of the glands, especially those of larger size, there is an intermediate coat of smooth muscle, and a similar coat is found in the efferent ducts of the glands in the axillary region. In these latter, moreover, the efferent duct is sometimes seen to bifurcate, and sometimes its branches have been observed to divide dichotomously in forming the convolutions of the gland. The cavity of the tubule presents two important differences: in one it is open for the greater part of the whole of its extent, in which case the epithelial lining is distinct; in the other, the tubule is filled with epithelial contents to a greater or less degree, and there is no cavity present excepting in the efferent duct. The contents of the tubules of the smaller glands are commonly clear and aqueous, while those of the larger glands are opaque and grumous, and composed of an admixture of cells, entire and broken up, cell-nuclei, and granules, suggesting a resemblance with sebaceous substance, and the more so as there is also present protein and fat.[1] When, therefore, the tubules contain fluid only, the epithelial lining is complete; but when the contents are of the mixed character already described, the epithelial lining is more or less deficient or entirely absent. Hence the perspiration participates in the double mode of secretion common amongst glands, namely, transudation and cell elaboration.

The sudoriparous gland is inclosed in a network of capillary vessels, which in an injected preparation have a very beautiful appearance; but nothing is known as to the arrangement of its nerves.

Taken separately, the little perspiratory tube, with its appended gland, is calculated to awaken in the mind very little idea of the importance of the system to which it belongs; but when the vast number of similar organs composing this system are considered—for it includes the sebiparous glands, which are also agents in perspiration—we are led to form some notion, however imperfect, of their probable influence on the health and comfort of the individual. I use the words "imperfect notion," advisedly, for the reality surpasses imagination and almost belief. To arrive at something like an estimate of the value of the perspiratory system in relation to the rest of the organism, I counted the perspiratory pores on the palm of the hand, and found 3528 in a square inch. Now, each of these pores being the aperture of a little tube of about a quarter of an inch long, it follows, that in a square inch of skin on the palm of the hand there exists a length of tube equal to 882 inches, or 73½ feet. On the pulps of the fingers, where the ridges of the sensitive layer of the true skin are somewhat finer than in the palm of the hand, the number of pores on a square inch a little exceeded that of the palm; and on the heel, where the ridges are coarser, the number of pores in the square inch was 2268, and the length of tube 567 inches, or 47 feet. To obtain an estimate of the length of tube of the perspiratory system of the whole surface of the body, I think that 2800 might be taken as a fair average of the number of pores in the square inch, and 700, consequently, of the number of inches in length. Now, the number of square inches of

[1] Kölliker.

surface in a man of ordinary height and bulk is 2500;[1] the number of pores, therefore, 7,000,000, and the number of inches of perspiratory tube 1,750,000, that is, 145,833 feet, or 48,600 yards, or nearly twenty-eight miles.

The development of the sudoriparous apparatus has been observed and described by Kölliker. He discovered small masses of nucleated cells resembling buds, growing from the rete mucosum into the derma, in the foot of the fœtus at the fifth month; by the sixth month, the buds, assuming the form of elongated processes with cœcal ends, had reached the mid-thickness of the corium; by the end of the seventh month they had traversed the entire thickness of the corium, and were bent at the extremity, beginning to assume the convoluted arrangement they were afterwards to possess. Subsequently they pursued their progress with rapidity; continued cell-multiplication enabled them to reach their full length; the convolutions increased until the gland was perfected; and the central cells yielding to the process of softening and liquefaction common to the formation of tubular glands, their cavity was established. So that, at the time of birth, the sudoriparous system is complete throughout the entire skin.

SEBIPAROUS SYSTEM.

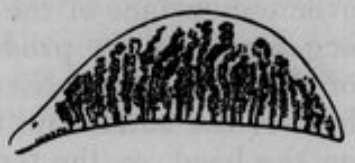
The SEBIPAROUS GLANDS (Plate III.) are the special producing organs of the sebaceous substance or fatty secretion of the skin; they are associated with the hairs, being connected with the upper part of the hair-sacs, and, like the hairs, are distributed almost universally over the surface of the body. They are situated in the upper part of the corium, and are either simple follicular sacs, or more or less subdivided into branches or lobules, so as to constitute simple racemose and compound racemose glands. Opening into the hair-sacs of the scalp there exist commonly a pair of these glands to each hair, while in the beard and axilla there are more; and in the mons veneris, labia majora, and scrotum, often as many as seven or eight, which surround the neck of the hair-sac and have a radiated or rosette-like appearance. They are whitish in color, and vary in size from the five or six hundredth of an inch to a line in diameter. The largest of the sebiparous glands of the body are those of the eyelids, the meibomian glands.

The purpose of the sebiparous organs being to supply the surface of the skin with an oily secretion, they are found most abundantly in situations where such a secretion is chiefly required, as among the hair, to which they lend their aid in preserving its smooth and glossy appearance; on the face, and particularly its more exposed parts, as the nose; in the hollow of the folds of the body, as the axilla and pudendum; and around the apertures of junction with the mucous membrane, as along the eyelids, and at the anus. The so-called ceruminous glands of the ear-tubes have been shown by Kölliker to belong

[1] Haller's estimate of the extent of surface of the body is fifteen square feet, that is, 2160 square inches.

rather to the sudoriparous than to the sebiparous system, and are not the producers of the cerumen or ear wax, which is a sebaceous matter secreted by sebiparous glands, which are as abundant in the meatus auditorius as elsewhere.

Fig. D.



Meibomian glands; natural size; imbedded in the cartilage of the upper eyelid.

In structure, a sebiparous gland is composed of membrana propria, or proper investing coat, consisting of areolar or connective tissue, and an internal epithelial lining of nucleated cells, which is continuous through its excretory duct with the outer root-sheath of the hair-sac. The excretory or sebiferous duct is the medium of communication between the gland and the hair-sac, and its epithelial lining consists of several layers; but in the subdivisions of the gland these layers are reduced in number, until in the glandular vesicles of the periphery there remains only a single layer. Within the cavity of the gland is found a grumous pulp, more or less fluid, consisting of cells containing a yellowish and transparent homogeneous substance, others containing small globules of oil, and others again filled with oil; this, with some free oil and watery fluid, is the sebaceous secretion. It is not a fluid secretion, but a cellular secretion. In chemical composition the sebaceous substance, according to Esenbeck, consists of fat, albumen with casein, extractive matter, and phosphate of lime, in nearly equal proportions.

The sebiparous glands have no special supply of capillary vessels, as have the sudoriparous glands; and nothing is known as to their nerves.

Development of the sebiparous glands takes place from the hair-sacs between the fourth and fifth month of fœtal existence, and follows the order of formation of the hairs. The first trace of the future gland is a bud-like prominence of the neck of the hair-sac, derived from and consisting of nucleated cells identical with those of the outer root sheath; the bud elongates, and either remains single or divides, and by the same process of budding its division continues until the entire gland is completed. This completion does not always take place at once, but the process may cease for a time and subsequently be resumed; hence, it is continued after birth and during the growth of the body, or may be set up in after life as a pathological action. At about the sixth month a difference of character is observed between the cells of the periphery of the newly-formed gland and those of the centre; the latter becoming darker colored, and are found to contain globules of oil: this is the sebaceous secretion. The process of separation of the cells commences at the distal part of the gland, and gradually moves onward to the excretory duct, until it reaches the hair-sac; and its secretion-cells are poured out into the hair-sac to be distributed on the surface of the skin. The growth of the glands, as well as the formation of the secretion, is a process of cell-multiplication, the production of a succession of new cells out of the elements of the older or parent cells.

HAIRS.

HAIRS (Plate IV.) are horny filaments, appertaining to the structure of the skin, and distributed more or less extensively and abundantly over the surface of the body. Every part of the cutaneous surface is organized for the production of hair, with the exception of the palms of the hands, the soles of the feet, the dorsum of the ungual phalanges both of the hands and feet, and the upper eyelids. They are abundant on the head, on the face, in the axillæ, on the pubes, and less numerously dispersed over the trunk of the body and limbs, and they present certain special characters, such as shape, size, length, color, quantity, and structure, which call for separate consideration. We have also to pass in review their mode of growth, their development, and their physiological dependence on the rest of the organism.

A hair admits of a natural division into a middle portion or shaft (scapus), and two extremities; a peripheral extremity, the point; and a central extremity inclosed within the skin, the root. The root is somewhat thicker than the shaft, and cylindrical in figure, while its extremity is expanded into a spherical or oval mass twice or three times the thickness of the shaft, the bulb.

The shaft of the hair is rarely perfectly cylindrical; it is more or less compressed or flattened, and oval or fabiform in section. Leeuwenhoeck observes with regard to the shape of the hair, "quot crines, tot figuræ." This, however, is not strictly true, for the typical figure of the shaft of the hair is cylindrical; and the aberrations from that type are more or less flattening in consequence of desiccation by the air of that part of the shaft which is emitted from the follicle in which its root is contained. Flattening of the shaft gives rise to waving and curling hair; and in hair which is much curled the flattening is more or less spiral in direction.

Hairs are divisible into two primary groups, long and short; but each of these groups admits of division into two sub-groups, namely, 1. Long and soft hairs, of which the hairs of the head are the type; 2. Long and stiff hairs, which include the hair of the beard, whiskers, pubes, and axilla; 3. Short and stiff hairs, such as those of the eyebrows, the eyelashes, the vibrissæ nasi, and the hairs of the meatus auditorius; and, 4. Short and fine hairs, including the downy hairs (lanugo), and those of the caruncula lachrymalis.

The hairs of the head offer much variety in point of size. For example: in 2000 hairs taken from 38 persons, the finest ranged between $\frac{1}{15000}$ and $\frac{1}{5000}$ of an inch; the former of these occurring in three instances, one in black, the others in brown hair, the subjects of the observations being adult men; the latter in seven persons, two men with black hair, and five women, four with brown and one with chestnut hair. The coarsest hairs in the same heads ranged between $\frac{1}{4000}$ and $\frac{1}{1400}$ of an inch, the former being the flaxen hair of a female child, and the latter, a brown hair from the head of a female adult. In three South American Indians, a man, a young woman, and a child, the finest hair occurred in the child ($\frac{1}{10000}$ of an inch), next in the man ($\frac{1}{5000}$), and lastly in the woman ($\frac{1}{4500}$). The coarsest hairs of

the same individuals were $\frac{1}{240}$ of an inch in the man and woman, and $\frac{1}{210}$ in the child. The color of the hair in the two former was black, and that of the child red. In a New Zealand chief, the finest of fifty hairs measured $\frac{1}{450}$, and the coarsest $\frac{1}{200}$ of an inch. The influence of a morbid habit on the hair is shown in the instance of a scrofulous female child; of ninety-seven of the flaxen hairs of this child, the finest measured $\frac{1}{1750}$, and the coarsest $\frac{1}{450}$ of an inch. For convenience of reference I have arranged these measurements in a tabular form, as follows:

	Number of hairs examined.	Finest.	Coarsest.
British,	2000[1]	$\frac{1}{1500}$ to $\frac{1}{500}$	$\frac{1}{400}$ to $\frac{1}{140}$
South American Indians,	155	$\frac{1}{1000}$ to $\frac{1}{450}$	$\frac{1}{240}$ to $\frac{1}{210}$
New Zealander,	50	$\frac{1}{450}$	$\frac{1}{200}$
Scrofulous child,	97	$\frac{1}{1750}$	$\frac{1}{450}$

The average thickness of the 2000 hairs above examined ranged between $\frac{1}{550}$ of an inch, the flaxen hair of a female child, and $\frac{1}{250}$ of an inch, the brown hair of an adult woman. The average thickness of the hairs of the three South American Indians was $\frac{1}{450}$ of an inch in the child, $\frac{1}{350}$ in the woman, and $\frac{1}{300}$ in the man. The average measurement of the hair of the New Zealand chief was $\frac{1}{350}$, and that of the scrofulous child, $\frac{1}{600}$ of an inch. In a tabular form, these measurements would stand as follows:

British,	$\frac{1}{550}$ to $\frac{1}{250}$
South American Indian,	$\frac{1}{450}$ to $\frac{1}{300}$
New Zealander,	$\frac{1}{350}$
Scrofulous child,	$\frac{1}{600}$

The average dimension in thickness of human hair, according to the above table, is $\frac{1}{400}$ of an inch. Leeuwenhoeck and Rosenmüller state it to be $\frac{1}{800}$ of a Paris inch,[2] which is certainly too little; while Weber approaches more nearly to the measurements given above, as may be seen by the following table:

His own hair,	$\frac{1}{555}$ to $\frac{1}{370}$	Paris inch.
Mulatto,	$\frac{1}{450}$ to $\frac{1}{279}$	"
Senegambian negro, woolly,	$\frac{1}{714}$ to $\frac{1}{303}$	"
Nubian negress,	$\frac{1}{525}$ to $\frac{1}{294}$	"

Rosenmüller's table is as follows:

Adult,	$\frac{1}{600}$ to $\frac{1}{400}$	Paris inch.
Child,	$\frac{1}{800}$ to $\frac{1}{700}$	"
Lanugo from body of fœtus,	$\frac{1}{1600}$	"

It is probable that these writers deduce their average from extremes of measurement, a proceeding that must necessarily lead to error. A correct average can only be obtained by ascertaining the medium range, and deducing the average from that range.

With respect to the influence of age and sex upon the thickness of the hair, my observations are in favor of the coarsest hair being found

[1] The measurements were in all cases made as close to the head as possible, to avoid the influence of stretching and wear.

[2] A Paris inch is $\frac{1}{15}$ longer than an English inch.

in the female, and the finest in the male; and of the hair of children being finer than that of the adult, thus:

	Number of heads.	Number of hairs.	Range of thickness.
Child,	6	269	$\frac{1}{350}$ to $\frac{1}{400}$
Man,	18	1016	$\frac{1}{325}$ to $\frac{1}{300}$
Woman,	18	940	$\frac{1}{300}$ to $\frac{1}{250}$

This is the reverse of what might have been anticipated; I should certainly have looked for a coarser hair in the male than in the female, for, independently of sex, the habit of cutting the hair closely might have been expected to conduce to its greater strength. Indeed, in one of the cases examined, the head had been repeatedly shaven with a view to render the growth of the hair strong, but the hair did not exceed the medium average of size.

The variety in the thickness of the hairs of the same head is very considerable, as may be perceived in the following instances, taken without selection from a number of observations:

Number of hairs.	Finest.	Coarsest.	Medium range.	Average.
67	$\frac{1}{1500}$	$\frac{1}{250}$	$\frac{1}{250}$ to $\frac{1}{350}$	$\frac{1}{450}$
81	$\frac{1}{1500}$	$\frac{1}{300}$	$\frac{1}{350}$ to $\frac{1}{600}$	$\frac{1}{400}$
79	$\frac{1}{1250}$	$\frac{1}{250}$	$\frac{1}{350}$ to $\frac{1}{750}$	$\frac{1}{450}$
97	$\frac{1}{750}$	$\frac{1}{250}$	$\frac{1}{300}$ to $\frac{1}{350}$	$\frac{1}{400}$
57	$\frac{1}{550}$	$\frac{1}{210}$	$\frac{1}{250}$ to $\frac{1}{270}$	$\frac{1}{250}$
64	$\frac{1}{500}$	$\frac{1}{240}$	$\frac{1}{300}$ to $\frac{1}{400}$	$\frac{1}{400}$

The "medium range" in this table includes the measurements within which the greatest number of hairs are found, and from it the average is deduced.

Variety in thickness is not, however, confined to the different hairs of a single head; it is met with even in an individual hair. Thus, a hair six inches long, and apparently of uniform dimensions, ranged between $\frac{1}{500}$ and $\frac{1}{320}$ of an inch at various points of its length; another ranged between $\frac{1}{400}$ and $\frac{1}{190}$; while a white hair, which was obviously enlarged at short distances, presented a range of $\frac{1}{450}$ to $\frac{1}{230}$, the diameter of its point measuring $\frac{1}{3000}$ of an inch. The short hairs of the body not unfrequently exhibit an appearance which may be termed varicose. In the instance of the long hairs of the head a small share of the difference of diameter may be referred to over-stretching in dressing the hair, but this cause cannot apply in the case of the varicose hairs. It has been shown by experiment that hair is so elastic that nothing but inordinate stretching could occasion the permanent constrictions to which my admeasurements refer. Weber found a hair ten inches long to stretch to thirteen inches, and a hair stretched one-fifth returned to within one-seventeenth of its original length.

With respect to color as a condition associated with diversity in thickness, my observations tend to show that flaxen is the finest, and black the coarsest hair. Gray hairs commonly represent in thickness the color which they succeed; but as a general rule, the white hairs which intrude themselves as age advances, are coarser than the hairs among which they are found, suggesting the inference, that deficiency of pigmentary is compensated by excess of albuminous principle.

The most extensive range in thickness is enjoyed by light brown hair. The average measurements of hairs of different colors are as follow:

Flaxen,	$\frac{1}{350}$ to $\frac{1}{400}$ of an inch.
Chestnut,	$\frac{1}{325}$ to $\frac{1}{350}$ "
Red,	$\frac{1}{450}$ to $\frac{1}{400}$ "
Dark brown,	$\frac{1}{500}$ to $\frac{1}{300}$ "
Light brown,	$\frac{1}{300}$ to $\frac{1}{250}$ "
White,	$\frac{1}{450}$ to $\frac{1}{300}$ "
Black,	$\frac{1}{400}$ to $\frac{1}{350}$ "

These observations accord with those of Whithof.

The hairs of different regions of the body of the same individual necessarily present some degree of variety of diameter; but the amount of variation is less than might have been anticipated, as may be seen by the following table, in which the average term is employed. The diameter of the hair of the head is given in the first line as a standard of comparison.

	Man, chestnut.	Man, black.	Man, brown.	Woman, brown.
Head,	$\frac{1}{325}$	$\frac{1}{350}$	$\frac{1}{400}$	$\frac{1}{250}$
Beard,	$\frac{1}{200}$	$\frac{1}{200}$	—	—
Eyebrow,	$\frac{1}{250}$	—	$\frac{1}{300}$	—
Pubes,	$\frac{1}{300}$	$\frac{1}{250}$	—	$\frac{1}{200}$
Breast,	—	$\frac{1}{250}$	$\frac{1}{400}$	$\frac{1}{400}$
Whiskers,	$\frac{1}{300}$	$\frac{1}{200}$	—	—
Eyelashes,	—	$\frac{1}{300}$	—	—
Axilla,	$\frac{1}{450}$	$\frac{1}{300}$	—	$\frac{1}{300}$
Thigh,	—	$\frac{1}{400}$	—	—
Leg,	$\frac{1}{500}$	$\frac{1}{450}$	—	—
Vibrissæ auris,	$\frac{1}{1250}$	—	—	—

Upon the greater part of the body the hairs are very minute (downy hairs, lanugo), and in many situations are not apparent above the level of the skin; in others, as upon the outer sides of the limbs, they attain a certain length; and, upon the head, face, pubes, perinæum, axillæ, and around the nipple, their length is considerable. When left to its full growth, as it is in the female, the hair of the head attains a length of from twenty inches to a yard, the latter being regarded as unusually long; but in an instance that lately came under my notice, the hair measured six feet. The hair is known, besides, to constitute a sexual character, appearing for the first time on certain parts of the body at the period of puberty, and occurring on regions of the body of the male where it is generally imperceptible in the female, as upon the sides of the face, the chin, the breast, the shoulders, and the abdomen.

The free extremity or point of a hair is conical, and more or less sharp. When examined in one of the minute or downy hairs which has not risen above the level of the surface, the point appears obtuse, on account of its little difference in diameter from that of the shaft (Plate III., fig. 18). In the short hairs of the body and on the head, on the other hand, the point is apparently sharper, from the greater relative size of the shaft, and actually so as a consequence of dessication. The pointed character of a hair is very perceptible in the eyebrows and eyelashes, as also in the vibrissæ of the nose and meatus auditorius. When the hair has been cut, its pointed character is necessarily lost. Sometimes, however, there is an appearance of pointing,

the combined result of attrition and dessication. But the more usual character, when the hair has been long neglected, is a splitting of the end into two or three filaments.

The root of a hair, or that part which is included within the skin, inclosed in the hair-sac or follicle, is somewhat greater in diameter than the rest of the shaft, in consequence of being nearer the source of the nutritive fluids, and protected from evaporation: and for the same reasons it is cylindrical in form, while at its lower part the root expands into an oval-shaped mass, the bulb, which occupies the whole breadth of the follicle, and is implanted on a small elongated papilla, derived from the fundus of the follicle, the papilla of the hair. When a hair is cast, no trace of the bulb is perceptible, because the soft cells of which it is composed are dried up, and only those cells remain which have undergone transformation into the horny fibres of the hair. In this state the root of the hair is pointed, and resembles an old paint-brush worn to a conical stump (Plate III., fig. 18). But when it is torn out by force, it presents a variety of appearances, depending on the removal with it of more or less of the epidermal lining of the follicle, the root-sheath. Sometimes this follicular root-sheath is collected in a mass at the extremity of the hair, and the latter appears, in consequence, to be bulbous. Sometimes the epidermal sheath is drawn to a greater or less extent beyond the root, and then, according as it is straight or curved in direction, the root has the appearance of being pointed or uncinated.

In structure, a hair is composed of three different modifications of tissue (Plate IV., fig. 3), namely, a loose cellulated tissue, which occupies its centre, and constitutes the medulla or pith; a fibrous tissue, which incloses the preceding, and forms the chief bulk of human hair; and a thin layer, the so-called cuticle, which envelops the fibrous structure, and forms the smooth external surface of the hair.

The medulla is absent in the minute or downy hairs, and is not unfrequently absent or small in quantity in fine hairs, from whatever region they are selected. In the coarser hairs of the head and body, on the other hand, it is always present, and is especially remarkable in white hair. It varies in breadth from a mere line to a cylindrical body of one-third the diameter of the hair (fig. E), and is composed of large nucleated cells, of a globular or oval figure, filled with granules, and packed together, apparently without order. When newly formed, these cells, with their granules, are distended with fluid, but in the shaft of the hair the cells frequently contain air, which, from its highly refractive powers, gives the medulla a dark appearance when examined with the microscope. Varieties in structure of the hair are unusual; I have, however, once observed the presence of two medullæ. The displacement of the medulla nearer to one side of the periphery of the hair than to the other, in the short and thick hairs of the body, is not uncommon.

Fig. E.

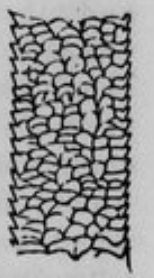
The middle or fibrous layer of the hair is composed of oval-shaped cells, closely packed together, and arranged in a linear order. These cells are identical in structure with the cells of the deep stratum of the

epidermis, 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 character of fibres. The hair-fibres offer some variety of appearance, according to the focus in which they 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. In different hairs these three appearances are seen with various degrees of distinctness.

The color of hair appears to reside partly in the granules and partly in an intergranular pigmentary substance which occupies the interstices of the granules and of the fibres. The most deeply-colored granules are those which constitute the nuclei of the cells, and in the lighter hairs these alone give color to the fibrous structure. In the darker hairs more or less of the peripheral granules are also colored, and pigment may be observed in greater or less abundance in the interfibrous spaces. With respect to the granules, the pigment appears to occupy their periphery, sometimes surrounding them completely, and sometimes occupying a portion only of their surface. In the peripheral granules of the cells, the outer segment is the more frequent seat of the pigment, while many are entirely destitute of that element. This total absence of color, in many of the granules composing even the blackest hair, gives to the fibrous structure, when examined with the microscope, an interruptedly streaked appearance (Plate IV., fig. 2); and the irregular intermixture of pigment granules with colorless granules, bestows upon the tissue between the streaks a dotted character. In red hair the granules have a delicate golden yellow tint, while the pigmentary matter is amber-colored. In the white hair of Albinoes and of the aged, the pigment is wanting.

The external layer or cuticle of the hair is a thin and transparent envelope, measuring in the hairs of the head about $\frac{1}{8000}$ of an inch in thickness. It is transparent and homogeneous, but is marked externally by undulating and jagged lines, which represent the edges of quadrangular non-nucleated scales or plates, which overlap each other from the root to the point of the hair. The overlapping border of the scale is notched and convex, and forms a slight projection beyond the level of the surface. Seen with the microscope, the prominent edges of the scales have the appearance of undulating and jagged lines, which cross at right angles the shaft of the hair (Fig. F). The prominence of the edges of the superficial scales of a hair is the cause of the sensation of roughness

Fig. F.



which we experience in drawing a hair between the fingers from the point towards the root, a sensation which is not perceived when the direction of the hair is reversed. It explains, also, the circumstance of hairs occasionally working their way into wounds, beneath the nails, and into the gums. In the hairs of the axillæ the external layer is generally more or less split up into fibres, which give it a shaggy appearance. Sometimes this appearance occurs only on one side of the hair, or more on one side than the other, while at others it is equally conspicuous around the entire shaft. It forms a remarkable distinctive character of the hairs of this region, and is due, as I believe, not to original formation, but to their saturation with the perspiratory fluid and the breaking up of the scales of the cuticle by softening and constant attrition. In the neighborhood of the bulb, the two portions of the cuticle of the hair, now described, namely, the outer scale-formed layer and the inner transparent layer, are distinguishable from each other as separate structures, and are peculiarly interesting, from illustrating the homology of hairs and teeth; the transparent part of the cuticle of the hair being, according to Huxley, homologous with the enamel of a tooth; and the squamous layer, which is essentially the basement membrane of the papilla of the hair, with the corresponding membrane of the pulp of a tooth, and described by Nasmyth under the name of "persistent capsule."

The hairs are implanted at a variable depth within the skin, and are maintained in their position by means of their follicles. The depth of implantation of the hairs of the head is between $\frac{1}{10}$ and $\frac{1}{20}$ of an inch, their bulbs being situated in the deep stratum of the corium, and frequently extending into the subcutaneous adipose tissue. The hairs of the whiskers, beard, and pubes, are commonly prolonged beyond the corium, while those of the general surface rarely exceed its mid-depth. The depth of implantation of the hair of the pubes is the same as that of the hairs of the head.

The follicle of the hair, or hair-sac, is a tubular canal excavated in the substance of the derma and lined by a thick layer of epidermis. It consequently presents the same structures that enter into the composition of the skin, namely, an epidermal lining or sheath, commonly called the root-sheath from its intimate relation with the root of the hair; the basement membrane of the corium, known as the structureless membrane of the hair-sac; and two fibrous layers, one consisting of fibres with transversely arranged columnar nuclei (Kölliker's layer); and an exterior membrane, consisting of longitudinal fibres and nuclei, into which the muscles of the hair-sacs, the arrectores pilorum, are inserted. This latter layer also contains a plexus of bloodvessels, together with the filaments of nerves, and supplies the means of nutrition to the root-sheath and its contained hair. The epidermal layer or root-sheath is composed of several strata of cells, which, having each a different arrangement, are regarded as distinct membranes; the most external of these, corresponding with the rete mucosum of the epidermis, presents a stratum of cells of which the long axis is transverse; this is the outer root-sheath; next follows a stratum, of which the cells have a longitudinal arrangement and have

no nuclei, this is the inner root-sheath of Henle; while, lining the latter, is a third layer, composed of cells with nuclei also arranged longitudinally (Huxley's layer).[1] The epidermal layer is nearly as thick as and often thicker than the hair which it incloses, and lies in close contact with the latter to the fundus of the sac and base of the papilla pili.

The hair-follicle or hair-sac terminates inferiorly in a slightly dilated cœcal pouch, and from the centre of the fundus of this pouch there projects into its cavity a dermal papilla of an ovate form, the broad end of the papilla being free, and the smaller end continuous with the substance of the derma external to the sac. This is the papilla of the hair, the hair-pulp, or hair-germ, or blastema pili; it is identical in structure with an ordinary dermal papilla, only differing in size, in form, in position, and in the absence of capillary vessels. The hair-papilla measures between $\frac{1}{8}$ and $\frac{1}{40}$ of a line in length, by $\frac{1}{11}$ to $\frac{1}{20}$ of a line in breadth;[2] and is surrounded by the elements of the future hair, which are round nucleated cells, more or less charged with pigment, and about $\frac{1}{4000}$ or $\frac{1}{5000}$ of an inch in diameter. As these cells are traced higher into the root of the hair, they become elongated and gradually metamorphosed into the permanent structures of the hair, the fibrous cortex and the still cellular medulla. The researches of Mr. Huxley have tended to establish an identity of nature and design, in other words, an homology between the hair and a tooth; and to prove that as a tooth is a product of the corium of the mucous membrane, so also is a hair the product of the corium of the skin; and that as the pulp of the tooth is metamorphosed into ivory, so the papilla or pulp of the hair-bulb is metamorphosed into the fibrous cortex of the hair—the cuticle of the hair representing the enamel of the tooth, and the medulla of the hair the cavitas pulpæ.[3]

Growth of the hair is accomplished by the successive formation of new cells in the superficial portion of the papilla of the hair, and these cells are gradually moved onwards and converted into the fibrous tissue of the hair, while new cells are produced to supply their place. As this metamorphosis takes place, the cells in course of conversion into the fibres of the hair become elongated, while their lateral diameter is correspondingly reduced, and the newly-formed root of the hair is consequently smaller than the bulb. Probably the fluids of the metamorphosed cells are transmitted onwards into the shaft of the hair, and so tend to its nutrition and health. The energy of growth of the hair offers considerable diversity; it is more active in youth than in age, in summer than in winter, in hair which is cut than in that which is left to its natural growth, and in hair that is frequently cut than in that which is cut but seldom. In a young person of feeble constitution recently shaved, I found the hair of the head to have grown four lines in three weeks, showing that the amount of growth is probably more than a line in the course of the week. Berthold[4]

[1] Kölliker's Manual of Human Histology, vol. ii. [2] Kölliker.

[3] On the Development of the Teeth and on the Nature and Import of Nasmyth's Persistent Capsule. Microscopical Journal, vol. i., 1853, p. 149.

[4] Müller's Archiv. 1850.

ascertained that in young females between the age of sixteen and twenty-four, the growth was seven lines in the month. He also showed by his observations that the hair grew the quicker for being frequently cut; that the beard shaved every twelve hours grew at the rate of five inches and a half to one foot in the course of a year; that when shaved every twenty-four hours, it grew at the rate of five to seven inches and a half; and that shaved every thirty-six hours, it grew only four to six inches and a half during the same space of time. He also found that the hair grows one-sixteenth faster by day than by night, and more quickly in the summer than the winter time. Whithof calculated that the hair of the beard grows at the rate of one line and a half in the week; equivalent to six inches and a half in the course of a year, or twenty-seven feet in a lifetime of eighty years. And Eble informs us that in the Princes' court at Eidam, there is a full length painting of a carpenter whose beard was nine feet long.

It is by no means uncommon to find two hairs, and sometimes three, issuing from the aperture of one follicle; but at a short distance below the level of the epidermis, such a follicle would be found to divide into separate tubules for each hair. Within the nose I have counted as many as ten hairs issuing in this manner from a common follicle, but below the surface there were always as many tubules as hairs.

In a healthy state of the skin the space between the epidermal lining of the follicle and the hair is very trifling. Indeed, it is merely sufficient to receive the exfoliated scales of the former, which are to be conveyed with the growing hair to the exterior. At a short distance (about half a line from the surface) within the derma, however, the space enlarges, in consequence of the junction with the follicle of one, two, or more excretory ducts of sebiparous glands, and the consequent stream of sebaceous substance which is poured into it. It is in this part that the entozoa of the hair follicles are chiefly found.

Mandl entertains some peculiar views with regard to the structure and mode of growth of hair. He describes a hair as consisting of a cortical portion, which is cellular, and a medullary portion, which is tubular. Through the latter, he conceives that the fluids of the hair ascend, and are deposited at the free extremity of its shaft, in successive layers, each layer becoming gradually smaller in diameter, until the hair eventually assumes the form of a fine point. This structure, he says, is indicated on the tapering extremity of a hair by a series of annular lines. The mode of growth here described he believes to be proved by the production of a pointed end upon hairs which have been cut, and also by the whitening of hair which sometimes commences at the point. The latter fact he explains by the transmission of colorless fluids to the end of the hair. Besides this mode of increase, he admits that another takes place at the root by apposition. I have convinced myself that Mandl is in error with regard to this hypothesis. Growth never takes place at the point of the hair, and, consequently, the hair cannot *grow* white at the point. It may exhibit indications of bleaching in that situation, from external

conditions sooner than in the rest of the shaft, but the process is purely physical. Again, the annular lines to which this author refers are simply the margins of the overlapping scales of the cuticle of the hair, the scales being smaller and less jagged in that situation than on the shaft of the hair.

The hair-follicles are not situated perpendicularly, but obliquely in the skin, hence the direction of the hairs, after their escape from the follicles is in the same sense inclined towards the surface; and the "set" of the hair, from the root to the point, is governed by a law as precise as that which regulates any other of the secondary vital functions. Thus, on the head, the hair radiates from a single point, the crown,[1] to every part of the circumference, making a gentle sweep behind, towards the left, and in front, to the right. The direction of this sweep is naturally indicated on the heads of children, and is that in which the hair is habitually turned. On the forehead the downy hairs proceed from the middle vertical line, with a gentle curve to the right and left, sweeping downwards to the situation of the whisker, and forming, by their lower border, the upper half of the eyebrow. Occasionally, the line of divergence of the forehead is oblique in its direction, running from the left of the forehead to the root of the nose. At the inner angle of each eye is situated another radiating centre, like that of the crown of the head; and a vertical line of divergence is continued downwards from this point, by the side of the nose, mouth, and chin, to the under part of the latter, where it curves inwards to the middle line. The upper and inner rays from this centre ascend to the line, between the eyebrows, where they meet those which are proceeding from the opposite centre, and those, also, which are diverging from the vertical central line of the forehead; so that here a lozenge is formed, which is the point of approximation of hairs from four different quarters. It is this circumstance that gives to the hairs of the inner end of the eyebrows a direction towards the middle line; and occasionally we see instances in which, from the unusual development of these hairs, the eyebrows meet at the base of the forehead, and form a little crest, for a short distance, along the root of the nose. The lower and inner rays from the angle of the eye diverge from the preceding, and are directed downwards and inwards upon the side of the nose; when strongly developed, they meet those of the opposite side on the ridge of the nose, and at their point of divergence from the ascending current necessarily form another lozenge. This latter is a lozenge of divergence, that of the forehead being one of convergence. The upper and outer rays from the angle of the eye curve along the upper lid, forming, by their upper margin, the lower half of the eyebrow, and at the outer angle of the eye being lost in the converging currents of the whisker. The lower and outer rays from the centre at the angle of the eye, together with those from the vertical line of the side of the nose, mouth, and chin,

[1] Sometimes there are two crowns, as in a little girl now before me, in whom the sweep from the left crown is to the left, and the right to the right, so that the hairs from the two crowns converge and meet in a crest along the middle line of the head.

make a gentle sweep over the cheek, side of the face, and jaw, to be lost, the upper ones in the front of the whisker, the middle rays, after passing beneath the ear, in the middle line of the back of the neck, and the lowest rays in the angle or bend of the jaw, in which latter situation they come into opposition with an ascending current from the chest. The rays from the inner margin of the vertical line of the side of the nose, mouth, and chin, are directed inwards upon those parts. On the upper lip they are met by a current directed from the apertures of the nose, outwards, and forming the sweep of the mustachio; a similar disposition is observed in the middle line of the lower lip, near its free edge, while the beard is formed by the convergence of two side currents meeting at the middle line. The current from the side of the head divides at the ear, those which pass in front of that part, and some, also, from the skin before the ear, contributing to form the posterior border of the whisker, and then passing backwards beneath the ear, with the current from the face, to the middle line of the nape; while those which pass down behind the ear converge with those from the back of the head also to the middle line of the nape.

On the trunk of the body there is a centre of radiation from each armpit, and two lines of divergence, one of the latter proceeding horizontally to the middle of the front of the chest, the other from this horizontal line, just in front of the axilla, vertically along the side of the trunk, across the front of the hip, and down the inner side of the thigh to the bend of the knee. From the axillary centre, and from the upper side of the horizontal line, a broad and curved current sweeps upwards and inwards over the upper part of the front of the chest, and outwards, around the neck to the middle line of the nape, the outermost part of the current passing over the shoulder to the middle line of the back. From the lower side of the horizontal line, and from the front of the upper half of the vertical line of the trunk, the set of the current is downwards and inwards, with a gentle undulation to the middle line, and from the lower half of the vertical line of the trunk, the direction is upwards towards the middle line and umbilicus, so that the latter is the centre of convergence of four streams from the anterior aspect of the abdomen, two from above and two from below. From the centre, at the axilla and posterior border of the vertical line of the trunk, the current streams downwards and backwards, also with an easy undulation, to the middle line of the back. The inner extremity of the horizontal line of the chest is the seat of a lozenge of divergence, and that of the line of the bend of the lower jaw, at the front of the neck, of a second.

From the axillary centre just described there proceeds another line of divergence, which encircles the arm like a bracelet, immediately below the shoulder. From the upper margin of this line the direction of the current is upwards over the shoulder, and then backwards to the mid-line of the back. Another line commences at this ring on the front part of the arm, and runs in a pretty straight course to the cleft between the index finger and thumb on the back of the hand: this is the line of divergence of the arm; from it and from the ring the stream

sets, at first, with a sweep forwards, and then with a sweep backwards to the point of the elbow. In the forearm the diverging currents sweep downwards in front, and upwards behind, also tending to the point of the elbow, which is thus a centre of convergence; while on the back of the hand and fingers the sweep outwards, with a curve having the concavity upwards, is quite obvious.

On the lower limb there are two vertical lines of divergence; the one being the continuation of that of the side of the trunk, proceeding around the inner side of the thigh to the bend of the knee; the other, an undulating line, beginning at about the middle of the hip, running down the outer side of the thigh to the bend of the knee, then continuing down the outer side of the leg, reaching the front of the ankle, and terminating on the foot at the cleft between the great and second toe. A short oblique line connects the two vertical lines at the bend of the knee. On the front of the thigh the streams from the two lines converge, and descend towards the knee. On the back they converge also at the middle line, but ascend towards the trunk of the body. On the leg, where there is but one line, the diverging currents sweep around the limb, and meet upon the shin, while on the foot they diverge with a sweep as upon the back of the hand.

Quantity of hair has reference to the proximity of the follicles, and also to the number of follicles which open by one common aperture on the skin. Whithof counted the number of hairs on a square inch of skin, and found of black, 588; chestnut, 648; and flaxen, 728. A similar investigation was made by Jahn in the person of an unusually hairy man, twenty-eight years of age. In a given extent of skin in this person he found on the

Summit of the head,	321 hairs.
Back of the head,	242 "
Front of the head,	238 "
Chin,	52 "
Pubes,	45 "
Forearm,	31 "
Outer border of hand,	20 "
Front of thigh,	21 "

In four years after this calculation was made, the man having married in the meantime, the number was diminished on all parts of the body, with the exception of the chin and pubes, where they had increased, on the former seven, and on the latter five.

In my own observations directed to this point, I ascertained that the number of hair-pores in the scalp of a man twenty-five years of age, having black hair, amounted in the square inch to 744. Now, supposing each pore to give passage to a single hair only, this number would represent the amount of hairs growing on a superficial square inch of the skin of the head; and, as the extent of surface of the scalp is about one hundred and twenty superficial square inches, the number of hairs on the entire head would amount to 89,280, or in round numbers to 90,000. This calculation, however, has reference only to a thin head of hair, for many of the pores give passage to two hairs; and, supposing this to be the case with one-half, we should then have as the number of hairs in a superficial square inch, 1116; and upon

the entire head 133,920. Or, supposing, as would probably be the case, in a thick head of hair, that every pore gave forth two hairs, the number in an inch would then be increased to 1488, and the total number for the whole head to 178,560; nearly two hundred thousand. As an average, therefore, of the number of the hairs of the head, I think we may fairly take the number in a superficial square inch at 1000, which would give us the number on the entire head 120,000.

Looking back on the structure of the hair, we cannot but be forcibly impressed with the perfection of organization which it exhibits; and this feeling is increased when we reflect on the elasticity and strength of so delicate and slender a thread. The former of these properties, tested by the experiments of Weber, has been referred to at page 56. A single hair of a boy eight years of age, says Robinson, in his "Essays on Natural Economy," supported a weight of 7812 grains; one of a man, aged twenty-two, 14,285 grains; and the hair of a man of fifty-seven, 22,222 grains. Muschenbroeck found that a human hair fifty-seven times thicker than a silkworm's thread would support a weight of 2069 grains, and a horsehair, seven times thicker, 7970 grains. The strength of the hair is due to its fibrous portion, for hairs deficient in this structure, like those of the fallow deer, are remarkable for their brittleness.

The development of hair has been made the subject of research by Heusinger, Simon,[1] and other physiologists. The earliest trace of the hair rudiments is perceptible at the twelfth week of embryonic life, and of the hair itself at the eighteenth week. These early traces are found in the eyebrow, and are followed successively by similar appearances on the head, back, chest, and extremities, so that by the end of the sixth month hair may be met with on the whole body, with the exception of the hands and parts of the forearm and leg. Development of the hair commences by the formation of small globular masses, resembling buds, on the under surface of the rete mucosum. These buds grow inwards into the corium, and after a time have the appearance of flasks, composed of nucleated cells, identical in structure with those of the rete mucosum. Subsequently the central cells become elongated in form, darker colored than the peripheral cells, and separate from the latter; and at a still later period, the central cells are metamorphosed into a hair and inner root-sheath, while the external cells become transverse in their position, and are converted into the outer root-sheath, around which are developed the three membranes of the hair-sac. It follows, therefore, that the primitive hair does not grow, as in its subsequent existence, but is developed, in all its completeness, with a point, a shaft, and a bulb, and that at the same time with the growth inwards of the flask-shaped process of the rete mucosum, a papilla is developed from the corium, and grows outwards to penetrate its fundus, and develop the first trace of the future hair. Two movements of growth are therefore established—a growth inwards of the hair rudiment, and a growth outwards of the

[1] Zur Entwickelungsgeschichte der Haare. Von Dr. Gustav Simon. Müller's Archiv., 1841.

papilla and hair. The point of the hair is in this way brought to the surface of the epidermis, and bursting through the cone of the inner root-sheath, is developed as a free hair. Simon has described the young hair as being bent upon itself, so that the point and the bulb are approximated, and the young hair as making its way through the aperture of the follicle in the form of a loop.

In the human embryo, the lanugo infantium begins, therefore, to be apparent during the first half of the fifth month of intra-uterine existence, upon the eyebrows, upper lip, and around the mouth; and at about the middle of the month upon the head. By the end of the sixth month it is pretty general over the whole body, the last parts on which it is seen being the backs of the toes and fingers, the ear, and the nose. At the sixth month Eble found the hairs of the head to measure three lines, those of the eyebrows two lines, and the eyelashes half a line. At birth the fœtus is covered with a thick down, the minute hairs being pale, and without color, and in their structure consisting only of cortical substance and cuticle. It is at this period that we have the best opportunity of observing the direction of the hairs; for during the first year the greater part of these temporary hairs have been shed, and they are succeeded by a more permanent kind, which appear upon the surface only in certain situations. At the period of adolescence the hairs acquire a new impulse of growth in co-relation with the more active development of the frame; and when the powers of the system are on the wane, the hair is among the first of the organs of the body to evince an associated infirmity.

The process of shedding and renewal of the hair has been observed by Kölliker in the eyelashes of a child a year old, and has since been seen in operation in other regions of the body. It is simply a repetition of the phenomena of development of the hair already described, but taking place from the fundus of a hair-sac instead of from the surface. The cells of the root-sheath protrude, and form a bud, and the bud gradually elongates in the deeper layers of the corium, carrying with it the hair-sac, and having inclosed in its mass a hair papilla. On attaining a certain length, the central and peripheral cells assume a difference of character—the former acquiring pigment and a longitudinal prolongation; the latter remaining clear, and becoming transverse; the former undergoing metamorphosis into hair and inner root-sheath, the latter into outer root-sheath. Subsequently, growth outwards begins to be active; the old hair is moved onwards to the surface, and ejected through the aperture of the follicle; while the new hair bursts its enveloping sheath, and takes the place of its predecessor. By this mode the downy hair of the infant, the lanugo infantium, is replaced by the permanent hair by which it is succeeded; but it is doubtful whether this process of renewal is continued after the period of infancy. It is obvious that it may occur, and may be one mode of reproduction of the hair; while, on the other hand, it is known that the common mode of reproduction of the hair, when a hair has fallen or been removed by violence, is the regeneration of the original papilla, or the restoration of its normal functions.

In chemical composition hair is found to differ from epidermis and

horn, and also from albumen and fibrin. Its chief constituents are an animal substance, a modification of protein, apparently a compound of protein and sulphur, a certain quantity of fat, some pigment, and certain mineral and earthy salts, among which are iron, manganese, and silica—the quantity of ash varying between one and two per cent.

According to the analysis of Vauquelin, the chemical constituents of hair are—animal matter, in considerable proportion; a greenish black oil; a white, concrete oil, in small quantity; phosphate of lime; carbonate of lime, a trace; oxide of manganese; iron; sulphur, and silex. Red hair contains a reddish oil, a large proportion of sulphur, and a small quantity of iron. White hair, again, exhibits a white oil, with phosphate of magnesia. The white hair of old persons contains a maximum proportion of phosphate of lime.

The ultimate analysis of hair, according to Scherer,[1] exhibits the principal elementary constituents in the following proportions:

Carbon,	50.652
Hydrogen,	6.769
Nitrogen,	17.936
Oxygen, Sulphur,	24.643

Fair hair contains the least carbon and hydrogen, and most oxygen and sulphur; black hair follows next; while brown hair gives the largest proportion of carbon, with somewhat less hydrogen than black hair, and the smallest quantity of oxygen and sulphur. The hair of the beard was found to contain more carbon and hydrogen than the hair of the head, and less oxygen and sulphur. The quantity of nitrogen is the same in all.

NAILS.

The NAILS are horny appendages of the skin, identical in formation with the epidermis, but peculiar in their mode of growth. A nail is convex on its external surface, concave within, and implanted by means of a root into a fold of the derma (vallecula unguis), which is nearly two lines in depth, and acts the part of a follicle to the nail. The surface of the corium, on which the nail rests, is termed its matrix or bed, and the prominence which surrounds it and overlaps it on its two sides and at its root is the wall of the nail. The surface of the matrix is marked by longitudinal ridges, which increase in depth from the root towards the extremity, and in the fundus of the fold are several rows of transverse ridges; the ridges are studded with minute papillæ, which are the active agents in the growth of the nail. The papillæ of the fundus of the follicle produce the margin of the root, and by the successive formation of cells push the nail onwards in its growth. The concave surface of the nail is in contact with the derma, and the latter is covered with laminæ, which perform the double office of retaining the nail in its place, and giving it increased thickness, by the addition of newly-formed cells to its under surface. It is this constant change occurring on the under surface of the nail, co-operat-

[1] Liebig, Organic Chemistry.

ing with the continual reproduction taking place along the margin of the root, which insures the growth of the nail in the proper direction. For it is clear that if the adhesion of the concave surface of the nail with the derma were not perfectly soft and yielding the addition of successive layers of cells to the follicular margin would be wanting in the force necessary to push it forward in the direction of its growth.

The nail derives a peculiarity of appearance from the disposition and form of the laminæ upon the ungual surface of the derma. Thus, beneath the root of the nail, and for a short distance onwards towards its middle, the derma is covered with ridges, which are more minute, and consequently less vascular, than the laminæ somewhat further on. This patch of ridges is bounded by a semilunar line, of which the concavity is turned towards the root, and in consequence of appearing lighter in color than the rest of the nail, has been termed the *lunula*. Beyond the lunula the laminæ are raised into longitudinal plaits (Plate II., figs. 4, 5), which are exceedingly vascular, and give a deeper tint of redness to the nail. These plait-like laminæ of the derma are well calculated by their form to offer an extensive surface, both for the adhesion and formation of the nail. The granules and cells are developed on every part of their surface, both in the grooves between the plaits, and on their sides, and a lamina of nail is formed between each pair of plaits. When the under surface of a nail is examined, these longitudinal laminæ, corresponding with the longitudinal plaits of the ungual portion of the derma, are distinctly apparent; and if the nail be forcibly detached, the laminæ may be seen in the act of parting from the grooves of the plaits. This laminated structure upon the internal surface of a nail is seen in a magnified form in animals; for instance, in the perpendicular wall of the hoof of the horse. Moreover, it is this structure that gives rise to the ribbed appearance of the nail, both in animals and man. The surface of the derma which produces the nail, the matrix of the nail, is continuous around the circumference of the attached part of that organ with the derma of the surrounding skin, and the horny structure of the nail is consequently continuous with that of the epidermis.

That nothing may be wanting to complete the analogy between the structure of the nails and that of the epidermis, pigment granules are found entering into their composition. The grayness of hue which the nails of some persons exhibit is due to the presence of this element, and upon a microscopic examination of a section of the nail, the granules may be observed in greater or less number disseminated in streaks amongst the horizontal strata of which the nail is composed. Pigment is also found in the deeper cells of the nail of the negro. The only difference in structure that has been noted between the epidermis and the nail, is the persistence of the nucleus of the cells of the latter. While in other respects, the cells of nails undergo a more complete condensation and solidification as a consequence of their mode of growth, and probably of a more active nutrition. When kept pared, nails have a constant and active growth, but when left to themselves they attain a certain length and then cease to grow; as we see in bedridden persons, and amongst those nations of the East, as amongst the

Chinese, who permit the growth of the nail to its full extent. A French physician, Dr. Beau,[1] has found that the nails of the feet were four times slower in their growth than those of the hands. The latter increased in length one millimetre, that is, two-fifths of a line, in one week; while the nails of the foot required four weeks for the same amount of increase. According to this observer, the length of the thumb-nail, including the root, which is hidden from sight, is eight lines, that is, twenty millimetres; consequently, the period occupied in the growth of that nail would be twenty weeks or five months. In like manner, the nail of the great toe, measuring in length nine lines and a half, or twenty-four millimetres, and requiring four times the period of the thumb-nail, would consume ninety-six weeks, that is, nearly two years, in its growth.

Dr. Beau has further remarked, that during the continuance of every constitutional disorder the nails suffer to a greater or less extent. According to him, the law of growth of the nails is precisely the same both in health and disease (an assumption which, although not strictly true, approaches sufficiently near the truth to be admitted as a general proposition); but in the latter state, the materials of growth are supplied by the blood in diminished quantity. Hence, the portion of nail formed during the existence of disease will be perceptibly thinner than that produced during health, and may be distinguished on the surface as a transverse groove. If the disease have been sudden, the outer boundary of the groove will be abrupt, and *vice versâ*. And if the disease be one in which the nutritive functions are seriously affected, the depth of the groove will maintain a relative correspondence. Admitting these data, Dr. Beau suggests, as a practical application of his observations, the possibility of determining the period of occurrence and also the period of duration of a disease, provided the time do not exceed that required for the entire growth of the nail. For example: a groove, or rather ledge, situated at the distance of eight millimetres from the edge of the root of the thumb-nail, or five from the free margin of the skin, is indicative of an attack of disease which commenced eight weeks previously; while the breadth of the groove being two millimetres would prove the disease to have continued for the space of two weeks. After five months the thumb-nail ceases to be a telltale, on account of its entire growth in length being accomplished, and the vestige of diseae consequently obliterated. The great toe-nail, however, may now be appealed to. At five months the groove indicative of the above disease has advanced only five millimetres from the root, and is only just becoming apparent beyond the free margin of the skin, the breadth of the groove being only half a millimetre. In making these observations, M. Beau selects the thumb-nail and corresponding nail in the foot, because in them only he finds the appearances regularly present.

To put Dr. Beau's observations to the test of experiment, I noted an illness which took place in myself, commencing on the 14th of December, and lasting for a fortnight. On the 1st of May following, I found,

[1] Archives Générales de Médecine, vol. x. p. 447.

across each thumb-nail, a groove measuring one line in breadth. Now, a line is equal to two and a half millimetres, and as the rate of growth, according to Dr. Beau, is one millimetre a week, my illness should have lasted two weeks and a half instead of two weeks. I therefore came to the conclusion that, either my own feelings of convalescence preceded the perfect restoration of the functions of nail-formation, or that the rate of growth of the nail was more rapid in me than in other persons. I next measured the distance between the distal margin of the groove and the epidermal margin at the root of the nail, and adding to that quantity three millimetres for the depth of nail concealed by the follicle, obtained as a result seventeen millimetres; in other words, a space representing seventeen weeks, whereas the real time was nineteen weeks and a half. This was exactly the reverse of my first observation, and went to prove that, in me at least, the growth of the nail was less rapid than is represented by Dr. Beau. Nevertheless, the experiment came sufficiently near the truth to render Dr. Beau's observations interesting and deserving of attention.

Fig. G.

A thumb-nail bearing the mark of a foregone illness. *a*. Is the edge of scarf skin which overlaps the nail at its root. *b*. The lunula. *c*. The groove occasioned by deficient formation during the period of the illness. *d*. The free extremity of the nail.

The development of the nail commences during the third month of embryonic life, by the prominence of the corium around the boundary of the future matrix of the nail; this prominence is the wall of the nail, which marks out a quadrangular area; and up to the end of the third month, the matrix is covered by ordinary epidermis. During the fourth month a harder layer is formed under the epidermis, and becomes gradually thicker and larger, until, in the seventh month, it protrudes its free edge. The nail is, therefore, developed originally under the epidermis, and at a later period only, assumes its external position. At birth, in consequence of the growth of the fingers, the nail is narrower at the free edge than elsewhere, and is commonly broken off, but the whole of the original nail is not worn away until the infant is six or seven months old.

In a chemical analysis of the horny tissue of nail, Scherer[1] found the elementary constituents in the following proportions:

Carbon,	51.089
Hydrogen,	6.324
Nitrogen,	16.901
Oxygen, Sulphur,	25.186

The chief nitrogenous element is protein with sulphamide; the amount of ash is the same as for epidermis, about one per cent., but there was more sulphur and carbon; and, according to Lauth, more phosphate of lime, giving additional hardness to the nail.

[1] Liebig, Organic Chemistry.

PHYSIOLOGY OF THE SKIN.

In a physiological point of view, the skin is an organ of sensation, absorption, and secretion; in the former capacity it supplies us with knowledge, affords us gratification, and warns us of the presence of injurious or destructive agents; by means of the second, it is enabled to appropriate the fluids contained in the surrounding medium, and perform the office of a respiratory organ; and by means of the third, it provides for its own softness and pliancy, regulates the influence of temperature, both external and internal, and acts as an important depurating organ of the blood.

As an organ of sensation, it endows us with the function of *touch*, of determining the qualities of objects by their properties of resistance, of extent, and of variety of surface. It enables us to distinguish between hard and soft, smooth or rough, hot or cold. And the education of this sense, effected by concentration of attention, and increased powers of appreciation and adaptation, enables the blind to read with the aid of their fingers, to trace the most minute variations of form or surface, and even to detect the mysterious tactile differences of colors.

The sensibility of the skin varies normally in different parts of the body; thus, it is greatest on the pulps of the fingers, and least in the middle of the limbs, as of the thigh and arm. This has been proved by the curious results of the researches of Weber, who applied the points of a pair of compasses to the skin, in various parts of the body, in order to ascertain the degree of sensibility of the skin in the perception of a double impression. Thus, upon the pulp of the middle finger, the two points were felt when only separated from each other to the extent of one-third of a line; on the palmar surface of the same finger it was necessary to separate them two lines; on the cheek, five lines; forehead, ten lines; on the middle of the breast, twenty lines; and on the middle of the arm and thigh, thirty lines. He observed, moreover, that the delicacy of perception was greatest in the direction of the branches of the nerves, as, transversely on the face and front of the neck, longitudinally on the fingers, &c.[1] The same author has pointed out some remarkable instances of differences in the perception of temperature; thus, he has shown that if the two hands be immersed in water of the same temperature, that in which the left is placed will feel the warmest, while the right is the most sensitive of touch; and again, that a weak impression made upon a large surface of skin, produces a more powerful effect upon the nervous system than a strong impression upon a small surface. This is practically illustrated by taking hot water and immersing the finger of one hand, and the entire of the other hand; the single finger will suffer no inconvenience from the heat, while to the hand it may be insupportable. For the same reason, the hand is better adapted than the finger to test the temperature of a bath before the immersion of the body; and even then it may be found that a heat which is pleasant to the hand may be intolerable to the entire skin. In pursuing the investigation of the

[1] I have repeated these experiments, and the results are truly surprising.

diseases of the skin, we find hourly instances in corroboration of these facts.

The sensibility of the skin is subject to considerable modification under the influence of disease; the natural sensibility may be heightened, or it may be diminished, or, again, it may be altered. These changes obviously depend on some modification of the nervous system, the nature of which is, for the present at least, beyond our grasp. The more common morbid sensations of the skin, in addition to heat and cold, are itching, tingling, smarting, pricking, shooting, creeping, tickling, burning, scalding, &c.; and it is to be remarked that these sensations are more acute in certain situations than in others, and that they are simple modifications of common sensation, and have no connection with the special tactile function of the skin; for example, the armpits, the sides of the body, and the soles of the feet, are the most sensitive to tickling, while the nipple is comparatively insensible to the pressure and friction of clothing, but is highly appreciative of touch.

By means of its absorbing power the skin is enabled to act as a respiratory organ. The impcrtance of this function in man is not sufficiently estimated, but in the lower animals it is universally acknowledged. The process of absorption in the skin is effected by an active endosmosis, which is more and more controlled by vital influence, as it reaches the strata of the epidermis most nearly in contact with the derma. This function of the skin is calculated to enact an important part in the health of the individual, in relation to the purity or impurity of the atmosphere in which he moves.

The absorbing power of the skin, in common with that of the mucous lining of the respiratory passages, is actively brought into play whenever the body has been exhausted of its fluids, and becomes a means of restoring their equilibrium. A gentleman, who was pursuing the practice of the Turkish Bath with great zeal, made at my request the following observations on himself, and repeated them many times with precisely similar results—and I may observe that identical results have attended the same experiment when performed by others. On entering the bath he was carefully weighed, and at the conclusion of the bath he was weighed again after having passed an hour in a dry atmosphere, heated to 180° degrees; he had lost a pound in weight. He then dressed and returned leisurely to his home, and after the lapse of two hours was again weighed. He had recovered the pound which he had lost in the bath; he had absorbed it from the atmosphere, for he had neither eaten nor drunk during the interval. The fact is somewhat startling, and teaches us the power of opposition which nature creates to recover an equilibrium which we too frequently set ourselves wilfully to disturb. It is a powerful argument against the excessive sweating which the promoters of the dry-air bath have so heedlessly encouraged. The real Turkish Bath is a bath of low temperature, about 120°, of which the atmosphere abounds in moisture, having rills of water streaming over its heated floor, and which therefore restores as quickly as it withdraws the watery fluids from the body—establishing, in fact, a cir-

culation in the aqueous fluids of the system, and changing its nature without altering its quantity.

When the body is immersed in water of a certain temperature, say 82° of Fahrenheit,[1] and a few degrees below, and allowed to remain in it some time, it increases in weight by absorption of the fluid. The fact is proved by the experiments of several physiologists. Westrumb[2] detected ferrocyanate of potash in the urine of a man who had taken a bath which contained that salt in solution; and D'Arcet found the urine of another alkaline who had bathed in the Vichy waters. Other experimentalists have succeeded in discovering coloring matters, such as rhubarb, in the urinary secretion after bathing in water containing such substances; and Fourcault observed that birds kept under water all but their heads, until they died, threw up a watery fluid from their stomach. Opposite results to these—namely, loss of weight by transpiration—take place whenever the temperature of the bath nearly approaches or exceeds that of the body. These experiments have another important bearing on the physiology of the skin, since they prove that the temperature of a bath which conduces to absorption has the effect of a sedative on the system, and diminishes the rapidity of the pulse; while the converse, acting as an excitant of exhalation, increases the frequency of the heart's pulsations.

The absorbent property of the skin is sometimes taken advantage of for the purpose of introducing nutritive matters into the system, and at others for the exhibition of medicinal substances. Some of the latter produce their characteristic effects when simply applied to the surface by means of a bath or poultice; but more frequently we find it necessary to resort to the additional aid of friction, and, moreover, we select those parts of the skin in which the epidermis is thinnest. The substances to be absorbed must be presented to the skin in a state of solution, or suspension in water or oil; but at the same time it may be granted that the quantity taken into the system is very small. The exhibition of medicinal substances by friction on the skin, termed the *Iatraleptic method*, is only adapted for the more powerful medicines, and is rarely employed at the present day, excepting in the instances of mercury, croton oil, strychnine, &c. The epidermis acts as an impediment to absorption, and as such, is an important safeguard against the admission of injurious and poisonous substances into the blood. Thus we find that it is only after long soaking, or by long-continued friction, that we are enabled to overcome this natural defence, and then only to a very partial extent. But when the epidermis is removed, the case is altogether altered. The derma is a highly absorbent tissue, and medicinal substances and poisons, when brought in contact with it, frequently act with as much rapidity and energy as when introduced into the stomach. On this account, the *endermic method*, as it is called, offers some advantages when medicines disagree with the alimentary canal, or are repelled with loathing by the patient. In the adoption of this method of administering medicinal agents, it is necessary to raise a blister in the

[1] Berthold, in Müller's Archiv. for 1838.
[2] Journal Hebdomadaire, No. 7.

most expeditious and least painful manner, unless there be an open wound already present, and then sprinkle the substance, in a state of fine powder, over the surface. It follows, therefore, that only such medicines can be administered in this manner as produce their effects in very small doses, such as strychnine, morphine, digitalis, belladonna, lead, mercury, &c. The absorbent power of the skin is sometimes painfully evinced in the inflammation of the kidneys which follows the application of a blister, in the constitutional effects resulting from the absorption of lead, or in those which succeed the use of arsenic to ulcerated surfaces.

An observation made by Mr. Ceeley[1] would seem to explain the accidental absorption of poisonous substances by the skin, without abrasion of the epidermis, and to prove that the confinement of its exhalation is an important auxiliary. Thus, he remarks, "I have often succeeded in procuring vaccine vesicles without puncture, on the skins of children especially, and young persons, by keeping lymph in contact with the skin, and excluding it from the air by a coating of blood. Active lymph blended with blood casually trickling down the arm, and drying in the most dependent part, will often give rise to a vesicle." In this case it is obvious that the lymph will become gradually dissolved in the perspiratory secretion, an important consideration in respect to the prolonged contact of poisonous substances with the skin.

The softness and pliancy of the skin are, in great measure, dependent on the secretion of the sebaceous substance which is poured out on every part of its surface. This secretion is most abundant in situations where, from the influence of physical action, the skin would be liable to injury were it deprived of a similar covering. Thus we find it in large quantities on the head and face, upon the trunk of the body, in the armpits, and in the perineum. The sebaceous secretion is an oleaginous fluid, containing water, stearine, oil globules, pigment granules, and salts, together with epidermal cells thrown off by the parietes of the glands and ducts. The secretion is modified in its qualities in different parts of the body; in some, by the presence of an odorant principle; in others, by a peculiarity in taste or color. Of the former is the butyric acid of the perineal region; of the latter, the yellowish brown and bitter product of the sebiparous glands of the meatus auditorius, the cerumen or ear-wax. In chemical composition sebaceous substance consists, according to Esenbeck,[2] of

Fat,	24.2
Osmazome, with traces of oil,	12.6
Watery extractive (salivary matter),	11.6
Albumen and casein,	24.2
Carbonate of lime,	2.1
Phosphate of lime,	20.0
Carbonate of magnesia,	1.6
Acetate and muriate of soda and loss,	3.7
	100.0

[1] Observations on the Variola Vaccina, in the Transactions of the Provincial Medical and Surgical Association, vol. viii.

[2] Gerber's General Anatomy, edited by Gulliver.

"The ear-wax is an emulsive compound which contains a soft fat, albumen, a peculiar extractive bitter matter, epithelium scales, lactate of lime, and an alkaline lactate, but no chlorides, and no phosphates soluble in water."[1]

The function of the skin as a regulator of the temperature of the body, and as a purifier of the blood, is effected by means of a peculiar secretion, the perspiration. When this secretion is eliminated in the form of an imperceptible vapor, it is termed *insensible*, and when condensed or poured out in a fluid state, *sensible* perspiration. The insensible perspiration is partly derived from the sudoriparous and sebiparous glands, and partly from the natural evaporation taking place from the epidermis. The sebiparous system has not been heretofore pointed out as a source of the perspiratory fluid, but frequent observation has convinced me that this apparatus plays an important part in the elimination from the system of the watery elements of the blood. Lavoisier and Seguin estimate the mean quantity of perspiration, both insensible and sensible, secreted by the skin in the course of twenty-four hours, at thirty-three ounces, while they assign to the pulmonary exhalation twenty-one ounces—making a total of fifty four ounces for both, or somewhat more than three pounds; while they set down the maximum at eighty ounces, and the minimum at twenty-one ounces. The experiments of Dr. Dalton furnished him with different results, since he attributes to the lungs an amount of exhalation five times greater than that of the skin.

In some experiments made by Dr. Southwood Smith[2] on the stokers of the Phœnix Gas Works, it was ascertained that the maximum loss of weight in men who had been at work in a high temperature for a period varying between three-quarters of an hour and an hour and a quarter, ranged between 2 lbs. 15 oz. and 5 lbs. 2 oz.—the lesser degree of loss occurring on a cold and foggy day—the greater on a warm, clear, and somewhat windy day; and that of two of the men placed in a bath of 95°, one recovered half a pound in weight in half an hour, and the other lost half a pound in the same space of time. The general results of Dr. Southwood Smith's experiments tend to show that the amount of perspiration—in other words, of loss of weight by perspiration—presents considerable variety in different men; that it presents considerable variety in the same individual at different times; that the subsequent absorption or recovery of the lost fluid presents equal variety; and that the amount of loss is greater on a warm and clear day than on a cold and foggy day.

The quantity of perspiration is altered by a variety of circumstances which affect the body physically, or through the agency of the nervous system. Of the former kind are the temperature, current, and hygrometric condition of the atmosphere, and stimulation of the skin; of the latter, excited or depressed nervous powers. When the temperature of the atmosphere is unusually elevated and the air dry, perspiration takes place with so much activity as to preserve the heat of the body at its natural standard. If, instead of being still, the

[1] Simon, Animal Chemistry, translated by Dr. Day.
[2] The Philosophy of Health, &c. 1837. Vol. ii., p. 391.

atmosphere pass over the surface in a current, the quantity of perspiration is still further increased, and the cooling influence is more felt. But if, with the same temperature, the atmosphere be loaded with moisture, perspiration is prevented, and the heat of the body becomes intense. The influence of stimulation in the promotion of perspiration is shown in the effects of exercise, the warm bath, diaphoretics, &c. Instances of the influence of the nervous system are exhibited in the total arrest of perspiration during the hot stage of fever, and of its great increase under emotions of a depressing kind, as fear and anxiety, and also in syncope. The perspiratory secretion possesses its highest amount of activity during digestion, while immediately after taking food it is at its minimum.

The secretion of perspiration is also modified by the greater or less activity of the other secretions, particularly of the lungs and kidneys, the functions of these organs being frequently vicarious with the skin, and *vice versâ*. Thus, during the summer, and in warm climates, the perspiratory secretion is augmented, while the exhalation from the lungs and the quantity of urine are diminished. In the winter and in cold climates the reverse is the case. On quitting a warm apartment, especially after indulging in stimulants, for the cold air, a sudden check is given to the cutaneous function, while that of the kidneys is suddenly and actively called into exercise. The same fact is observed in certain diseases; thus, the excessive sweats of phthisis may be regarded as vicarious of the diminished exhalation from the lungs, while diabetes is accompanied by a remarkably dry state of the skin. The arrest of perspiration again, from cutaneous disease, is often attended with serious congestions of the mucous membranes.

Of some experiments made by Dr. Lining in South Carolina, on the relative quantities of perspiration and urine during the warmer and colder months of the year, the results are as follows:[1]

	Perspiration.		Urine.
July, ...	86.41	...	43.77
May, ...	68.11	...	56.15
October, ...	40.78	...	46.67
February, ...	37.45	...	77.86

The influence of the perspiration in regulating the heat of the body is strikingly evinced in the numerous recorded instances of exposure of the person to elevated temperatures. Sir Charles Blagden supported a temperature of 260° for nearly ten minutes. The furnace in which Sir Francis Chantrey dried his moulds, and which was frequently entered by his workmen, is said to have been kept heated to a temperature of 350°; and the oven used by Chabert, during his exhibitions in London, was heated to betwen 400° and 600°. The thermometer placed in the mouth of a man who had been exposed to a temperature of 120° for a quarter of an hour, stood at 105°; and the temperature of animals when the heat has been raised to a degree sufficient to cause death, has never exceeded in elevation from nine to fourteen degrees above the natural standard.[2]

[1] Dr. Robley Dunglison on Human Health.

[2] It is interesting to note, that in animals made the subjects of these experiments,

The effort which is being made to introduce amongst us a bath similar to that used in the East, and in some measure resembling the ancient bath of the Romans, has afforded new illustrations of the effects of heat upon the animal economy, and of the powers with which we are endowed of resisting its influence. A temperature of 150°–180° of dry air to the naked skin is inexpressibly agreeable, if the amount of evaporation from the surface be nicely adjusted to the degree of temperature—that is, if the quantity of perspiration be sufficient, or somewhat more than sufficient, to carry off by evaporation every particle of heat which might act unpleasantly upon the sensations. But if the heat be greater in proportion than the quantity of perspired fluid—that is, if there be a less degree of moisture of the skin than is equivalent to the carrying off of the excess of heat—then a slight feeling of chill, as of a breath of cold air playing over the surface, is experienced, and the skin becomes red, dry, and parched. Persons who are unacquainted with the cause of this change are apt to express their wonder, that while they perspired freely in a lower temperature they had ceased to perspire in one that is considerably higher; whereas, in reality, they do perspire more abundantly in the higher temperature, but evaporation is rendered more active by the increase of heat.

In a temperature of 250° of dry air, I experienced no inconvenience for the first few minutes, whilst evaporation and temperature were nicely balanced. Soon, however, I felt faint and uncomfortable, in consequence of the excessive demand so suddenly made upon the watery fluids of the body; then, also, a chilly feeling seemed to travel over the surface of the skin, accompanied here and there with a dry parching sensation; the skin became dry, red, and congested; the heat had evaporated the moisture of my mouth and fauces, my throat felt dry; there was a dazzled sensation in my eyeballs, as though from congestion of its vessels; then followed a buzzing sound in the ears, apparently from the same cause, and at the end of ten minutes I was glad to put an end to the experiment.

In a damp atmosphere the cooling influence of the perspiration, is necessarily lost; and the effects upon the system of a prolonged exposure to a moist atmosphere at a high temperature have been recorded by a gentleman who recently visited the baths of Nero, near Pozzuoli, the ancient Posidianæ. To reach the bath he had to pass along a narrow, winding passage of about 120 yards in length, and 7 feet high, by about three in breadth. A little within the mouth of the passage the temperature was 104° in the upper strata of the atmosphere, and 91° near the ground; farther on, the air was filled

the blood was found in the opposite position to that which it would have occupied after death from cold. Instead of being collected about the heart and internal organs, as in death ensuing from the latter cause, the heart was empty, and the vital fluid dispersed towards the periphery of the body, in some instances being actually forced out of its vessels into the surrounding tissues. The blood seemed to have been killed by the heat, for it had lost its power of coagulating, and its deep black hue was not altered by exposure to the atmosphere—a change which takes place in living blood. In a moist atmosphere the animals died sooner than in dry air of a higher temperature and without losing weight; in dry air they lost weight.

with dense vapor, of a temperature of 118° above, and 111° below; and over the bath it was 122°, the heat of the spring being 185°. After proceeding for about one-third the length of the passage, he began to feel a sense of oppression and discomfort, his pulse rising from 70 to 90 beats in the minute. A short distance farther, the oppression increased, his breathing became rapid and panting, and he was under the necessity of stooping his head frequently to the earth, in order to obtain a chestful of air of a less suffocating temperature. His skin, at this time, was bathed in a profuse perspiration, his head throbbing, and his pulse beating 120 in the minute. Continuing his progress, the sensations of suffocation became insupportable; his head felt as though it would burst; his pulse was so rapid as to defy calculation; he was exhausted and nearly unconscious; and it required all his remaining power to enable him to hurry back to the open air. On reaching the mouth of the passage he staggered, and nearly fainted, and was very uncomfortable until relieved by a bleeding from the nose. During the rest of the day his pulse remained at 100; he had uneasy sensations over the surface of the body, and did not recover until after a night's repose. The same gentleman bore a temperature of 176° in dry air without inconvenience.[1]

The recent experiments of M. Fourcault[2] throw considerable light on the importance to health of the secreting function of the skin. These experiments were instituted for the purpose of illustrating a theory of the author, that suppression of cutaneous transpiration is a potent cause of chronic disease, and especially of scrofula and pulmonary consumption—diseases which he traces to the conjoint effect of a cold and damp atmosphere, and the absence of sufficient exercise to promote healthy perspiration. M. Fourcault endeavored to suppress the action of the skin in animals by means of an impermeable varnish; and, as a consequence of this operation, he caused vicarious congestion of the mucous membranes, and also of the serous membranes and nervous system. A horse had intense congestion of the mucous membrane of the nasal passages and a profuse discharge; sheep equally suffered with congestion of the Schneiderian membrane and coryza; while dogs were seized with inflammation of the bowels, and enlargement with congestion of the liver. The respiration became oppressed and laborious, and the animal died in a short space of time of asphyxia, often accompanied with convulsions. In an animal in whom only one side of the body was varnished, the cutaneous capillaries of that side were found gorged with dark-colored blood, while on the opposite side the blood was of a scarlet hue, and small in quantity. In the majority of the animals examined after death the veins near the heart were found distended with black soft coagula, and in some there were ecchymoses in the lungs. Fourcault found that animals deprived of their skin survived longer than those covered with varnish; and reminds us of the poor child, intended to represent the golden age at the election of Pope Leo the Tenth, who, being covered with gilding, soon after died from the effects of the process. Becquerel and Breschet

[1] Gazette Médicale, April 27, 1844.

[2] Examinateur Médicale, Oct. 1841.

repeating the experiments of Fourcault in reference to animal temperature, conceived that if they could prevent transpiration by the skin, they would induce internal fever; the contrary, however, was the fact. After the application of a thick layer of varnish upon the skin of a rabbit, and adjusting their thermo-electric needles, they found the temperature of the deep muscles, in the course of half an hour, reduced from 100° to 89°; in another half-hour to 76°; and in a third half-hour it stood at only 3° above the temperature of the atmosphere, 63°; so that, in the course of an hour and a half the temperature of the animal had fallen 34°, and the creature died. Fourcault also produced albuminuria in dogs by a similar expedient; the first change perceptible in the urine was a diminution of its acid reaction; then albumen became apparent, and at the same time the urine was alkaline. He conceives that the detention of the lactic acid salts in the blood destroys the equilibrium of organic affinities, and leads to the elimination of the albuminous element of the blood.

The chemical constituents of perspiration are, water, nitrogen, animal extract, fat; carbonic acid with its salts, carbonates of soda and lime; lactic acid with its compound, lactate of ammonia; acetic acid, acetate of soda, butyric acid, chloride of sodium, hydrochlorate of ammonia, phosphate of soda and lime, sulphate of soda, salts of potash, and peroxide of iron. Anselmino gives the following analysis[1] of the dried residue of the perspiratory secretion:

Matters insoluble in water and alcohol, chiefly calcareous salts,	2
Animal matter soluble in water, insoluble in alcohol, regarded by Anselmino as salivary matter (?), and sulphates,	21
Matters soluble in dilute alcohol; chloride of sodium and osmazome,	48
Matter soluble in alcohol, osmazome, and lactates,	29
	100

Simon collected the perspiratory fluid from the arms and face, and found it to be a turbid, dirty-looking fluid, which deposited gray floccules on standing. By the microscope these floccules were ascertained to be epidermal cells. The specific gravity of the fluid was in one instance 1003, and in another 1004. It was slightly acid at first, but became neutral on standing for twenty-four hours; and a rod moistened with hydrochloric acid, held over it at this period, detected the vapor of ammonia. The results of the investigations of Simon establish the existence in the normal perspiratory secretion of—

"Substances soluble in ether: traces of fat, sometimes including butyric acid.

"Substances soluble in alcohol: alcoholic extract, free lactic or acetic acid, chloride of sodium, lactates and acetates of potash and soda, lactate or hydrochlorate of ammonia.

"Substances soluble in water: watery extract, phosphate of lime, and occasionally an alkaline sulphate.

"Substances insoluble in water: desquamated epithelium and (after the removal of the free lactic acid by alcohol) phosphate of lime, with a little peroxide of iron."[2]

[1] Müller's Physiology, Translation, page 579.

[2] Animal Chemistry with reference to the Physiology and Pathology of Man. By Dr. J.

Dr. Landerer found urea in healthy perspiration in addition to phosphates, sulphates, acetates, lactates, chloride of sodium, and osmazome.[1]

Dr. P. A. Favre sums up his researches on the chemical composition of the perspiration as follows: Its solid components, with the exception of a trace, are soluble in water; its predominant salt is chloride of sodium; alkaline sulphates exist in it in very small quantity; alkaline and earthy phosphates are barely discoverable; lactic acid is present in the form of lactates; it possesses a peculiar nitrogenous acid, *sudoric acid*, resembling uric acid in its chemical nature; the new acid is combined with alkalies, but uric acid never occurs; urea is present; there is but little oily or albuminous matter; the latter is in combination with the alkalies; the potash is chiefly combined with the organic acids, the soda with the mineral acids; the composition of the perspiration obtained under similar circumstances, but at different periods, is generally similar; the organic salts exceed the mineral salts at the beginning of perspiration, and *vice versâ;* the proportion of water to the solid constituents remains the same during the entire continuance of forced perspiration.[2]

Our information with regard to morbid perspiration is very limited and unsatisfactory. Simon made the analysis of this secretion, obtained from a man who had been the subject of psoriasis vulgaris for seventeen years; but his results are inconclusive, from the fluid being in a state of decomposition. Its specific gravity was 1008; it smelt strongly of hydrosulphate of ammonia, and gave off, when evaporated, a penetrating odor of sulphuretted hydrogen, which ultimately merged into a nauseous animal smell. "It yielded 9.9 of solid constituents, which, after being exposed to the influence of a red heat, were found to consist of a large proportion of chloride of sodium, carbonate of soda, a little phosphate of lime, and a fair amount of sulphuric acid." The perspiration of "persons with the itch is said to have a mouldy odor." And "according to Stark, the quantity of free lactic acid is increased" in certain cutaneous affections.

The gases of the perspiratory secretion—namely, carbonic acid and nitrogen—are exhaled in largest quantity after meals or violent exertion, the former being most abundant where the food has been vegetable, and the latter where the food has been animal.[3] The quantity of water excreted by the skin bears reference to the circumstances above detailed—namely, the comparative activity of the exhaling organs, the condition of the atmosphere, and the state of the system. The nitrogen, according to Liebig, originates chiefly in the decomposition of the atmospheric air carried into the stomach with the saliva, or absorbed from the exterior by means of the skin. During digestion, the oxygen of the atmospheric air enters into combina-

Franz Simon. Translated and edited by Dr. George E. Day, for the Sydenham Society, vol. ii. p. 103.

[1] Heller's Archiv., vol. iv. p. 196.

[2] Archives Générales de Médecine, vol. ii. 1853.

[3] Collard de Martigny, in Magendie's Journal, vol. x. p. 162.

tion with the food, and the nitrogen is set free to make its way by endosmosis through the stomach and diaphragm into the lungs, or through the parietes of the body to the skin. It follows, therefore, that the quantity of nitrogen set feee in the stomach, and, consequently, the quantity exhaled by the skin, is proportioned to the duration of digestion. Thus, in certain herbivorous animals in whom the process of digestion occupies a long period, and is increased by rumination, a large quantity of atmospheric air is conveyed into the stomach, and a larger proportion of nitrogen is extricated from the skin, than in carnivora. The same circumstance must take place when any cause exists which retards digestion. The quantity of carbon also bears reference to the nature of the ingesta: where a large quantity of carbonic acid is generated in the stomach, the gas makes its way directly to the lungs, as did the nitrogen, or to the skin. Dr. Dalton estimates the proportion of carbon eliminated by the skin, irrespective of variety in food, at one-twentieth of the entire quantity of perspiratory secretion. To the animal matters, the ammonia, the acetic acid, and the lactic acid, are to be ascribed the powerful odor of the perspiratory fluid, while its acid reaction is determined by the latter.

CHAPTER II.

CLASSIFICATION OF DISEASES OF THE SKIN.

A GOOD CLASSIFICATION of diseases of the skin is one of the first wants of the student of dermatology, as it is amongst the first labors which have engaged the attention of the professors of this branch of medicine from the earliest to the present times. The classification which has heretofore served as the framework of the present treatise, and to which, fifteen years back, I gave the title of "natural system," was founded on the physiology and pathology of the skin, and took as its leading characters the phenomena of inflammation of the derma—namely, congestion, effusion, suppuration, desquamation, &c. This classification accords in all essential particulars with the arrangement of Willan, which is the one pretty universally adopted throughout the world at the present day. The claims of the Willanean system to general favor are its simplicity and convenience; but like the artificial system of classification of Linnæus, as applied to the animal and vegetable kingdoms, to which the same merit is due, it is open to many and serious objections; it conveys no idea of the nature and cause of the various forms of disease, and, consequently, affords no aid to the comprehension of their treatment.

The artificial system of classification of diseases of the skin, or, as it may be termed, the Teutonic-English system, from its origin with

Plenck[1] and subsequent amplification and improvement by Willan, is attractive to the student and superficial observer, from its easy applicability to the discovery of the *name* of a given disease; but this discovery only too frequently results in the "vox et preterea nihil." The tongue that glibly utters the name has no words to tell the cause or suggest the treatment; and the practical physician is naturally offended with a system which is all for the eye and nothing for the judgment, which embarrasses rather than helps him to the comprehension of a correct "methodus medendi." In the consulting-room or by the bedside of the patient, he yearns for that fuller knowledge of the disease, which will enable him to satisfy both his conscience and his self-respect, by guiding him to a correct and successful principle of treatment. This object is clearly not to be attained by the artificial system; and therefore, with many others who have similarly felt, I have long turned my mind to the construction of a classification of a more practical and, I may add, more philosophical kind, embracing the conveniences of the artificial system, with the medical fitness of a more practical system.

An etiological system of classification was initiated by Hippocrates, when he divided diseases of the skin into *local* and *constitutional;* and Hippocrates has been followed in his endeavors by Lorry, Derien, Joseph Franck, Plumbe, and more recently by Baumès.[2]

Without venturing to comment on the theories which have served as the basis of the classifications proposed by these authors, I will proceed to develop the etiological system which has resulted from my own researches into the nature of these diseases, and which, I trust, may, as an ultimate result, render the treatment of diseases of the skin more simple and rational, and remove them from the special and isolated position which they at present occupy into the general category of diseases of the human frame. Physicians, no doubt, may still be found, who, from taste or superior ability, will pursue, and become eminent in, the treatment of these diseases, as a special department; but there will no longer be a reason for the neglect of their study in the general education of the physician, nor need their very existence be so completely ignored, as is at present the case in our general hospitals and medical schools.

The great family of diseases of the skin admits of division into two primary groups; namely—

I. Diseases affecting the general structure; and
II. Diseases affecting the special structure of the skin.

The diseases affecting the general structure of the skin, or derma proper, are such as implicate at once all the tissues which enter into its composition.

The diseases affecting the special structure of the skin are those

[1] Doctrina de morbis cutaneis. Vienna. 1776.

[2] Nouvelle Dermatologie ou precis theorique et pratique sur les maladies de la peau fondé sur une nouvelle classification médicale, &c., par P. Baumès' Chirurgeon en chef de l'hospice de l'Antiquaille de Lyon, &c., 1842.

which select its separate components, such as the vessels, nerves, papillæ, and pigment; or its special organs—namely, the sudoriparous glands, sebiparous glands, hair-follicles and hairs, and nail-follicles and nails.

The diseases affecting the general structure of the skin are divisible into five groups as follows: namely—

I. Diseases affecting the General Structure.

1. Diseases arising from general causes.
2. Diseases arising from special external causes.
3. Diseases arising from special internal causes.
4. Diseases arising from the syphilitic poison.
5. Diseases arising from animal poisons of unknown origin, and giving rise to eruptive fevers.

The diseases affecting the special structures of the skin are divisible into eight groups, as follows: namely—

II. Diseases affecting the Special Structure.

1. Diseases of the vascular structure.
2. " nervous structure.
3. " papillary structure.
4. " pigmentary structure.
5. " sudoriparous organs.
6. " sebiparous organs.
7. " hair-follicles and hair.
8. " nail-follicles and nails.

I. DISEASES AFFECTING THE GENERAL STRUCTURE OF THE SKIN.

Returning now to the first of the primary divisions—namely, "Diseases affecting the general structure of the skin"—and taking its first group, "Diseases arising from general causes," I have grouped under this head seven *typical forms* of disease, five of which correspond with as many orders of the Willanean classification,—namely, Exanthemata, Papulæ, Vesiculæ, Pustulæ, and Bullæ.

The term *general*, as applied to the causes giving rise to the diseases assembled together in this group, is simply intended to convey a signification the opposite of *special*, and to suggest the idea of a cause originating in the mal-performance of the ordinary functions of animal life, rather than to include a variety of causes. Indeed, in my opinion, the whole of the diseases grouped under this head proceed from one primary and essential cause, namely, *mal-assimilation;* in other words, from an irritant poison generated in the organism of the individual as a consequence of mal-assimilation, the morbid action in the cutaneous tissues being a vital process having for its object the elimination of that poison by the skin.[1] Arising, then, from one and the same pri-

[1] It is interesting to glance at the theory of cutaneous disease held by the renowned physician Riolanus, who flourished three centuries back: "Sed cur cutis, tot adeoque;

mary cause, the variety which is presented in the form and condition of the apparent disease, is simply the result of certain phenomena which are known to modify and alter the character of disease when it attacks other organs of the body—the result, in fact, of predisposing causes, either congenital or acquired. The divisions belonging to this group are as follows:

1. Diseases arising from General Causes.

a. Erythema, (exanthemata.)
Pityriasis.
Erysipelas.
Roseola.
Urticaria.

b. Lichen, (papulæ.)
Rosacea.
Strophulus.
Prurigo.

c. Eczema, (vesiculæ.)
Psoriasis.
Sudamina.

d. Impetigo, (pustulæ.)
Ecthyma.

e. Herpes, (bullæ.)
Pemphigus.

f. Furunculus, (tubercula.)
Anthrax.

g. Purpura.

In the reading of this table Erythema is taken as the type of a group of diseases, of which erysipelas, roseola, urticaria, and pityriasis are modified forms—pityriasis being, in fact, simply a chronic erythema. In like manner, rosacea, strophulus, and prurigo are varieties of the type Lichen; and psoriasis and sudamina of the type Eczema. I shall explain fully in its proper place my reasons for regarding psoriasis as a form of eczema, in fact as a chronic eczema, and taking it from a position which it certainly has no right to occupy, namely, by the side of Lepra. In an etiological classification, as compared with the dermatographic classification or classification of forms, at present in use, this change becomes necessary, and will, I believe, be attended with no inconvenience.

2. Diseases arising from Special External Causes.

The external causes which tend to irritate the skin and give rise to disease are few in number, being limited to the presence of *parasitic animals* on, in, or under the skin; and to the destructive agency of *heat* and *cold*. Of the class of "diseases affecting the general structure of the skin," it is in this group alone that we meet with affections of the cutaneous tissue independent of constitutional origin—in other words, pure diseases of the skin; those of the other groups being essentially *blood-diseases*, and depending for their existence on a morbid condition of the vital fluid. The representatives of the present division are—

Scabies,
Malis,
Ambustio,
Gelatio.

differentes affectus patitur tam sæpe ut vix ulla audiatur tam frequens querimonia? quia est emissarium commune et sub ea colligitur tertiæ coctionis superfluitas omnis: nisi fuliginosa excrementa per cutis spiracula liberè expurgentur, si stegnosis conniventia, densitas, astrictio vel obstructio pororum cutis difflationem impediat quæ sub cute subsistent excrementa, occasionem dabunt morbis cutaneis." (Johannis Riolani Ambiani medici Parisiensis viri clarisimi opera omnia, 1610, p. 548.)

3. Diseases arising from Special Internal Causes.

This is an important group, heretofore intermingled with the general diseases of the skin, from which, in truth, they are totally distinct. In the Willanean classification, they are associated with other diseases of the general type in the two orders *Squamæ* and *Tubercula;* by which means their natural affinities are destroyed, and the opportunity is lost of considering their relations to each other, and comparing their mutual characters. The diseases constituting this group are,—

Lepra,	(squamæ,	Willan).
Lupus,	(tubercula,	Willan).
Scrofuloderma,	"	"
Kelis,	"	"
Elephantiasis,	"	"

4. Diseases arising from the Syphilitic Poison.

In the preceding group the cause is unknown or merely hypothetical; in this, on the contrary, the cause—namely, the syphilitic poison—is well known and universally recognized. The laws and phenomena of the syphilitic poison have been made the subject of careful investigation, and the facts established by the observation of this poison become a guide to the comprehension of the action of poisons less known or only suspected, such as in all probability are the hidden cause of the diseases assembled in the foregoing group. The forms in which syphilis appears in the skin (syphilo-dermata) may be classed as follows:

a. Erythema,
Roseola.

b. Lichen,
Lichen pustulosus.

c. Tubercula.
Tubercula ulcerantia.

d. Rupia.

e. Alopecia.

f. Onychia.

5. Diseases arising from Animal Poisons of unknown Origin, and giving rise to Eruptive Fevers.

The eruptive fevers originating in special animal poisons—poisons of which the phenomena and laws are known, but whose source is hidden from our knowledge—naturally form a group by themselves. These poisons are three in number, rubeolous, scarlatinous, and variolous, and the diseases proceeding from them as follows:

Rubeola,
Scarlatina,

Variola,
Varicella,
Vaccinia.

II. DISEASES AFFECTING THE SPECIAL STRUCTURE OF THE SKIN.

The special structure of the skin being its vessels and nerves, the sources of its nutrition and innervation; its papillæ, which determine the character of its surface; the pigmentary principle, which gives color to the investing cuticle; together with its glands, hair, and

nails;—these become so many heads, under which the morbid affections of its particular organs may be considered. Many of the affections of these special organs are simply local—in fact, pure diseases of the skin, and removed from the influence of the constitutional powers, and from the more important category of blood-diseases, which compose the first great division of cutaneous affections; but some among them take their source in constitutional disturbance. The number of the latter, however, is not sufficient to render the application of the etiological method of classification to this division a matter of advantage. I have therefore adhered, as respects them, to the physiological system previously in use.

In the instance of the vascular structure, the only derangements which call for separate consideration are those resulting from simple enlargement of the cutaneous vessels, especially the veins; and, abnormal increase of the capillary vessels, giving rise to vascular nævi. In the nervous structure the deviations from the standard of health are three in number, as indicated by excess of sensibility, or hyperæsthesia; diminished sensibility, or anæsthesia; and altered sensibility, or pruritus. These two groups admit of arrangement as follows:

1. Diseases affecting the Vascular Structure of the Skin.

Hypertrophia venarum, Nævi vasculosi.

2. Diseases affecting the Nervous Structure of the Skin.

Hyperæsthesia, Anæsthesia, Pruritus.

3. Diseases affecting the Papillary Structure of the Skin.

The diseases in which the papillæ of the skin are chiefly concerned are such as result from the enlarged growth or hypertrophy of those organs; they are represented by the wart, the corn, and by callosity and thickening of the cuticle; and may be grouped as follows:

Verruca, Tylosis,
Clavus, Pachulosis.

4. Diseases affecting the Pigmentary Structure.

Disordered conditions of the pigment of the skin resolve themselves into two degrees of development of the pigment as respects quantity, and one in which the quality of the pigment is altered. To these I have added that change in the color of the skin which is occasioned by the internal use of the salts of silver, not from any title it may be supposed to possess to consideration in this place, but simply for convenience. It thus forms a fourth head under the name of "Chemical Coloration of the skin."

a. Augmentation of pigment.

Melanopathia,
Spilus,
Nævi pigmentosi.

b. Diminution of pigment.

Alphosis,
Leucopathia.

c. Alteration of pigment.

Ephelis, Chloasma,
Lentigo, Melasma.

d. Chemical coloration.

Decoloratio argentea.

5. DISEASES AFFECTING THE SUDORIPAROUS ORGANS.

The disorders of perspiration are, like those of the pigmentary product, reducible to three, namely, excess, defect, and altered quality; as follows:

a. Augmentation of secretion.

Idrosis.

b. Diminution of secretion.

Anidrosis.

c. Alteration of secretion.

Osmidrosis,
Chromidrosis,
Hæmidrosis.

6. DISEASES OF THE SEBIPAROUS ORGANS.

The disorders of the sebiparous organs are somewhat more complicated and numerous than those of the sudoriparous glands, as may be inferred from their greater size and more extensive function. They are not alone referable to the three states of excess, defect, and alteration of secretion; but also involve the phenomena of impeded excretion and inflammation of the gland extending to surrounding tissues. They may be grouped as follows:

a. Augmentation of secretion.

Stearrhœa simplex.

b. Diminution of secretion.

Xeroderma.

c. Alteration of secretion.

Stearrhœa flavescens,
Stearrhœa nigricans,
Ichthyosis sebacea.

d. Retention of secretion.

(Duct open.)	(Duct closed.)
Comedones,	Tubercula miliaria,
Accumulationes sebaceæ,	Tumores serosi,
Cornua.	Tumores sebacei.

e. Inflammation of gland and adjacent textures.

Acne.

7. DISEASES OF THE HAIR AND HAIR-FOLLICLES.

The abnormal and morbid conditions of the hairs and hair-follicles are numerous, being partly referable to modifications in quantity, direction, and color of the hair, and partly to disease involving chiefly

the hairs themselves or the follicles in which they are produced. The following arrangement will embrace the whole of these operations:

a. Augmented formation.
Hirsuties,
Nævi pilosi.

b. Diminished formation.
Defluvium capillorum,
Alopecia,
Calvities.

c. Abnormal direction.
Trichiasis ciliorum,
Trichiasis coacta.

d. Alteration of color.
Trichosis decolor,
Trichosis cana.

e. Diseases of Hairs.
Trichosis furfuracea,
Trichosis plica.

f. Diseases of Hair-Follicles.
Stearrhœa folliculorum,
Erythema folliculorum,
Inflammatio folliculorum,
Sycosis,
Favus.

8. Diseases of the Nails and Nail-Follicles.

The disorders of the nails and nail-follicles are referable to alterations in the growth and texture of the nails, both of which states may be included under the term "degeneration;" and inflammation followed by suppuration of the matrix of the nail or onychia; thus,

Degeneratio unguium,
Onychia.

In a tabular form, this classification will stand as follows:

I. Diseases affecting the General Structure of the Skin.

1. Diseases arising from General Causes.	*a.* Erythema,	(Exanthemata, Willan)
	Erysipelas,	
	Roseola,	
	Urticaria.	
	b. Lichen,	(Papulæ, Willan)
	Strophulus,	
	Prurigo.	
	c. Eczema,	(Vesiculæ, Willan)
	Sudamina.	
	d. Impetigo,	(Pustulæ, Willan)
	Ecthyma.	
	e. Herpes,	(Bullæ, Willan)
	Pemphigus.	
	f. Furunculus,	(Tubercula, Willan)
	Anthrax.	
	g. Purpura.	
2. Diseases arising from Special External Causes.	Scabies,	
	Malis,	
	Ambustio,	
	Gelatio.	
3. Diseases arising from Special Internal Causes.	Lepra,	(Squamæ, Willan)
	Lupus,	(Tubercula, Willan)
	Scrofuloderma,	
	Kelis,	
	Elephantiasis.	

4. Diseases arising from the Syphilitic Poison.	*a.* Erythema, Roseola. *b.* Lichen, Lichen pustulosus. *c.* Tubercula, Tubercula ulcerantia. *d.* Rupia. *e.* Alopecia. *f.* Onychia.
5. Diseases arising from Animal Poisons of unknown origin, and giving rise to Eruptive Fevers.	Rubeola, Scarlatina, Variola, Varicella, Vaccinia.

II. Diseases affecting the Special Structure of the Skin.

1. Vascular structure.	Hypertrophia venarum, Nævi vasculosi.
2. Nervous structure.	Hyperæsthesia, Anæsthesia, Pruritus.
3. Papillary structure.	Verruca; Clavus; Tylosis; Pachulosis.
4. Pigmentary structure.	*a.* Melanopathia, Spilus, Nævi pigmentosi. *b.* Alphosis, Leucopathia. *c.* Ephelis; Lentigo; Chloasma; Melasma. *d.* Decoloratio argentea.
5. Sudoriparous organs.	Idrosis; Anidrosis; Osmidrosis; Chromidrosis; Hæmidrosis.
6. Sebiparous organs.	*a.* Stearrhœa simplex. *b.* Xeroderma. *c.* Stearrhœa flavescens, Stearrhœa nigricans, Ichthyosis sebacea. *d.* Comedones, Accumulationes sebaceæ, Cornua, Tubercula miliaria, Tumores serosi, Tumores sebacei. *e.* Acne.

7. Hair-follicles and Hair.	*a.* Hirsuties; Nævi pilosi. *b.* Defluvium capillorum, Alopecia; Calvities. *c.* Trichiasis ciliorum, Trichiasis coacta. *d.* Trichosis decolor, Trichosis cana. *e.* Trichosis furfuracea, Trichosis plica. *f.* Stearrhœa folliculorum, Erythema folliculorum, Inflammatio folliculorum, Sycosis; Favus.
8. Nail-follicles and Nails.	Degeneratio unguium; Onychia.

CHAPTER III.

GENERAL PATHOLOGY OF THE SKIN.

REGARDING the skin with the view of understanding and arranging its pathological phenomena, we find it to present, in the first place, a general superficies; secondly, a glandular apparatus; thirdly, a covering of hairs; fourthly, an epidermal investment, including the nails, and a pigmentary structure; and fifthly, vessels and nerves. The superficies is the most extensive of these parts, and that especially in which the first great division of cutaneous diseases, namely, *diseases affecting the general structure of the skin*, is developed; it will therefore be necessary to define exactly what should be comprehended under this term.

By *general superficies* is to be understood not only the apparent surface of the skin, but also that portion of the surface which forms the vascular walls of the follicles and excretory ducts of glands. The depth to which this latter portion extends is variable, but may be supposed to cease before reaching the actual structure of the glands. Thus, although appertaining anatomically to the glandular apparatus of the skin, the superficial portion of the follicles and of the glands, together with their outlets the pores, belongs, in a pathological point of view, to the superficies.

In considering the pathological phenomena of inflammation of the superficies, we find ERYTHEMA, or simple vascular congestion; LICHEN, or congestion of the pores and superficial portion of the follicles, producing a tumid state of those parts, and constituting *pimples;* ECZEMA, a vascular congestion, accompanied by effusion of liquor sanguinis, lymph, or serum, and giving rise to *vesicles;* IMPETIGO, a similar pathological condition, resulting in the production of pus and *pustules;* and FURUNCULUS, vascular congestion, with loss of vitality of a part

of the structure of the skin. The first four of these pathological states are, as we have already seen, the basis of the dermatographic, or Teutonic-English classification. They are the exanthemata, papulæ, vesiculæ, and pustulæ of Plenck and Willan; and the congestive, depositive, effusive, and suppurative inflammation of my own early classification.

Now, as simple inflammation is capable of, and is the active agent in, producing these several morbid conditions of the skin, we are not surprised at finding that they are mutually convertible; that an erythema, for example, may become a lichen by the development of pimples, an eczema by the evolution of vesicles, or an impetigo by the production of pustules. In the same manner, the pimples of lichen having subsided, the lymph or ichor of eczema being dried up, and the pus of impetigo exfoliated in crusts, there may remain behind a chronic erythema, to which another term, *psoriasis*, has been applied.

Therefore, in essential nature, erythema, lichen, eczema, impetigo, and psoriasis, are simply modified manifestations of inflammation of the skin, corresponding with recognized stages of common inflammation; the modifications resulting from intensity, cause, and idiosyncrasy, in other words, from accidental conditions. Let me illustrate this position by reference to a common and well-known inflammation of the skin, *scabies*, occasioned by a known cause, namely, a local irritant, the acarus scabiei. If we imagine an entire family affected with this complaint, what shall we find in its various members? In the father, with a sturdy constitution and firm skin, hardened by labor, we shall probably find erythema and lichen; in the mother, with a woman's idiosyncrasy, we have erythema, lichen, and eczema; in her little girl, a delicate child, erythema, lichen, eczema, and impetigo, and so on for the rest. I have verified this observation many times over. It is one beyond dispute or doubt, and must necessarily lead to the conclusion, that although, in their fully developed state, erythema, lichen, eczema, impetigo, and psoriasis, are strikingly dissimilar, yet in their pathological nature they may be and are essentially the same.

Let me take another line of argument. A medical man is called to a case of inflammation of the skin; he recognizes an erythema; he visits his patient the next day, it has become an eczema; he at once regards the erythema of the day before in its true light, namely, as a stage of inflammation. Instead of an eczema the second day, he might have found a lichen or an impetigo. But supposing, as is often the case, that the pimples of lichen have subsided, probably been lost in the general thickening of the inflamed portion of skin, that all trace of vesicles and pustules is gone, but that a chronic state of inflammation, accompanied by its usual signs, redness, thickening, exfoliation of cuticle, perhaps chapping, continues—what is the case now? obviously chronic erythema, or psoriasis. Therefore, I repeat, an erythema may be, according to the period at which it is viewed, or in obedience to accidental circumstances, an erythema, a lichen, an eczema, an impetigo, or a psoriasis.

In endeavoring to show the analogy subsisting between the morbid affections of the skin and the common source of those I have already enumerated, it must not be supposed that I undervalue the distinctions which at present exist between them. I should be a little inclined to dispute the propriety of the terms, helix, antihelix, tragus, antitragus, &c., applied to parts of the external ear; but I can only regard them in the same light, namely, as serving to facilitate description, to enable us to fix with certainty the point of discussion, to assist diagnosis and prognosis, and in an equal degree to determine a principle of treatment. But it would be difficult, with the above explanation before us, to consider them as essentially different diseases, and more so as separate orders, or genera, or even species of disease; the utmost rank they can aspire to, is that of varieties of manifestation.

The light in which I have hitherto placed the typical forms of inflammation of the superficies of the skin, is the one most favorable to their consideration as separate diseases. I have now to remark, that they are seldom found perfectly distinct; for example, erythema is generally present in combination with the others; and furthermore, the united presence of lichen and eczema, of lichen and impetigo, of eczema and impetigo, is among the commonest phenomena of cutaneous disease. Indeed, so frequent are these unions, that they have been thought worthy of celebration by special names; for example, eczema impetiginodes, impetigo eczematoso, &c.; so that, not only are the forms of erythema, lichen, eczema, impetigo, and psoriasis convertible into each other, but they are also very frequently found in conjunction. How, then, any longer, can we admit them to be separate orders or genera of disease?

But this is not all the illustration of which the subject admits. In the same attack of eruption, the form of disease is different in different regions of the body, a difference resulting from the particular organization of the part. For example, on the scalp true papulæ are never seen, and vesicles very rarely. On the hands, and especially the fingers, vesicles and pustules are frequent; but on the rest of the surface of the body lichen is the common type. So that, in a general eruption occurring upon the entire body, the diagnosis would be erythema in one part, lichen in another, eczema in a third, possibly impetigo in a fourth, and psoriasis in a fifth. Now, if we conceive a disciple of the schools brought in presence of a patient so affected, he would gravely inform us that he saw five different and distinct complaints belonging to five different orders of disease, and possibly, to complete the absurdity, he might think it necessary to prescribe five different modes of treatment: whereas, in a practical point of view, there is but one disease, an inflammatory eruption, exhibiting on various parts of the body the five usual modes of manifestation of cutaneous inflammation, and all amenable to the same treatment.

The term ERYTHEMA (ἐρύθημα, rubor) is well chosen to express inflammatory redness of the skin without pimples, vesicles, or pustules. The redness is more or less uniform, and is produced by simple congestion of the cutaneous vessels. The inflamed part is but slightly swollen, excepting where effusion of serum into the tissues of the skin

has taken place, constituting œdema. It may be acute or chronic. The former terminates by subsidence of the redness and exfoliation of the cuticle; the latter, from long continuance, produces deeper changes—the skin becomes thickened and hard, cracks in the direction of the lines of motion, constituting chaps or rhagades, and throws off a copious furfuraceous desquamation. It is to the latter state of chronic erythema that the term *psoriasis* is properly applied.

The term LICHEN (λειχὴν, summæ cutis asperitas) is applied to that form of roughness of the skin, which results from the development of pimples (papulæ). The pimples of lichen, in their pathological nature, are a state of congestion and thickening of the walls of the excretory ducts of the skin; both the congestion and thickening tending to raise the pores above the level of the general surface, and constitute pimples. In its simplest form, where there is not much congestion of vessels, lichen is not to be distinguished from the cutis anserina, produced by muscular contraction of the skin, and desertion of the capillaries by its blood. In its more congested form, the papules are redder and larger than those of cutis anserina. The papules of lichen are never found upon the scalp, the palms of the hands, or soles of the feet; in the former situation, probably because the pores are large, more firmly retained in place from their relation to the hairs, and the skin between the pores more susceptible of the congestive action. In the latter, they do not occur, in consequence of the thickness of the cuticle. The papules of lichen vary in size in different regions of the body, and at different periods of life; they are small and hard on the trunk and limbs, in the adult; large and soft on the face; and also large and soft in infants, in whom they are termed *strophulus*. When a lichenous papule is examined with a lens, its summit is found to be whitish and transparent—an appearance which results from the cone of transparent cuticle which occupies the mouth of the dermal follicle. This appearance has been mistaken for fluid, and the summits of such pimples have been described as vesicles containing serum. The true vesicle requires no such nice observation; it is a fair blister, of small size it is true, but never so small as to require the aid of a lens for its discernment.

Lichen terminates, like erythema, in subsidence and cuticular exfoliation; the latter action being kept up for a considerable time when the eruption is chronic.

Such are the characters of simple lichen; but a more severe form exists, to which the term *lichen agrius* (ἄγριος, fierce) has been given. In lichen simplex, the papules are isolated, and unattended with much erythema; but in lichen agrius, the papules are congregated so as to form a cluster of greater or less extent; the heat and itching are intense; the erythema excessive; and there is, moreover, an oozing of an ichorous fluid from the surface, the ichorous secretion being abundant when the inflamed surface is rubbed or scratched. In almost every smart attack of lichen, patches of lichen agrius occur; or they may be found separately, and independent of a general eruption of lichen. Here, then, we have imported into lichen, essentially

an eruption of dry pimples, a new element, namely, an ichorous exudation; in other words, the eczematous element; and lichen agrius, with a more definite nomenclature, becomes *lichen ichorosus*, or *lichen eczematosus*. Sometimes the ichorous secretion becomes purulent, and small pustules are developed around the inflamed patch; in which case the term *lichen impetiginodes* might not be inaptly applied. Then, after a time, the inflammation subsides, the ichorous exudation is no longer produced, but the affected skin remains thickened, is uneven, from the presence of numerous cracks and fissures, and coated with thin cuticular scales, which are constantly thrown off by exfoliation, to give place to a new succession of similar scales. The case is now one of *psoriasis;* the papules have long since subsided and ceased to be apparent, and the pathological aspect is that of a circumscribed erythema with thickening of the skin, more or less fissured with cracks and chaps, and coated with little flakes or scales of dried cuticle, —a chronic erythema, in fact, which in cutaneous pathology is known by the name of psoriasis.

Eczema (ἐκζέω; *ex ferveo*, to boil out, or seethe) is the term applied to the development of small vesicles on the skin, in combination with more or less of erythema. The term does not mean simply to compare the small vesicles with the bubbles of a seething or boiling fluid, but also to take into consideration the heat accompanying that process: "Eas ἐκζέματα, ab *ebulliente fervore*, Græci vulgo appellant," says Ætius. Now, in essential nature, eczema is the same as lichen, accompanied like lichen with more or less of erythema, the vascular congestion, as in lichen, being most intense in the walls of the excretory ducts of the skin, and the vesicles being formed chiefly at their outlets or pores. The difference between eczema and lichen is not one of cause, but of manifestation—the difference of manifestation being chiefly due to difference of temperament and sex. Eczema is more common in females than in males, in the sanguine and lymphatic than in the choleric and nervous temperaments. Eczema, moreover, is never present without lichen, and only becomes eczema when the vesicles are in excess over the papules. Eczema may also have a mingling of the pustules of impetigo, or the ichorous contents of its vesicles may become purulent; in either case it ceases to be simple eczema, and is then eczema impetiginodes.

The phenomena which I have pointed out as subsisting in lichen, and determining the transition of lichen simplex into lichen agrius, are also demonstrable in eczema. Eczema may exist as isolated vesicles, or vesicles few in number, without inflammation—*eczema simplex*. Eczema may be accompanied by much inflammation—*eczema rubrum*. The ichorous secretion of eczema may become purulent, and pustules be developed in the midst of the vesicles—*eczema impetiginodes;* and eczema may pass into a chronic stage, marked by dull redness, a thickened and chapped state of the skin, and the production of cuticular scales—into that state, in fact, which is denominated *psoriasis*.

In the consideration of lichen, I remarked that the summits of the papules have a certain transparency, occasioned by an accumulation

of epidermis, a mere anatomical character; and that this transparency has suggested the idea of their containing fluid, and has led to their being punctured with a fine instrument, to determine whether such were the case. Now, the true vesicle is not a doubtful appearance; it requires no rigid examination, no exploration by the needle or the lens; it is a little bladder, perfectly appreciable by the eye. It is true that it varies in form, being conical when it occurs singly on the summit of a papule, as in scabies, and semispheroidal where the effusive action is more general. At first it involves the periphery of a pore; by degrees vesicles are formed on the derma between the pores, and it is no uncommon thing to see the cuticle raised up to some extent, as, for example, completely around a finger, or for the space of an inch or more of the surface of the skin. The vesicle is no longer unilocular; it has become multilocular. If the inflammation subside, the effused fluid may become absorbed or evaporated, and the raised, and consequently dead cuticle, thrown off by desquamation. Should the inflammation be kept up, and the quantity of effused fluid increase, the softened cuticle will burst, and come away in flakes, leaving behind it the inflamed and uncovered derma, moistened by a colorless lymph or ichor, which is poured out in considerable quantity. In this latter state the separate vesicles are lost, as are the papules in lichen agrius, and the diagnosis must rest on the excoriation of surface and the abundant effusion of ichorous fluid—in fact, upon characters which equally belong to lichen agrius.

Impetigo, derived, according to Pliny, *ab impetu*, a bursting forth with violence, conveys nothing in its name of the signification which we are in the habit of attaching to it, namely, a pustular eruption. It is an inflammation of the skin, attacking primarily, like lichen and eczema, the mouths of the follicles, and giving rise to an effusion of pus, in place of the ichor or lymph of eczema. The pustules are small, sometimes not bigger than the vesicles of eczema; at other times, and especially on the scalp, larger, and sometimes, by confluence, spreading over a considerable surface.

Impetigo is a rarer affection than eczema, and in its pathological nature differs from eczema rather in the pyogenic tendency of the constitution than in any more essential character. It is, in fact, a pustular eczema, just as eczema is an ichorous lichen, and the latter a papulous erythema. Impetigo presents, also, another character, which is common to it with lichen and eczema; it has its "fierce" form, in which there is great redness, some tumefaction of the skin, but especially the secretion of an abundance of colorless lymph, which is often poured forth in such quantities as to saturate all the coverings applied to it. In this state, and taking the ichorous secretion as the essential character of eczema, this form of the disease, this impetigo ichorosus, has been called *impetigo eczematosus*, just as the term eczema impetiginodes was suggested by the occurrence of eczema in a pyogenic habit of constitution.

Furunculus (*furere*, to rage) is a term intended to express a higher degree of inflammation of the skin than the "boiling" of eczema, or the "impetuous bursting forth" of impetigo, and carries us back to a

period when mode of development, appearance, or immediate effects, formed the basis of nomenclature. In its pathological nature, furunculus, or boil, is an inflammation of a small portion of the skin, slow in progress, but intense in operation, and resulting in the gangrene or mortification of a portion of the cutaneous tissue. The part of the skin especially attacked, and the primary seat of congestion, is the vertical portion of the superficies, that, in fact, which constitutes the wall of the excretory duct; and to this circumstance may probably be attributed the mortification of the part primarily inflamed. Congestion is necessarily accompanied by swelling, and swelling producing pressure of the follicle, impedes circulation through its vessels, and determines the mortification which follows. The gangrene of furunculus, therefore, is not a consequence of specific inflammation, but simply of the anatomical structure of the part inflamed. The mortified part is the *core* (cœur) of the boil; it is separated from the living tissue like any other mortified part, and is eventually thrown off.

The size of the boil is determined, firstly, by the nature of the cause; and secondly, by the extent of the surface inflamed; it may be a single excretory duct; it may be several excretory ducts lying adjacent to each other; or it may be the excretory apparatus of an extensive surface, giving rise to an anthrax, or carbuncle. Anthrax (ἄνθραξ, a burning coal), or carbuncle, is, therefore, an aggregation of furuncŭli, a furunculus agrius, and its severity has reference to the consequent multiplication of morbid action; it bears to furunculus the same relation that lichen agrius bears to simple lichen, or eczema impetiginodes to simple eczema.

CHAPTER IV.

GENERAL THERAPEUTICS OF THE SKIN.

Diseases of the skin present themselves to our notice in the two states, acute and chronic; at the three periods of life, infancy, manhood, and old age; in different temperaments, normal and abnormal; in persons of different idiosyncrasy and diathesis; and in different conditions of vigor or debility of the constitution. These diversities in the degree of the disease and in the power of the individual constitute so many grounds of modification both of the material and strength of the treatment which should be applied; while other sources of modification are met with in the season of the year, the locality of the disease, as upon the scalp, the palms of the hands, the face, &c., and other special conditions appertaining to this class of diseases.

The treatment of cutaneous diseases divides itself naturally into *constitutional* and *local*, and in all the degrees of acute or chronic, we shall have to consider these two parts of our treatment. These two divisions of the subject are the medical and surgical practice of the

therapeutic art, the physician and surgeon of the medical profession; so that, in the treatment of diseases of the skin, the physician and the surgeon must be blended. The two great branches of medical art are so nicely balanced in the management of these diseases, that it becomes difficult to say which is the more important; the constitutional treatment is greatly assisted by local attention; and the local treatment would be almost useless without constitutional aid. If I were required to discard either, I would retain the constitutional power, and carry cutaneous disease into the realm of the physician—in defiance of the ancient rule that gives to surgery all that can be reached by the eye and by the hand, and to medicine that which is internal and occult.[1] The etiological principle of classification naturally develops this view of the mutual importance of the two branches of the therapeutic management of cutaneous diseases; it regards these affections as issuing from an unhealthy condition of the blood, as being essentially BLOOD DISEASES, *and not local or skin diseases.* The skin disease is the mere symptom, the telltale of the disorder of the blood; and to the experienced eye, it not only tells of the existence of disturbance, but it likewise tells the cause of the disorder and how that disorder may be removed. The local disease in this sense becomes so powerful an aid to the interpretation of the general state of the constitution, that I believe it quite possible by the mere visual examination of the eruption, the rest of the patient being concealed by a screen, to declare the diathesis of the individual, and to give a general but accurate detail of his entire medical history. Cuvier determined the natural characteristics, the form, the history of an animal, from a bone; the experienced dermatologist may do as much in regard of the constitution of his patient, by the inspection of an eruption.

Cutaneous disease, however *acute*, rarely calls for depletion by loss of blood, either by the lancet or by leeches; however, there can be no objection to the removal of blood, if the general fever run high, and the severity of the constitutional disturbance seem, in the judgment of the medical man, to warrant the measure. Diseases of malassimilation are generally diseases in which the powers of the constitution are weakly, and moderate purging, with effervescent salines, which combine with their refrigerant power a diaphoretic and diuretic action, are usually all that is needed to subdue the fever of the blood.

The best remedies of this class are the mildest, namely, the salts of magnesia, soda, and potash, either separately or in combination; the compound extract of colocynth, with blue pill, ipecacuhan, squills, or guaiacum; and as effervescent salines, the liquor ammoniæ acetatis, sesquicarbonate of ammonia, citrate or tartrate of potash, spiritus ætheris nitrici, and antimony.

When the acute stage has passed, we must have recourse to tonics, bitters with the mineral acids, bitters with alkalies, with or without the ferruginous salts, as the hæmic or anæmic condition of the patient may determine. Every physician has his favorite remedies; as a

[1] Riolanus observes: "Cutanei enim morbi non minus ad medicum quàm ad chirurgum pertinent, imò frequentius de illis consulitur medicus quàm chirurgus."

workman has his favorite tools, and an artist his favorite brushes and tints, so I may be permitted to declare in favor of particular remedies: of these are gentian, in combination with nitro-muriatic acid; sulphate of quinine with sulphuric acid; sulphate of quinine with compound infusion of roses and sulphuric acid, with or without the addition of sulphate of magnesia; infusion of quassia with sulphate of magnesia and sulphuric acid; gentian or calumba with bicarbonate of potash or soda; citrate of quinine and iron; citrate of iron in effervescence; tincture of the hydrochlorate of iron with gentian and the mineral acids or with phosphoric acid; tincture of the acetate of iron with the mineral acids; liquor cinchonæ with sulphuric acid; the trisnitrate of bismuth with soda or potash, &c.

In *chronic* affections of the skin the presence and effects of mal-assimilation are more or less obvious; the complexion of the patient is muddy, yellowish, and discolored; the eye is dull; the vessels of the conjunctiva being sometimes turgid and sometimes anæmic; the tongue is broad, pale, flabby, and indented by the teeth; the mucous membrane of the mouth and fauces is relaxed; the muscles of the whole body are soft; the heart is weak, easily excited to palpitation; there is more or less dyspepsia, as indicated by acidity of stomach, flatulence, sinking before taking food, and pain or distension afterwards; often there is weight and uneasiness in the right flank from torpid colon; the bowels are sometimes relaxed, sometimes confined; the urine is sometimes loaded, but mostly pale and abundant; there is a general feeling of languor and lassitude, inaptitude for exertion, mental or physical, and depression of spirits. And yet, with these symptoms, or at least with some of these symptoms present in a greater or less degree, the patient will declare himself perfectly well in heath—a declaration which simply amounts to "I eat, drink, and sleep;" he forgets to add, But I do all imperfectly, and I have no real enjoyment of life; as a steam-engine I act when the fire is lighted and the steam up; but I am in want of new sockets, new bolts, and an abundance of oil to rub off the rust, and ease my movements.

In these symptoms we see the operation of a mal-assimilation, of a cacochymia, which must, before long, lead to the destruction of the patient unless presently arrested. In a few words, there is mal-digestion, mal-conversion, and mal-appropriation of the food taken to sustain life; and the blood recruited from this disturbed and unhealthy source becomes loaded with morbid products, in the shape of salts, coloring principle, and fluids. If we follow this impure, this contaminated blood through its course, we shall find the organs which it supplies injured in their physical state and weakened in their function. The muscular system becomes soft and feeble, the heart participates, and the foundation is laid for disease of that organ, with all its painful train of consequences. The brain and nervous system suffer in an equal degree; the brain, irrigated with mudded blood, can develop none but muddy ideas; the intellectuality of the man is deranged, his mind depressed, and a state bordering on insanity, in fact, the promptings to suicide are at hand. Dyspepsia may be a trifling affection in itself, mal-assimilation may be but a small matter when considered

apart; but when these conditions, the authors, so to speak, of cutaneous disease, are viewed in relation to their consequences, they may be ranked among the most serious of the bodily infirmities of man.

It may be argued, that the occurrence of these changes in the blood has been wisely provided for in the structure of man, by the creation of certain organs whose function is to purify the blood, to eliminate from the blood its noxious components, to act the part of emunctories. This is quite true; the lungs, the liver, the kidneys, the bowels, the skin, are all emunctories, and all sufficient for the purposes of health, but insufficient, as is well known, for the necessities of disease. Indeed, even for the offices of health, it is an essential condition that these organs should themselves be healthy; but as they, like the muscular system and brain, are irrigated with impure blood, they also, like those organs, lose their vigor and their power of performance of their proper functions, and finally fall into a state of disease. Hence, when need is greatest relief is weakest; the source of help is enfeebled, and possibly may fail completely. It does not follow that all the emunctory organs should give way at the same moment; they become exhausted by degrees, and yield up their powers in succession. For a while the liver performs its office actively, and keeps off the pressure from the other emunctories; perchance the kidneys, in addition to their own, do part of the work of the rest; or may be, the mucous membrane of the small intestine takes on the duty of a safety-valve, and by an inordinate secretion from its surface, constituting a permanent diarrhœa, maintains the equilibrium, not of health, certainly, but of a state of existence which often passes for such—a spurious currency.

Now, let us consider the state of the human system thus loaded with morbid humors, thus impoverished in its power of eliminating them from the blood. A "casus belli," in the shape of a disturbing cause, takes place; it may be mental emotion, muscular exertion more than common, a cold wind, a shower of rain, wet feet, some error of diet. The organism, in a state of health, has the power of resisting a disturbing cause of considerable intensity; but now, in the condition before us, enfeebled by the poisonous state of its own blood, it yields before one of an apparently trivial kind. The immediate effect of the disturbing cause is to depress the nervous energies; elimination, before retarded, becomes suspended, accumulation of morbid humors to excess follows, and the organism is for the moment overwhelmed. For an instant Nature staggers under the sudden load, but quickly afterwards reaction ensues; the "vis vitæ" collects all its strength for one great effort to expel from the blood its morbid burden; the morbid matter is driven to the surface, causing congestion, and forced elimination commences. We may ask what determines the seat of the congestion? to which the answer is plain,—temperature, season, age, idiosyncrasy, previous debility or disease, the predisposing or the exciting cause. In the cold seasons of the year, the morbid humors, driven for elimination upon the mucous membrane of the lungs, may occasion bronchitis; in warmer weather they may be precipitated on the mucous membrane of the alimentary canal, causing diarrhœa;

under the influence of moral excitement, the result may be apoplexy; or, in other states of the system, gout, rheumatism, or neuralgia; or, in the absence of, or even in association with any of these, the seat of elimination may be the skin, and the result an eruption of erythema, lichen, or eczema.

In the treatment of acute disease of the skin, the principle is, as we have seen, to subdue the feverish excitement, to neutralize and eliminate the morbid salts. In chronic disease, and in the chronic stage of acute disease, all this must be done, and at the same time the powers of the system must be kept up; in other words, we must conjoin with an antiphlogistic, neutralizing, and eliminating plan, an invigorating or tonic treatment. Sometimes we meet with instances of depression of the animal powers from simple accumulation of morbid humors, in which case simple elimination by purgative medicines strengthens the entire frame, and that which might be presumed to lower, actually heightens the power of the patient. At other times, and more frequently, we are early made aware that the disease is one which, in popular language, is ascribed to "poverty of blood," and our tonic system must begin from the commencement of treatment.

Let us suppose a patient suffering from chronic cutaneous disease sitting before us; and pen in hand, we proceed to draw up the prescribed course of treatment; what are the indications to be fulfilled? They are *firstly*, to eliminate; *secondly*, to restore power; *thirdly*, to alleviate the local distress. To *eliminate*, we must secure the proper action of the bowels, liver, kidneys, and skin. To *restore power*, we appeal to tonics, which we usually conjoin with eliminants. To *alleviate the local distress*, we resort to local means. We will consider these indications, with our means to fulfil them, in detail.

To *eliminate*, our remedies are purgatives; but in the use of these agents, we must endeavor to imitate the operations of nature, who works always by gentle means. Our purgatives must be efficient, but mild; the colocynth pill, for example, with blue pill, to secure the discharge of the biliary secretion; henbane, to prevent pain from the action of the pill; and soap, to secure its solution. Sometimes, to effect a more decided excretion from the mucous membrane, we may add to the compound colocynth pill, ipecacuhan, or squill; or sometimes, simply soap. In certain constitutions, a pill composed of the watery extract of aloes, with a bitter extract, such as gentian or chamomile, acts better than the colocynth pill; sometimes the compound rhubarb pill, and sometimes a scruple of guaiacum, with ten or fifteen grains of the bicarbonate of potash, or a drachm of the bitartrate. The best time for the exhibition of the aloetic and rhubarb pill is immediately before dinner, and for the colocynth pill and guaiacum, at bedtime. They should be continued through the cure, unless contra-indicated by an unpleasant effect produced upon the patient; and they should be taken daily or less frequently, as may seem most desirable. It must, however, always be borne in mind, that the safety of the patient demands, before the local excretion is checked, that a drain in a more natural direction, and of a more natural kind, should be established to supply its place. For this

reason, I make elimination the first and most prominent of the indications to be fulfilled in the treatment of cutaneous diseases.

To *restore power* is an indication which must be attempted concurrently with elimination. While the latter carries off the morbid humors the former is intended to give tone to the assimilative organs, and secure a supply of better and more wholesome nutritive fluid. The old material of the organism is to be swept away, while new and sounder material is added in its place. Under this head we have to consider tonic medicines and a proper system of diet. We exhibit tonics on the one hand, while on the other, we keep up an active movement of the excretions by means of laxatives and purgatives. We may select nervo-tonics, such as quinine or quinine and iron; tonic-eliminants, such as gentian combined with potash; or tonic-alterants, such as gentian with the nitro-muriatic acid. These remedies may be administered twice or three times in the day; the simple tonics, nervo-tonics, and the gentian and nitro-muriatic acid, an hour before meals; the tonic alkalines three hours after meals. If the rheumatic, the gouty, or the lithic acid diathesis be present, a preference may be given to the tonic alkalines; but as alkalies, long continued, weaken the crasis of the blood, and lower the tone of the system, their effects should be watched, and as soon as any lowering action is discovered, they must be suspended, and their place supplied by invigorating tonics. The nitro-muriatic acid will often eliminate the morbid fluids, without being open to the objection of lowering the tone of the system, and hence may be substituted advantageously for the alkalies, even from the outset of the treatment, and before the lithic acid diathesis has been corrected by other means.

The *diet* most suitable for cutaneous diseases, and especially those of a chronic kind, is a nutritive animal diet, moderate in quantity, but sufficient for comfort as well as mere necessity. A judicious blending of animal and vegetable food for breakfast; namely, meat, ham, bacon, eggs, butter and bread, with tea, or cocoa made from the nibs, not exceeding a single breakfast cup, and abstinence from sugar. Coffee is more heating than tea, and a check to the active operations of nutrition, and therefore not so good; but if taken, it should be so without sugar, or with as little sugar as possible. For the mid-day meal (lunch or dinner, as the case may be), meat, vegetables, and a moderate amount of sherry with water, soda-water, or seltzer-water, or any simple spirit in place of wine, such as brandy or whiskey. Malt liquor is objectionable, from the large quantity of sugar which it contains; but other vinous drinks which contain no sugar, or a minimum of sugar, may be taken, if preferred, such as Bordeaux, Rhenish wines, and dry Champagne. Puddings and tarts are prohibited, with the exception of plain suet pudding; the whole family of light puddings are indigestible and detestable. For the third meal of the day (dinner, tea, or supper), the second meal may be repeated, the fluid taken with the meal being like that of the previous meal, or simply tea without sugar, or with the minimum of sugar, as already mentioned. Sometimes the third meal of the day is a simple cup of tea, or two small cups, and to this, provided sugar be avoided, no objection can be made. When

this is the case, a fourth meal succeeds (dinner or supper), the components of which have been already considered. There are certain articles of diet against which an unfounded objection prevails, and others, with as little reason, which are popularly received with favor. Ham, salted meats, and vinegar fall into the first category; water-cress into the last. Ham and salted meats, at the present day, are so little injured as articles of diet by the process of preserving, that I cannot conceive any objection to their occasional use; certainly more good would result from their being taken, if the appetite urged in their favor, than harm from their supposed toughness and indigestibility, or from the quantity of salt which they might be thought to contain. The salted meats of the present day are not the salt junk or salted pork of the time of Anson's great voyage round the world, when his men were exhausted with scurvy, from their exclusive dependence on those articles of food. Vinegar is antiseptic, and an aid to digestion: in some constitutions, it produces flushings of the face, and nettle-rash; but this is an exception to the rule, and, as an article of diet, vinegar may be pronounced to be perfectly wholesome. I cannot speak so favorably of pickles, which come under the designation of crude vegetable matter, which is certainly indigestible and difficult of assimilation. Salads are of this class, and especially that singularly-favored and supposed antiscorbutic, the water-cress. The only redeemable quality of the water-cress is its pungency, which gives warmth to the stomach; the mustard and cress, on the same principle, give their medicine to the salad, but the salad is only rendered less innocuous by the large quantity of aperient oil of olives which it should contain. Potatoes may be ranked with objectionable articles of vegetable diet, and should be taken only in extreme moderation.

We now come to *local remedies*, which may be divided into two classes,—those which simply defend the eruption from external irritation, and those which stimulate and produce an alterative action in the skin. Of the former kind are water-dressing, fomentations, certain lotions, and certain ointments; of the latter kind are other lotions and ointments. The water-dressing, acting as a poultice, facilitates the relief of the congested vessels of the skin by promoting secretion, and is suitable to the early stages of the disease. But water-dressing, too long continued, destroys the tone of the skin, and retards the cure; and the moment must be watched when this remedy has performed all the good of which it is capable, to change it for another, which will continue the good that has been already commenced. Fomentations, either of plain water or decoction of poppy-heads, may be used separately or in conjunction with water-dressing; they relieve heat and pain, and facilitate excretion by the skin. The lotions of a cooling and soothing kind are,—the spirit-lotion, lead lotion, emulsion of bitter almonds with hydrocyanic acid, &c. But against all lotions an exception may be entered from the first: for a time, and during application, they are agreeable and useful; but when the surface dries up, the stiffness, uneasiness, and distress return, and are even greater than before. For this reason I rarely make use of lotions as soothing or protective remedies. In the next degree to lotions comes a lini-

ment of oil and lime-water, such as is kept for scalds and burns, which may be used either alone or in combination with liquor plumbi or tincture of opium. Among ointments of the soothing class are, simple cerate with liquor plumbi, simple cerate with camphor, the calamine ointment, and the oxide of zinc ointment.

When first I commenced the treatment of diseases of the skin, water-dressing had just been introduced, and suddenly became the surgical fashion of the day, while a general outcry was raised against ointments—"greasy applications," as they were contemptuously called. Finding that in practice it was impossible to contrive any substitute for ointments, in the treatment of these diseases, and being unable to discover any cause for the objections raised against them by my contemporaries, I set myself to inquire into the possible reasons of their disrepute. This was soon ascertained: they were ill-prepared, long kept, and, in many instances, so rancid as to act as irritants and aggravators of the disease. On the other hand, when properly prepared and perfectly fresh, ointments are all that can be desired as local applications. Again, it is to be remembered that a cutaneous eruption, by virtue of the inflammatory congestion which exists, is an actively oxidizing surface, and ointments perfectly fresh when applied, are apt, by absorption of oxygen, to pass quickly into a state of rancidity. Hence we have not only to regard the purity of the ointment in itself, but also its tendency, when applied to the inflamed skin, to develop those acids of decomposition which constitute the rancid state. Thus the same ointment, according to its state of freshness or otherwise, may be a soother, or an irritant of the most mischievous kind, when applied to the skin. The power of gum benjamin in preventing decomposition in ointments is an important discovery, and is now pretty generally adopted by our London chemists. This gum, in a state of powder, added to the melted lard in the proportion of ten grains to the ounce, the ointment being subsequently filtered through paper, not only serves to preserve the ointment for a much longer time than it would otherwise remain fresh, but also gives it an agreeable odor, a condition of some importance where an application is required to be kept on the skin during the period required for cure.*

* Mr. Julius Schweitzer, in a paper published in the "Chemical News" for August, 1860, on the Unguentum Zinci, details the history of the parent of the oxide of zinc ointment, the ceratum de lapide caliminari of Daniel Turner, the Turner's Cerate of the present time. The lapis caliminaris is, as he explains, a native carbonate of zinc; but, being often made of impure materials, and adulterated to please the eye and seem like the original, the cerate fell into disrepute, and oxide of zinc was substituted in place of calamine. The next difficulty was the procuration of a pure oxide of zinc; the old process afforded a very imperfect article, mingled with carbonate of zinc, and even with sulphate: "The Pharmacopœia of 1836 published a process which produces a pure anhydrous oxide, differing from all the former compounds by its greater density, slight buff color, and far greater purity." Again, the eye test and public prejudice did their best to deteriorate this substance; and, but for the efforts of Mr. Redwood, might have succeeded. The buff color was thought to indicate impurity, which is not the case; but happily an experienced manufacturer, Mr. Hubbuck, stepped in and supplied an equally pure white oxide; so that we have now two oxides of equal purity, and only differing, to all appearance, in their tint of color. I have always given a preference to the ointment made with the buff oxide, without knowing why; but Mr. Schweitzer, in his remarks, helps us to an explanation. "Fats and

The benzoated oxide of zinc ointment, properly prepared, is the most perfect local application for all chronic inflammations of the skin that is known. It is cleanly and agreeable, of a cream white color, not diffluent and oily like other ointments; and it has a tendency to concrete upon the skin, and constitute an artificial cuticle to an irritated and denuded surface. It is rendered further acceptable to an inflamed and heated skin by the addition of spirits of wine, in the proportion of a drachm to the ounce; or, if preferred, spirits of camphor. The mode of application of this and other ointments is a matter for attention; it should be gently smeared upon the eruption with the finger, or, if the diseased skin be too tender, with a camel's hair brush, smeared so as to distribute it in a moderately thick layer over the whole of the affected part, to introduce it into all the cracks and hollows that may be present, and to insinuate it as much as possible under any crusts that may have formed on the disease. Once properly applied, it will loosen the crusts and prevent further crusts

oils," he says, "when in contact or mixed with metallic oxides, soon turn rancid, a circumstance which gave dispensing chemists a great deal of trouble with seemingly quite simple and unimportant articles of their stock, namely, a few ointments, amongst which the unguentum zinci, the most delicate and nicest-looking, may well be said to be the principal one. All animal substances will only keep good for a limited space of time, and such preparations as pomatums and ointments may fairly be said to be subject to certain deterioration by age; nevertheless it was a well observed fact, that some of the French pomatums retained their original sweetness for an almost unlimited space of time, the cause of which was long a mystery desirable to be ascertained. At last it became known that this property was due to an addition of gum benzoin, or benzoic acid, a proceeding which in one instance we had already adopted. In the preparation of those singular-looking little bottles of pomatum known under the name of 'Pomade divine,' amongst a host of other ingredients, we are directed to digest gum benzoin with the fat at a gentle heat for about forty-eight hours. But it was left to the late Mr. Bell to draw our attention particularly to the preservative property of the gum benjamin, of which he proposed to avail himself in the preparation of an unguentum zinci benzoatum. This proposition was eagerly accepted, and medical men and chemists will still remember Mr. Bell by this, one of his last improvements in pharmaceutical chemistry,—the unguentum zinci benzoatum.

"This ointment is made by selecting the best and most fragrant gum benzoin, the so-called benzoin in tears; this, when comminuted, is added to good fresh lard, in the proportion of ten grains to the ounce, and the whole digested in a water bath for about forty-eight hours; this, subsequently strained, is used for the preparation of the benzoated zinc ointment.

"In making this ointment with two oxides of zinc, a difference of reaction will be observed between the oxide made by combustion and that made according to the Pharmacopœia, which, slight as it may be, deserves nevertheless some attention. The buff-colored oxide of the Pharmacopœia seems readily and speedily to amalgamate with the benzoated lard, so much so as sometimes to impart to the whole still warm fluid a certain consistency, which in far greater degree becomes more observable when the ointment is cold. Subsequent experiments showed that the seemingly lighter oxide of combustion resists with greater effect the influence of weaker acids, while the dense oxide of the Pharmacopœia is readily dissolved by them.

"This chemical difference is in all probability the cause of the different behavior of these two oxides when used for the unguentum zinci benzoatum. Benzoic acid is readily dissolved by fats and oils; and in digesting the gum for some time with the lard, this acid, as well as the aromatic principles, impregnates the fat, and subsequently acts on the zinc. How far this greater susceptibility to weak acids may be by itself a beneficial application to a wound is a surgical question; but it is a well-known fact that many of the most skilful and eminent surgeons always prefer the buff-colored zinc ointment to the perfectly white one made with the new oxide of zinc of combustion."

from collecting, while it serves the several purposes of a new cuticle to the abraded skin, a water-dressing, and a barrier to the rapidly oxidizing action always present in inflammation. If secretions are poured out, the eruption may be wiped, but not washed, and a fresh application of the ointment may be made morning and night, or as often as the previous layer of ointment has been disturbed or displaced.

If we look upon an ointment when applied in this way to the skin in its true light, we shall see that it presents conditions and advantages which no other local application possesses; and we cannot but arrive at the conclusion that it is a most valuable remedy, and one for which no equally efficient substitute can be found. It is light, produces no pressure, is thin as a film of varnish, and yet excludes the air from the inflamed part, thus preventing desiccation and oxidization, and it retains the ordinary moisture of the skin, acting, as I before remarked, as a water-dressing, or natural poultice. Moreover, it in no way interferes with the use, at the same time, of other local applications which may be thought necessary, such as the evaporating lotion, fomentations or poultice. I make it a prominent part of my directions, that the morbid part should not be washed after the application of the ointment; it may be wiped with a soft napkin as much as may seem necessary; but when the ointment is once applied, it should not be removed by washing without good reason.

The *stimulant and alterative local remedies* are lotions containing the bichloride of mercury, lotions of bicarbonate of ammonia, acetate of ammonia, vinegar, creasote, sulphuret of potash, &c., and ointments of the salts of mercury, tar, creasote, sulphur, &c. The intention of these applications is expressed in their title; they are intended to stimulate in various degrees, to set up a new action, to restore the tone of exhausted nerves, and establish an alteration of function; hence the terms stimulant and alterative. The lotion of bichloride of mercury in emulsion of bitter almonds, in the proportion of from one to three grains to the ounce, is an admirable stimulant in cases of torpid skin, such as impacted sebaceous follicles of the face, excess of oily secretion, and acne, and is also useful in pruritus. The lotions of acetate of ammonia, vinegar, creasote, and sulphuret of potash, are also excellent remedies for relieving pruritus. As a stimulant application for chronic erythema and eczematous or lichenous psoriasis, there is no better remedy than the unguentum hydrargyri nitratis, diluted more or less according to the amount of stimulation required to be effected; it is also admirable in that chronic affection of the eyelids, psoriasis palpebrarum. For chronic erythema or pityriasis of the scalp, I prefer the unguentum hydrargyri nitrico-oxydi as being a more cleanly application; and for a similar reason, I sometimes give a preference to the unguentum hydrargyri ammoniochloridi. The questions, to soothe, or not to soothe, to stimulate, or not to stimulate, often press themselves on the attention of the medical man, and he must be ready to decide these questions when they arise. Not unfrequently, the credit of the physician turns upon his decision in these simple matters—simple, it is true, only in the abstract; for they may be of vital importance to the patient. I have seen cases

wherein the mere omission of a too stimulating or an irritating application has been followed by a rapid cure; and the medical man who ordered such a remedy has consequently fallen in the estimation of his patient. On the other hand, I have seen cases in which a stimulant boldly used has brought about an immediate cure. The tact of the practitioner lies in the being able to determine which of the two is the proper course. In chronic affections of the skin, it often occurs to us to see medical men, thwarted by some obstinate disease, have recourse to a method which cannot be too strongly condemned, namely, that of *trying* a succession of remedies; and if they be new and unknown, perhaps foreign, they seem to have an additional charm. The word *try* implies doubt, uncertainty, experiment; and the question arises, what right have we to make experiments of unknown remedies upon our patient? and which of our patients shall we select for the purpose? These are serious questions, and questions that appeal to the *religio medici*. To *try* a succession of soothing remedies where we have determined that the indicator points to soothing, is legitimate; to *try* graduated stimulants when the soothers have failed, is also correct; and to *try* a succession of stimulants, equally so. But to *try* like a man in despair, catching at this or that, whichever may come first into his mind, without a settled principle of action, is unscientific to medicine and dishonest to our patient. It is this which gives rise to the frequent instances we meet with, of a succession of changes of treatment without plan, without order, and even without the time necessary to determine the effects of the varied means; whereas, were the selection of a remedy judicious, and the principle of its selection sound, the practitioner would but have to carry it out with patience and discretion, to insure an ultimate success.

Next in order to mercury, I must place sulphur as a cutaneous remedy of the class of stimulants; the simple sulphur ointment of the Pharmacopœia, either alone or with the addition of camphor—the unguentum sulphuris hypochloridi compositum—an old remedy, revived and much used by myself, and the iodide of sulphur ointment. The use of sulphur in scabies, as a destroyer of the acarus scabiei, is generally recognized, and the simple ointment is perfectly adapted to this use. The compound sulphur ointment is an unnecessarily violent remedy for that purpose, and I have never had occasion to use it. It must always be borne in mind that sulphur is a stimulant, and if continued too long, or used too largely, will become an irritant also, giving rise to erythema, lichen, and even to an eruption of pustules. Hence the apparent perpetuation of scabies in the eyes of those who see in that disease only an eruption of papules, vesicles, and pustules. But because sulphur is the remedy for scabies, it would be absurd to fall into the error of supposing that all eruptions susceptible of cure by the use of sulphur are therefore scabies. I note this error because I have seen it committed, and therefore caution the practitioner against it. Where, as in a chronic inflammation of the skin of long duration, such as chronic erythema, pityriasis, or psoriasis, the obvious indication is a stimulant, or discutient, then the sulphur ointment is a good and effective remedy, and in this capacity

may be placed by the side of the mercurial ointments. Hence, sulphur may be found to cure many varied infirmities of the skin, when the stimulating element is the one required. In scabies it is specific; in other affections it is simply an individual member of the class of stimulants. The same remarks apply to sulphur in other forms, and notably to the sulphur vapor bath. I have seen sulphur ointment applied to the inflamed skin in a case of eczema rubrum, and worse than that, in a case of eczema impetiginodes; a stimulant to an organ in a state of acute inflammation, as if the general principles of medicine and common sense were to be wholly abandoned, because the case was one of skin disease. Such errors, it is to be hoped, will not be repeated. Again, in a case which especially calls for a stimulant application—namely, acne—both the indurated and rosaceous kind, the unguentum sulphuris hypochloridi compositum is an excellent remedy.[1]

It is not sufficient in medicine to possess a good remedy, it is also necessary that we should know how to employ it. To know the remedy is a qualification that belongs to the science of medicine; to know how to use it is an attribute of the art of medicine; and in practice the former avails little without the latter. A bad remedy, judiciously used, is often more advantageous than a good remedy abused in its application; and the experience of daily medical life shows that much of this want of practical knowledge subsists among us. The skilful workman may effect his purpose with bad tools; but the unskilful one will fail even with the best. Indeed, the success of a medical man, his reputation as a healer or theorist, a learned theorist maybe, turns upon this talent of application of science to the purposes of art; to know it and to do it are not synonymous; and in exerting myself to create a new school of cutaneous medicine, I am anxious to make doers in preference to mere knowers. And this, as an introduction to the use of the hypochloride of sulphur ointment. In the application of a soothing ointment, such as that of the benzoated oxide of zinc, the contact with the inflamed part should be gentle, yet sufficient to reach all the vacuities and interstices of the surface; but in the case of a stimulant, the combination with the remedy of another form of stimulation, namely, friction, is not undesirable. This remark applies equally to all stimulant topical remedies, which may be increased in their stimulant properties to almost any degree by the addition of friction. Thus, in a case of chronic indurated acne, I recommend the affected skin to be rubbed with a towel before the application of the hypochloride of sulphur ointment, and the latter to be afterwards rubbed into the skin with a certain amount of friction. This is to be done at bedtime, the ointment left in contact with the skin during the night, and well washed off with soap and water in the morning. The iodide of sulphur, as an ointment, containing from ten to twenty grains of the salt to the ounce, is a cutaneous stimulant applicable to several chronic affections, and especially to sycosis.

[1] The formula for this ointment and other special formulæ, referred to in the course of the work, will be found in the "selected formulæ" at the end of the volume.

Tar has long enjoyed a reputation in cutaneous diseases, both as a specific internal remedy and as a local application. In the former capacity we may defer its consideration for the present, and only regard it as a local remedy. The forms in which it is chiefly known to us are—tar-water, the unguentum picis liquidæ et nigræ of the London Pharmacopœia; the Barbadoes tar, or naphtha; the juniper tar, or oil of cade; and creasote. The tar ointments of the Pharmacopœia are stimulant and antiseptic; and are mostly used in chronic affections of the scalp, and for a class of patients where nicety and refinement are matters of secondary moment. The tar-water, Barbadoes tar, and creasote, are also stimulant and antipruritic; but the most elegant of these remedies is the juniper tar, for which, in the shape of ointment, a formula will be found among the "selected formulæ" at the end of the volume. The juniper tar is also made applicable to pruritis of the skin, in the form of an ointment. In that most distressing of all the forms of pruritis, namely, pruritus pudendi, the juniper tar ointment has proved more successful than any other remedy with which I am acquainted.

Having said thus much on the general remedies applicable to diseases of the skin, let us now proceed to the consideration of one which enjoys a reputation of a *specific* kind—namely, ARSENIC. Arsenic is known to us as a tonic, as a corrector of mal-assimilation, as a stimulant of the nervous system, and as a stimulant also of the surface of the body, both cutaneous and mucous; in other words, an alterant-cutaneous tonic. Educated on the banks of the Thames, where ague is endemic, I have been in the habit of administering arsenic from my boyhood, when quinine was a luxury too costly for the agricultural laborer and parish pensioner. Arsenic at that time enjoyed a high reputation as a tonic and anti-periodic, and properly administered was as safe a remedy as bark or quinine; my further experience of arsenic, spreading over many years, is equally in its favor; and administered with caution, in proper cases and at the proper time, I believe it to surpass every other remedy known. It is a power as simple, as manageable, and almost as certain, as the steam-engine, and to my thinking is one of the most valuable of the therapeutical possessions of medicine, ranking, in this respect, with opium and quinine.

While vindicating thus warmly the claims to respect of an excellent medicine, I would equally strongly declaim against its abuse. It is known to be useful in cutaneous disease, and therefore it has been used in all cutaneous affections; it is admirable in certain stages of some, and the only known remedy in one particular disease; and yet it has been administered indiscriminately in all stages of these diseases, and almost without any principle to determine its preference. This is a melancholy abuse, disgraceful to our colleges, and disgraceful to the profession of medicine, and ought to have a speedy end.

Arsenic is rarely administered at the present day in its crude form; the Asiatic pill[1] is the only preparation of the arsenious acid that occurs to me. When sulphur first obtained its reputation for the cure

[1] *Vide* "Selected Prescriptions."

of diseases of the skin, it was wont to be taken in its raw state, wherein it is found to contain a certain amount of arsenic. But since sulphur has been submitted to the refiner, and the arsenic is withdrawn, its virtues as a cutaneous medicine have ceased, and it is scarcely used now but as a popular remedy. The preparations of arsenic at present in use, are,—the arsenite of potash; arseniate of soda; arseniate of ammonia; arseniate of quinine; Fowler's solution, namely, solution of the arsenite of potash; De Valangin's solution, namely, the liquor acidi arseniosi hydrochlorici, vel liquor solventis mineralis; the potassio-tartrate of arsenic; iodide of arsenic; and Donovan's solution, or the liquor hydriodatis hydrargyri et arsenici. These different forms have each their different conveniences to the prescriber; the combinations of arsenic with the alkalies and hydrochloric acid are well adapted for administration with meals; the arseniate of soda may be given in powder or pill; the arseniate of quinine and iodide of arsenic are also suited to administration by pills; and Donovan's solution is a useful combination of iodine and mercury with arsenic. Formulæ for these preparations will be found at the end of the book. Those which I principally employ are, Fowler's solution, De Valangin's solution, the arseniate of soda, and Donovan's solution.

The standard dose of arsenic in skin affections is five minims of Fowler's solution, equivalent to $\frac{1}{24}$th of a grain of solid arsenic or arsenious acid, and the frequency of its administration is three times a day, making the daily dose amount to $\frac{1}{8}$th of a grain, about one grain a week, or four grains a month. In this dose, which is as large as is ever required for cutaneous disease, the remedy may be taken without inconvenience for months, and even for years. In mentioning its medicinal properties I have said that it is a stimulant to the mucous membrane, a stimulant to the nervous system, and a general tonic; and to these effects I may add, that it is a local irritant when brought in contact with the mucous membrane: exciting in this latter capacity, pain, spasmodic griping, and nausea. The art of using arsenic with advantage is to escape its inconvenient effects, and encourage such as are favorable to our purposes. To avoid nausea, we administer the remedy in its most simple form, and with as little offence to the stomach as possible; thus we distil our five drops into the fluid which our patient takes with his meal, or, better still, we drop them on a piece of bread, and require that the bread should be eaten with the meal; and to render them still less objectionable, I am in the habit of prescribing a liquor potassæ arsenitis, in which the tincture of lavender is omitted; the flavor of the latter being inconsistent with our intention of soliciting the favor of the stomach. Again, to insure exactitude of dose, I prefer to combine with the arsenical solution some simple fluid, such as the tincture of ginger, in the proportion of three parts to one, so that the dose becomes magnified to twenty drops, and the chances of error of dose diminished in equal proportion. Sometimes the convenience of the patient is met, by combining the arsenic in a pill, in which case the arseniate of soda is the preparation to be selected.

Another precaution in the use of arsenic, and one which is intended

to prevent irritation of the mucous membrane of the stomach, and its consequences, uneasiness, pain, griping, and nausea, is, its administration with a meal, *during* or *instantly after* a meal. By this means, we secure the admixture of the five drops with the whole mass of the meal, its distribution over an extensive surface, its dilution, in fact, and we avoid as far as we are able, the contact of the arsenic with the mucous membrane. We gain another end, also, by this mode of administration of the medicine: we secure its thorough incorporation with the chyme, and its immediate transmission into the blood with the chyle and other absorbed fluids. This is a reason why we are enabled to effect a cure with so small a dose; the whole, or nearly the whole of the arsenic, it is to be presumed, is taken into the blood, and is thus conveyed into the most favorable position for exerting its medicinal effects.

While following a course of arsenic, we prohibit our patient crude vegetable matter, indigestible articles of food, and excess of acids; and we may be strict or otherwise in this prohibition, according to the effects of the medicine. In some persons, the mucous membrane is tender and easily irritated; in others, the arsenic produces no inconvenient effect, even in the midst of dietetic irregularities. Sometimes it may be found desirable to administer the remedy twice instead of three times a day, and sometimes to reduce the dose to four or three minims. In these cases, we may watch the moment for restoring the dose to the ordinary standard of five drops. As the standard dose of arsenic is extremely moderate, it calls for little variation with difference of age; an infant at the breast will take two minims without inconvenience; from two to seven years, the dose may be three minims; from seven to fourteen, four minims; and after fourteen, the standard dose of five minims.

I have alluded to one disease in which arsenic is specific and the only remedy—I mean lepra; in this disease we have most experience of its use and of its effects. It presents remarkable variety as to the time required for producing its constitutional action; and in this respect differs essentially from mercury. We can hardly look for any indication of its operation on the skin in a less period than from three to six weeks, and often this period is protracted to a much longer interval. It would seem to be cumulative in its effects, and to reach its point of saturation, in other words, to evince its constitutional action, suddenly, and often unexpectedly. The completion of saturation is sometimes announced by congestion of the conjunctiva, and sometimes by a rapid disappearance of the eruption from the skin. It is a curious phenomenon, to observe with what extraordinary rapidity a lepra of many years' standing will get quite well, every spot vanishing completely, when the happy point of saturation is reached by the arsenic. I have repeatedly seen cases wherein no effects were visible after months of regular use of this medicine; and in three weeks afterwards, every trace of the disease had disappeared.

As arsenic, besides acting on the skin as a cutaneous alterative, is also a stimulant of the nervous system and of the mucous membrane, and as its action upon these latter must take place during the adminis-

tration of the remedy, sometimes concurrently with its action on the skin, and sometimes independently of that action, we have now to consider the nature of these phenomena, that we may stop the use of the remedy the instant any symptoms arise which may be deemed injurious; in other words, the instant the poisonous effects of arsenic begin to be evinced. I have already said, that when acting unfavorably, arsenic will produce uneasy feelings of weight or sinking at the epigastrium, and nausea; it will also produce vomiting, griping, diarrhœa, sometimes constipation and suppression of urine, dry cough, stiffness in the throat, soreness of gums, sometimes ptyalism, rigidity and weight of the eyeballs, and congestion of the conjunctiva; all these symptoms being referable to congestion of the mucous membrane. The symptoms referable to the nervous system are, extreme restlessness, sleeplessness, sensation of faintness, numbness and tingling in the hands and feet, and headache. Sometimes when the remedy acts with more violence on the skin than on other organs of the body, there may happen an arsenical erythema.

Now upon the occurrence of the slighter of these symptoms, as soon as they reach the point of real inconvenience or distress, the patient is instructed to suspend the remedy, until the feelings of discomfort have subsided; and then to resume it. A suspension of a few days, or at most for a week, will, in general, be sufficient for the dispersion of the threatening symptoms; and as soon as this happens, there can be no objection to beginning and continuing the medicine as before. By taking this simple precaution, I rarely meet with cases wherein the arsenic may not be continued for a period necessary for cure, unless in persons of peculiar idiosyncrasy, who are unable to take the remedy even in the smallest doses.

And now it may be asked, What are the cases in which the use of arsenic is indicated? Arsenic is applicable to cases of determined mal-assimilation when the eruption is chronic from the commencement, or has passed its acute stage, and the chronic condition is perfectly established; it is applicable also to those chronic forms of eruption which from long continuance are deemed inveterate, such as psoriasis; and it is also applicable, but this time as a specific remedy, to lepra. With the exception of lepra, arsenic is not to be employed until the general symptoms have been combated by general remedies, and until the general disorder of the digestive and circulating systems has been removed—not even until ordinary tonics have been given without effect, and the tonic alterative powers of arsenic remain as a last resource. This is my practice in cutaneous disease, not from any fear of the effects of arsenic, but simply because a large majority of these cases may be cured by general means judiciously applied and steadily pursued; and when all have failed, then comes the time for this admirable medicine. The same remarks apply also to lepra when complicated with erythema or eczema, as we sometimes find it to exist; in this case, the complications should be first subdued by appropriate general treatment, and then the specific employed; on the other hand, when the lepra is simple and uncomplicated, and the

general condition and tone of the patient moderately healthy, the arsenical treatment may be commenced from the outset.

I have once more to draw attention to the fact of the existence of two modes of action of arsenic—namely, its primary or tonic action, by virtue of which it corrects and regulates assimilation; and its secondary or stimulant action, which it exercises on the skin. It is in the first of these capacities that it becomes the efficient and curative tonic at the close of febrile eruptions, and produces its effects as quickly as an ordinary tonic. In its secondary or stimulant capacity, it requires time to enter the blood, to diffuse itself through the system, to reach and operate upon the tissues of the skin, and probably be eliminated by the skin, and to excite in the skin that discutient power by means of which the eruption is finally removed. In the latter mode of operation it gives rise to congestion of the conjunctiva, congestion of the skin, commonly denominated arsenical erythema, and an erythematous excitement of the patches of lepra which commonly precedes their departure. This erythematous condition of the patches of lepra, which is the frequent precursor of their dispersion, is one of the signs of the constitutional action of the remedy which the dermatologist looks for with interest; as is the occasional appearance of a fresh outbreak of the eruption after the remedy has been continued for a sufficient length of time.

I have remarked upon the curious fact, that arsenic is well borne by infants and young children: in them it evidently exerts its tonic influence on the assimilative powers, and evinces its good effects with marvellous rapidity. I know of nothing more striking in the practice of medicine than the celerity with which one of the most unpromising eczemata will get well under the influence of arsenic when judiciously administered. I have seen such a case cured in a week, or, at most, in two or three weeks, a perfect triumph of medicine. It is clear that in these cases the medicine has not time to produce its secondary action on the skin, and that the cure must result from its primary tonic action on the assimilative organs.[1]

[1] I had recently a conversation with a manufacturer of the salts of arsenic, who assured me that the men employed in the works experienced no inconvenience from the constant inhalation of that substance, nor was their longevity influenced by the nature of their occupation. Mr. Arthur Church, in a note published in the "Chemical News" for August, 1860, on the arsenical water of Whitbeck in Cumberland, after stating that the water contains a very perceptible amount of arsenic, namely, a fraction of a grain to each gallon, "probably derived from the veins of arsenical cobalt ore through which it percolates," observes: "The arsenical water is *habitually used for every purpose* by the inhabitants of the little village of Whitbeck, and, as far as I can learn, with beneficial rather than injurious results. But it is remarkable that Whitbeck, though in every respect suitable for trout, is the only stream in the neighborhood from which that fish is absent; eels, however, have been found in it. Ducks will not live if confined to this arsenical water. When the railway was being carried past Whitbeck, the first use of the water quickly produced the usual marked effect on the throats both of the men and horses employed on the works. The soreness of mouth from which they at first suffered soon however disappeared, and in the horses gave place to that sleekness of coat assigned as one of the effects produced by the administration of arsenic. It is a question how far the rosy looks of the Whitbeck children, and the old age which a large proportion of the inhabitants of the village attain, are to be attributed to the arsenic present in the water they drink."

Tar and pitch, used as internal remedies, probably act upon the skin as eliminant stimulants, and require to be taken for a long period to produce their effects. They may be employed where there is great intolerance of arsenic, and in similar cases, but I do not attach any value to them as a medicine. Pitch is administered in the form of pills, of which a large number have to be taken daily; but a more efficient remedy is the Barbadoes tar, which is inclosed in capsules, and requires the exhibition of a less quantity. The cases to which tar is particularly suited, are chronic erythemata, including pityriasis and psoriasis, and lepra. I have not had much experience of their effects, believing that I had other, more active, more convenient, and, I may add, more certain remedies within reach; and it has only been as a variation to the arsenical course, or in persons who were unable to take arsenic for a sufficient time to be useful, that I have had recourse to them.

Cod-liver oil has been spoken of in connection with cutaneous diseases, and cod-liver oil has consequently been made the subject of *trial;* sometimes with benefit, and sometimes the reverse; the usual fate of good remedies *tried* without any principle to guide or determine their use. I have said that I regard mal-assimilation as the essence of cutaneous disease; with mal-assimilation there is necessarily more or less of mal-nutrition, and with the latter emaciation. Now, these are the cases for cod-liver oil, and in them cod-liver oil is an excellent remedy. Cod-liver oil improves nutrition; with improved nutrition there is an advance of general power; and with general power, a better assimilation returns. The medicinal virtues of cod-liver oil are therefore such as result from its easy adaptation to nutrition; in this sense it becomes an admirable tonic, like beef and mutton, but one which may be employed when the appetite is opposed to the latter. Some time back, it occurred to me to make trial of cod-liver oil in a dietetic form, and with the willing aid of an ingenious chocolate manufacturer [Mr. Lebaigue, of No. 9 Langham Street, St. Marylebone, by whom this chocolate is now manufactured under a patent-right, to secure its purity; its price is four shillings the pound, each pound containing four ounces of cod-liver oil, or one part in four; the pound is grooved into thirty-two tablets, each of which, therefore, contains one drachm of oil and three of chocolate, and may be taken as a dose] I soon had at my disposal an ample supply of cod-liver oil chocolate, and believed that with a dietetic substance of this kind, I should be able to overcome the repugnance which some persons, children in particular, have to swallowing oil; that I should present the oil to the stomach in a state more favorable for the assimilating process; that I should escape the nausea resulting from the presence of undigested oil in the stomach, and that a small quantity of oil would be more effective than a larger dose administered in its crude state. My anticipations in all these particulars were fully borne out by the result, and I found myself in possession of a valuable dietetic medicine. To be quite certain of its powers, I confided it to my brother to use among my poorer patients; and he reports to me that he found it most serviceable with children; that in many instances

he used no medicine but a simple aperient to regulate the bowels, and that the improvement in the condition and disease of these children, in the course of a week, was really marvellous. He observes, moreover, that the cases which he selects for the use of the chocolate are such as evince a distinctly mal-assimilative or cachectic diathesis, a lymphatic or pyogenic tendency, and more or less of emaciation; these being the subjects in which eczema impetiginodes and impetigo eczematosum mostly prevail.

As cod-liver oil has been *tried* internally, so cod-liver oil has been *tried* externally, by way of inunction through the skin; and cod-liver oil has been reported to be an excellent remedy, externally applied in cutaneous disease. There can be no doubt that, used by way of inunction, some portion of the oil is absorbed into the blood, and applied to the purpose of nutrition, becoming, in fact, an internal remedy. But as far as its real external powers are concerned, cod-liver oil possesses no virtues greater than any other oil, or even lard, which brings us back to the use of ointments; the true value of which we shall perceive at once, if we compare the dry, parched, exfoliating, cracked, oozing skin of cutaneous disease, with the moist, pliant, soft, integument saturated with oil or lard.

Besides the more apparent properties of oily matters applied to the skin, their deoxidizing powers are to be borne in mind; and as oxygen is the great stimulant of chemical action generally, and of the chemical processes taking place in the blood of an inflamed part, the value of this power of fencing off the oxygen cannot be estimated too highly. This power I claim for ointments, as applications to eruptions of the skin. The plan of inunction by the skin in measles, scarlet fever, and small-pox, has been successfully pursued in Germany, and I have adopted it in my own practice with great advantage. It not only diminishes the heat and pruritus of the surface, but, by checking the formation of the poison in the capillaries of the skin, reduces materially the general fever. Upon the same principle, carbonic acid gas becomes a valuable remedy in states of inflammatory congestion of the skin, in irritable eruptions and ulcers, and is probably the beneficial agent in that excellent topical application, the yeast poultice. In selecting an oleaginous substance for inunction by the skin, I should prefer fresh lard or fresh neat's-foot oil to the cod-liver oil.

Glycerine, during the last few years, has been largely used as an application for the skin, and was first introduced to the notice of the profession by Mr. Startin. Struck by the peculiar and paradoxical properties of this singular fluid, which up to that time had been regarded as a useless product, and was allowed to flow away into the sewers of the Thames, this curious substance, sweet as syrup, without containing a particle of sugar or fermentable matter, and mixing with water with the utmost ease, although extracted directly from oil, was preserved by Mr. Warrington of the Apothecaries' Hall, under the hope that some day a use might be found for it, whenever it came to be more generally known. Mr. Warrington's expectation was soon realized; he mentioned it to Mr. Startin, and afterwards to me, and it became suddenly called for by the profession, to a greater extent

than could be supplied. It was necessary, therefore, to manufacture glycerine; and that substance which a few months before had been wasted as an effete and useless product, was now manufactured at the sacrifice of the materials out of which it was formed. As it originally existed in the carboys preserved by Mr. Warrington, glycerine was perfectly free from odor; it had been produced by the decomposition of the oil which takes place in the manufacture of lead plaster. Now, having become a valuable and costly medicine, new sources of supply were opened, and among others, that of the soapboiler; and the glycerine derived from this source was so offensive in smell, that for a time I discarded its use, and glycerine fell into the danger of being dismissed altogether from our Pharmacopœia; subsequently, Mr. George Wilson, one of the managing directors of Price's Patent Candle Company, discovered a method of separating glycerine by distillation from the materials used in their manufactures, and has succeeded in producing it perfectly free from smell, of a purer quality than that heretofore in use, and in a quantity which renders its exhaustion at any future period very improbable.

Glycerine is an exceedingly useful therapeutical preparation in all cases where dryness, scaliness, or scurfiness of the cuticle is the predominating feature; for example, in that general dryness of the surface which I have called xeroderma, in pityriasis, and notably in the extreme dryness of the palms of the hands which accompanies psoriasis palmaris. It may be employed either in its pure state, or more or less diluted in the form of a lotion. I have not found it a good remedy in irritable erythemata nor in eczema, and I confine its use exclusively to the cases mentioned.

CHAPTER V.

DISEASES ARISING FROM GENERAL CAUSES.

ERYTHEMATOUS OR EXANTHEMATOUS ERUPTIONS.

THE eruptions belonging to this group, of which erythema, *inflammatory blush*, is taken as the type, are four in number; namely,

Erythema,	Roseola,
Erysipelas,	Urticaria.

These eruptions correspond with the exanthemata of Willan; but Willan included besides, under the same head, scarlatina, rubeola, and purpura, while he omitted erysipelas, considering that in his order Bullæ. I have thought it more consistent with the present state of knowledge to treat of scarlatina and rubeola among the eruptive fevers, as being diseases originating in an animal poison of unknown origin. Purpura I have placed apart, as belonging to a group re-

markable for dyscrasis of the blood and tissues, while the bullæ of erysipelas may be considered as almost an accidental character, being frequently altogether absent.

I have committed violence to Willan's system, in respect of another affection, which I have taken from his order Squamæ, and placed in this group, as a variety, or rather as a form of chronic erythema, namely pityriasis. Pityriasis is evidently an erythema, attended with exfoliation of the epidermis, the exfoliation being furfuraceous, and probably more copious than in the simply congestive forms of this affection. But the latter character cannot be considered sufficient to transfer it to a different order, and to associate with it a specific affection so entirely distinct as lepra. All the natural affinities of Pityriasis sufficiently point it out as an erythema.

ERYTHEMA.

Syn. *Inflammatory blush. Efflorescence cutanée*, Fran.—*Hautröthe*, Germ.—*Dartre erythemoïde*, Alibert.

Erythema[1] (Plate I., G.—K.) is a superficial inflammation of the skin, characterized by a diffused or circumscribed redness occurring in one or several patches of irregular form, and varying from a few lines to several inches in extent. It is non-contagious, occasionally produced by local irritation, but generally symptomatic of constitutional or visceral disturbance. In the commencement of erythema the derma is a little swollen; the swelling, however, speedily subsides, the redness remaining for a much longer time. Upon the dispersion of the redness, the skin retains for some days a purplish and bluish tint, and the epidermis exfoliates in the form of a furfuraceous and laminated desquamation.

There are two degrees of erythema—acute and chronic; acute erythema presenting eight principal varieties—namely,

Erythema	fugax,	Erythema	intertrigo,
"	circinatum,	"	papulatum,
"	marginatum,	"	tuberculatum,
"	læve,	"	nodosum.

These varieties admit of arrangement into three groups—symptomatic, local, and general or idiopathic. The *symptomatic* kinds are erythema fugax, erythema circinatum, and erythema marginatum. The *local* group comprehends erythema læve, a disease depending on the local condition of the limb, and very appropriately designated by Good, erythema œdematosum; and erythema intertrigo, the consequence of local irritation. The *general* or *idiopathic* varieties are erythema papulatum, tuberculatum, and nodosum, which are preceded and accompanied by general febrile symptoms, and are closely allied with each other.

[1] Der. ἐρυθαίνω, to redden.

ERYTHEMA FUGAX.

Erythema fugax appears in the form of diffused patches of redness, which are variable in depth of color and extent, and occur for the most part on the upper regions of the body, as upon the face and neck, the trunk, and the arms. The redness of this form of erythema is especially characterized by its evanescent and fleeting disposition, one while vanishing suddenly, to reappear at successive periods; another while subsiding on one spot, to break forth on several; and again continuing fixed for a short period, to disperse slowly and by degrees. It is attended with considerable heat and dryness of surface, and sometimes by swelling. At its decline, the epidermis is left rough and furfuraceous, from the disturbance to which the formative function of the derma had been subjected.

Erythema fugax is chiefly important as a symptom of visceral derangement, and in some instances it may be regarded as an indication of the long continuance and danger of such disorder. It is particularly noticed in connection with irritation of the mucous tissues of the body, as of the alimentary mucous membrane, the respiratory membrane, the generative membrane, and the urinary mucous membrane. In my notes for the past three years, I find references to cases in which this form of exanthema has appeared in conjunction with dyspepsia, diarrhœa, hepatitis, bronchitis, hysteria, anomalous uterine irritation, pregnancy, inflammation of the kidneys, &c. It is also seen in some nervous affections and fevers; and Willan records a fatal case of puerperal fever in which erythema fugax was a conspicuous symptom. This inflammation is most frequently observed in the female sex.

I had lately under my care a striking instance of this affection in the person of a young military officer, who was not aware of any disturbance of his general health. The efflorescence was attended with swelling, would come on in the course of an hour, and after the continuance of a few hours subside as rapidly as it had appeared. His attention was generally drawn to the seat of the disease by some degree of itching, and on examining the part, the redness and swelling were perceived. Trifling as the disorder appeared, it was a source of serious annoyance; it sometimes made its appearance while he was engaged on military duty, or dressing for a dinner party, fixing, for example, upon the cheek, and closing his eye by tumefaction of the lids.

ERYTHEMA CIRCINATUM.

Erythema circinatum (Plate I., K.) appears in the form of small, round, and very slightly raised patches of redness, which enlarge by their circumference, while the redness in the centre fades and disappears. In this manner, a number of rings with broad margins are produced, which run over the surface of the affected region, and, as they increase, communicate by their borders, and give rise to a number of irregular and broken bands resembling segments of circles of various magnitude. The central portion of the rings, and the surface

which has been left by the erythema, has a yellowish tint, and throws off a furfuraceous desquamation. The duration of erythema circinatum is greatly dependent on the nature of the disease with which it is associated; it may be stated generally at from a few days to two or three weeks.

I have before me the notes of a case of this form of erythema, associated with acute rheumatism, which occurred in the hospital practice of Dr. Watson. The spots were first developed on the abdomen, and quickly spread from this point as from a centre, until they had occupied with their curves the whole surface of the trunk of the body and limbs. The case in other respects presented no characters different from ordinary rheumatism; the symptoms of the latter were neither aggravated nor relieved by its invasion, and it appeared to be developed in connection with augmented perspiration.

ERYTHEMA MARGINATUM.

Erythema marginatum is an aggravated form of erythema circinatum, occurring, for the most part, in association with chronic visceral disorder, and in elderly persons. In this variety there is a greater degree of congestion of the skin than in the preceding; there is a deeper but variable tint of redness, which frequently approaches to a purplish hue; the border of the circles is more raised, and slightly papular, and the margin is abrupt and well defined. Like erythema circinatum, the present variety presents considerable difference of appearance at different stages of its progress; at one time exhibiting a distinctly annular form, at another, an assemblage of raised and inflamed bands, having more or less of a curved direction. This diversity of appearance of the disease at different stages of its progress enables us to comprehend the apparent dissimilarity in the definition of erythema marginatum, as given by Willan and Bateman, and by Rayer. The latter of these authors describes the early stage of the exanthem, when he remarks that it consists of "circular patches of a livid red, from half an inch to an inch in diameter, the circumference of which is distinctly separated from the healthy skin, raised, prominent, and slightly papular;" while Willan and Bateman, taking the latter stages as their type, describe the marginal ridge as existing only on one side of the patch, the redness diffusing itself gradually in the rest of its circumference. The eruption may occur upon all parts of the body, but is most frequently seen on the trunk, particularly in the loins, and on the outer sides of the limbs. Its duration depends on the nature of the disease which it accompanies; it generally extends to several weeks.

ERYTHEMA LÆVE.

Erythema œdematosum.

Erythema læve is an inflammation of the skin associated with œdema, and appearing for the most part in the lower extremities. When, however, the vital powers of the system are reduced, it may

be developed in any dependent part of the body. In the lower limbs it commences around the ankles by several small spots, which, by their increase, speedily form a patch of considerable extent. The inflamed surface is smooth, shining, and of a bright red color; it is more or less swollen from distension of the subcutaneous cellular tissue with serous fluid, and is attended with itching, and by a painful sensation of tension. When left to itself, œdematous erythema may continue without change for several weeks, and may terminate eventually in ulceration or mortification. When it issues in resolution, the swelling subsides, although the œdema may still remain for some time longer; the brighter hue of redness merges into a purplish and livid tint, and the skin is long before it regains its natural appearance. Moreover, the epidermis desquamates in thin lamellæ.

There is a form of erythema læve which is very common in persons beyond middle life, and which affects the legs, extending from the instep and ankle to the hollow below the knee. The legs are more or less swollen, they pit on pressure, the œdema being greatest around their lower part; they are hot, painful, itchy, particularly in the evening and in bed, and they are more or less reddened by a patchy and irregular redness. In this particular, also, there is a good deal of variety; sometimes the redness is general and vivid, and at other times hardly discernible. In either case, if the skin be closely examined, it will be found to have the appearance of being cracked all over, which is really the fact. From the distension which has taken place, the cuticle has given way, and the derma, corresponding with the lines of rupture, looks red and angry, and forms a network of rough, more or less raised lines over the affected skin. The small islets of unbroken skin between the lines are more or less smooth, but sometimes roughened by exfoliation of the cuticle from their surface. Their edges, corresponding with the line of ruptured cuticle, are also rough, and in some instances their appearance is such as to suggest a comparison with the scaly integument of a serpent.

Not unfrequently, there is an oozing of an ichorous fluid from the inflamed lines; in which case the secretion dries, and forms a thin crust, and the eruption might be mistaken for eczema. At other times the inflamed lines have a papular character, and the case might be considered to be one of lichen. This form of erythema læve is often troublesome and tedious, equally annoying to the patient and to his physician.

In young persons, erythema læve is an occasional result of sedentary habits, or of fatiguing exertion in close apartments. Those of the lymphatic temperament are most liable to its attack, and it is not unfrequently observed in chlorosis. In adults it sometimes appears without any more obvious cause than disorder of the digestive system, particularly in persons of intemperate habits. In persons of advanced life the affection is by no means uncommon, and occurs as a consequence of over-exertion in standing or walking. It is also a frequent complication of the œdema which accompanies varicose veins and anasarca. The local affection is usually accompanied by slight febrile symptoms, and by some degree of constitutional disorder.

Besides the erythema œdematosum now described, which results from a pre-existing œdema, and is found in a dependent part of the body, an œdematous erythema is sometimes met with around the eyes. This form of eruption commonly occurs in persons beyond the mid-period of life, and more frequently in women than in men: the œdema is not, as in the former case, the predisposing cause of the inflammatory congestion, but a consequence of that action operating on a tissue prone to serous infiltration. Not unfrequently it is met with in association with eczema existing in other parts of the body, or it occurs in persons who have previously suffered from eczema, and may itself be regarded as a stage of the latter disease. Moreover, it is apt to be taken for erysipelas, and, as far as external appearances are concerned, it closely resembles that affection, differing from it only in the lesser degree of constitutional disturbance. Under these circumstances, erythema œdematosum is often considered and treated as an erysipelas, and is constantly spoken of by those who have suffered from its attack as being that disease.

ERYTHEMA INTERTRIGO.

Erythema intertrigo[1] is that form of cutaneous inflammation which is induced by chafing the skin, either by the friction of one surface of the integument against another, by the friction or pressure of dress, by the irritation of secretions and discharges flowing over the surface, or by the presence of any cause of irritation whatever, as over-distension of the skin, eruptive affections, &c. This inflammation is attended with little or no swelling; but when it occupies the folds of the skin, whence the perspiratory fluid does not easily escape, or is produced by contact of secretions, the abraded derma pours out a sero-purulent ichor, which excites a troublesome itching. If the cause of irritation continue for some time the skin becomes excoriated, and deeply chapped. The cutaneous inflammation produced by pressure on the skin, as in bed-sores, is termed *erythema paratrimma*.

Erythema intertrigo, from the friction of adjoining surfaces, is met with between the folds of the skin of infants, as between the buttocks, between the thighs, around the umbilicus, and in the groins, particularly if the parts be moistened by secretions, or unprotected by cleanliness; in the folds of the skin of fat persons, especially in warm weather; upon the face, from the overflow of tears, the saliva, or the secretion of the nose; upon the vulva, the prepuce, and the scrotum, around the anus, and between the toes. When the disease occurs around the anus, it gives rise to pain during the action of the bowels, and frequently to spasm of the sphincter. In a case for which I was lately consulted, where the disease affected the prepuce, the aperture of this part was so much contracted and hardened by the cicatrices following upon chaps, that not only had phymosis resulted, but the urethra was also obstructed.

[1] *Intertrigo*, a chafe-gall, a fret.

ERYTHEMA PAPULATUM.

Erythema papulatum (Plate I., G.) is characterized by the development of numerous small red spots, of which the largest scarcely exceed the disk of a split pea. They are accompanied by considerable itching and tingling of the skin, which is increased after meals and during the night. On their first eruption the spots are of a bright red color, and slightly raised above the surface of the surrounding skin. The swelling, however, subsides in the course of a few days, but the redness continues for one or two weeks, becoming purplish in its tint, and yellowish as it fades away. In distribution the spots are irregular, being in some situations aggregated into thickly-set patches, while in others they are scattered and dispersed. This variety of erythema occurs most frequently on the face and neck, chest, arms, backs of the hands and fingers. It is met with at all periods of life, particularly in young persons and females, is preceded by febrile symptoms, and is usually associated with irritation of the gastro-pulmonary mucous membrane, and sometimes with rheumatism.

ERYTHEMA TUBEROSUM.

Erythema tuberosum (Plate I., H.) consists of an eruption of patches of a circular form, and of a size varying between a four-penny-piece and a shilling. They are frequently interspersed among the smaller spots of erythema papulatum, on the upper parts of the body; but upon the legs, where the eruption is most frequent, they occur without admixture. Like erythema papulatum, the spots are preceded by itching and tingling; they appear generally at night, are brightly red and very tender at their first outbreak, become purplish in the course of two or three days, and assume the yellow and greenish tint of a bruise as they subside. The eruption is frequently ushered in with chills and feverish symptoms, and is accompanied in its course by debility, languor, and considerable constitutional disturbance. This form of erythema is frequently met with in female servants, particularly in those who have been recently transferred from the fresh air of the country to the confinement of London kitchens. It is seen also in persons of debilitated constitution, and, according to Dr. Corfe, is generally associated with disordered menstrual function.

ERYTHEMA NODOSUM.

Erythema nodosum (Plate I., I) is an inflammation of the skin occurring in oval patches, which vary in size, from half an inch to two or three inches in diameter, and are situated for the most part on the upper and lower extremities. The long diameter of the patch usually corresponds with that of the limb, but in several instances I have seen it occupy the opposite position, and two patches, one before and one behind, meeting by their extremities, have surrounded the leg as with a bracelet. The oval patches are slightly raised above the surrounding surface, the elevation increasing gradually towards the centre;

they are hot, painful, and tender; of a bright red color at their eruption, but change in the course of a few days to a purplish and livid tint, which becomes subsequently yellow and greenish, and has the appearance of an ordinary bruise. The inflammatory activity of the patches increases for several days, during which they are hard and painful; they then become softer to the touch, and by the eighth or tenth day have nearly subsided; terminating by a transient discoloration of the skin, and desquamation of the epidermis. Erythema nodosum is preceded by symptoms of general feverishness, such as headache, languor, chills, dry skin, quick pulse, white tongue, nausea, diminished secretions, &c., and disturbance of the digestive organs; these symptoms diminishing on the appearance of the eruption. It has also been observed in connection with rheumatism; it attacks chiefly young persons and females, and those of a debilitated habit of body.

Erythema papulatum, tuberosum, and nodosum, are so closely allied to each other, that they might with advantage be included under the same name. The two former are commonly associated in the same patient, and I have more than once seen erythema papulatum on the face and hands, while erythema nodosum existed on the legs.

ERYTHEMA CHRONICUM.

The term *chronic* has reference to two states of erythema, namely, that in which the erythematous blush is from the beginning slow in its progress, subsequently stationary, and does not affect the integrity of the skin; and that which represents the advanced stage of an acute erythema, wherein the erythema, instead of terminating by resolution, becomes, as it were, permanently established in the skin, assumes new characters, and persists for an indefinite length of time.

Of the former kind, namely, *slow in progress, and subsequently stationary*, are the red patches called *fiery spots*, that are frequently seen upon the face; which vary in brightness with the health of the patient, and are especially vivid after meals.

Of the latter kind, namely, those which represent a *persistent stage* of erythema, are patches of erythema commonly found among the folds of the skin, in the flexures of joints, behind the ears, upon and around the lips, around the nipples, in the perinæum, in the groins, around the various apertures of the body, and upon the scalp. In this form of erythema, there is besides the redness of the skin, more or less thickening of the derma, more or less exfoliation of the epidermis, and sometimes cracks and chaps of the skin. This form of erythema is very commonly met with as a sequel of chronic lichen and chronic eczema; a chronic lichen, in fact, wherein the papulæ have subsided, or a chronic eczema in which the ichorous secretion has ceased to be formed, the redness, the thickening of the skin, and more or less of exfoliation of the epidermis remaining; in a word, the pathological state of the skin to which the term *psoriasis* has been applied, and to which it should be strictly limited.

Psoriasis, therefore, is nothing more than a chronic erythema; and

as this form of erythema is more frequently a sequela of lichen and eczema, most commonly of the latter, than of common erythema, I have made its description follow that of chronic eczema.

Another form of chronic eczema, sometimes appertaining to the first, and sometimes to the second class, but more properly belonging to the former, remains, however, to be described. It is characterized by an erythematous blush of the skin, circumscribed, of a more or less circular figure, and covered by a furfuraceous, or more frequently by a mealy desquamation of the epidermis. This is the eruption which has been denominated *pityriasis*. In the dermatographic classification of cutaneous diseases, pityriasis is associated with psoriasis, and both are described in companionship with lepra, simply from the circumstance of presenting a surface coated with minute scales. Psoriasis, moreover, is confounded with lepra; but these diseases have nothing in common with lepra, further than some slight similarity of appearance.

ERYTHEMA PITYRIASIS.

Syn. *Lepidosis pityriasis;* Mason Good. *Dartre furfuracée;* Alibert.—*Schuppen*, Germ. *Dandruff. Branny tetter.*

Erythema pityriasis[1] (Plate XII., L.) is a chronic inflammation of the skin, which is characterized by the production of minute white scales in great abundance, on patches of irregular form, and variable dimensions. The patches are of a dull red or pinkish color, but sometimes so light as scarcely to be distinguishable from the surrounding skin. They are developed on any part of the body, frequently in succession, and are attended with heat, and some degree of pruritus and tingling. The scales are thrown off as soon as formed, and are reproduced with great rapidity; they are for the most part small and micaceous; in certain situations, however, where the integument is thick, they are larger and furfuraceous, and in those parts where the integument is thin, as in the flexures of joints, are pulverulent and mealy. Pityriasis, from its chronic nature, is a disease of long continuance, but is not contagious.

The varieties presented by pityriasis are distinguishable into general and local; of the former, Willan enumerated three, and of the latter, one. The general varieties of Willan are, pityriasis rubra, pityriasis versicolor, and pityriasis nigra; the first of these alone deserves to be considered as an erythema; the other two are chiefly remarkable for their alteration of color, and are consequently referable to the chromatogenous disorders. The local variety indicated by Willan is pityriasis capitis; to which Rayer has added pityriasis palpebrarum, labiorum, palmaris et plantaris, præputialis, pudendalis, and pityriasis oris. The whole of these so-called varieties of pityriasis are clearly nothing more than chronic erythema, verging more or less on psoriasis.

[1] Der. πίτυρον, furfur, bran, from the bran-like desquamation by which it is attended.

PITYRIASIS VULGARIS.

Syn. *Pityriasis rubra*, Willan.

Pityriasis vulgaris (Plate XII., F.) occurs indiscriminately upon any part of the body, but particularly in the flexures of the skin, and on those regions which are exposed to the influence of the air, as the face, neck, and hands. It is distinguished by the eruption of red superficial patches, upon which the scales are produced, at first in small number, so as to give rise to some degree of roughness only, but subsequently in large quantities. This affection is very commonly met with in children and persons possessing a delicate skin and fair complexion, upon the sides of the chin, around the mouth, and on the forehead. When of considerable extent, pityriasis is attended with itching and tingling, more particularly at bedtime, and during the night. By successive eruption on different parts of the body, the disease may gradually extend over the entire cutaneous surface, disappearing in some parts, while it breaks forth in others. In this manner it is frequently prolonged for months, and is very obstinate; the subcutaneous cellular tissue sometimes becomes thickened and infiltrated; and if the surface be abraded by scratching, an ichorous fluid is poured out (eczema), which desiccates into thin scabs, and complicates the diagnosis of the disease. After the decline of pityriasis, the skin presents for some time a yellowish stain. When the disease is general, or a large surface of the body is implicated, the eruption is accompanied with languor and slight constitutional disturbance.

PITYRIASIS CAPITIS.

Syn. *Dandruff.*

Pityriasis capitis appears upon the head chiefly in children and old persons, commencing usually upon the temples, and around the forehead, and thence extending to the rest of the scalp. It is a troublesome affection, attended with much itching, and, at its first invasion, with some degree of redness, which gradually disappears, and leaves the integument whiter than its natural hue. Occasionally it extends to the eyebrows, the whiskers, and the beard. Pityriasis may continue for months, and even for years, particularly in old persons, but is perfectly amenable to treatment.

Diagnosis.—The diagnostic characters of erythema are, redness and heat of skin with but trifling swelling, the redness passing by degrees into a purple and livid tint, as the inflammatory excitement subsides. The absence of tumefaction, and distension of the subcutaneous cellular tissue, at once distinguish erythema from erysipelas.[1]

Erythema fugax (E. volaticum genarum) is distinguished from the other varieties principally by negative characters, namely, by the

[1] Plenck's definition of erythema is as follows: "Macula rubra, solitaria, apyreta, et topica."

absence of those peculiarities which mark the rest. The redness is diffused, there is little swelling, the surface is dry and hot, and the inflammation evanescent.

Erythema circinatum is remarkable for the annular form of its patches; it is distinguished from herpes circinatus by the absence of vesicles, and from lepra in progress of cure by its general appearance, and by the previous history of the affection.

Erythema marginatum is recognized at an early stage by the annular form of the patches, and, at a later period, by its abrupt and papulated border.

Erythema læve is characterized by its association with œdema of the subcutaneous cellular tissue.

Erythema intertrigo is distinguished from eczema by the absence of vesicles. The cause of intertrigo, again, is immediately obvious (E. ab applicatis acribus; E. a decubitu; E. ab attritu; rubedo clunium in equitantibus).

Erythema papulatum may be confounded with some forms of roseola, from which it differs but little, and particularly with urticaria; but the latter is more irregular and unsteady in its progress, and the itching is more pungent.

Erythema tuberculatum is distinguished by the circular red patches developed on the skin, and by the constitutional symptoms.

Erythema nodosum is so clearly characterized, as to offer little room for confounding it with any other eruption. Roseola is that which approaches it most nearly. Erythema nodosum is distinguished from other cutaneous affections by the oval form of the patches, and by their general erythematous characters. It differs from roseola in the greater depth of its inflammation.

Erythema chronicum may be known by its general characters; the furfuraceous and mealy desquamation determining the forms which belong to pityriasis, and the remains of papulæ, or some degree of ichorous discharge, the sequelæ of chronic lichen or chronic eczema.

Causes.—The proximate cause of erythema is congestion of the vascular rete of the derma, induced by local or by general causes. The varieties coming under each of these heads have been already specified. Erythema may also be induced by disorder of the digestive organs, from the use of improper food, or from taking irritating matters into the stomach, as copaiba. The peculiarities of color observed in the disease under consideration are explained by reference to the general principles of inflammation. During the period of excitement the blood is of a bright red color; it courses rapidly through the part, and the vessels become dilated. After the subsidence of the excitation, the stream of blood flows languidly through the dilated vessels, and assumes the venous character in its course. Hence the bright red tint of the early periods of erythema, and its purplish and livid hue during the subsequent stages.

The exciting causes of erythema læve are, retarded venous circulation through the limb, and interference with the vascular distribution in the skin by œdematous distension of the subcutaneous cellular tissue, while its predisposing cause is very commonly, gout.

PROGNOSIS.—Erythema is for the most part a slight affection, and derives its chief importance from the disease with which it may chance to be associated, or from the nature of its cause. The duration of the acute varieties rarely extends to more than two or three weeks. Chronic erythema speedily yields when the exciting cause is removed, and erythema læve, the most serious of the erythematous inflammations when it occurs in old persons, is easily controlled by judicious treatment.

TREATMENT.—The principles of treatment of erythema resolve themselves into three indications: 1. To restore the altered functions of the system to healthy action. 2. To allay the local irritation. 3. To excite the nerves of the part to resume their normal tone, and the congested vessels their normal dimensions and functions.

The symptomatic varieties of erythema require to be treated through the disease upon which they are dependent. The method of treatment must consequently vary in relation to circumstances. In some instances, the antiphlogistic plan may be required, in others, the irritation of mucous tissues must be soothed, while in others, again, it may be necessary to excite counter-irritation at a distant part. With the latter view, aloes combined with myrrh will be found a useful remedy, particularly in females.

When the system is reduced, and the powers are enfeebled, tonic remedies are indicated; bitters combined with acids are of great service, together with an appropriate regimen and the judicious use of exercise; after a course of these remedies, Fowler's solution may be commenced, in doses of three or four minims three times a day, either directly after or with meals. In chronic erythema arsenic is especially indicated.

Sponging the entire surface of the body with tepid water and soap every day, or every other day, with occasional tepid baths, and drying the skin thoroughly with a towel, will also be found useful. To this means may frequently be added, with great advantage, the friction on the unaffected skin of some stimulant spirit or liniment, such as a drachm of tincture of croton,[1] combined with one ounce of spirit of rosemary and three of rose-water; or two drachms of liquor ammoniæ fortior to aqua calcis and oleum olivæ optatum, two ounces each.

The local treatment should, according to circumstances, consist in evaporating lotions, water-dressing, or warm fomentations. In the erythema fugax of the face and neck, the benzoated zinc ointment with spirits of wine will be found a grateful application.

For erythema læve, the general treatment must consist in the restoration of the secretions, in establishing the regularity of the digestive organs, and in the subsequent exhibition of tonics, with attention to diet. Where gout is suspected to be the cause of the disease, a warm antacid purgative, such as Gregory's powder, or a powder composed of rhubarb, soda, and calumba, with or without colchicum

[1] The tincture of croton, a most valuable cutaneous stimulant, is made by adding four ounces of spirit of wine to one ounce of the bruised seeds of croton. It is ready for use at the end of a week.

or iodide of potassium, should be given twice or three times a day, and the juice of two or three lemons as a cooling drink. The local treatment demands rest, such a position of the limb as will assist the venous circulation as much as possible; evaporating lotions or warm fomentations in the acute stage, succeeded, as soon as the inflammation has somewhat subsided, by inunction with the ceratum plumbi, or the oxide of zinc ointment, either alone or in combination with the liquor plumbi diacetatis, or spirits of wine, and by the application of a well-adjusted cotton bandage. Gentle frictions with camphorated spirit may be employed when the local excitement is reduced, and repeated night and morning at each application of a fresh bandage. The erythema accompanying anasarca is immediately relieved by position.

The excoriations of erythema intertrigo require to be kept perfectly clean, and free from the original cause of irritation. They should then be dusted with some absorbent powder, such as Fuller's earth, starch powder, oxide of zinc, &c., or anointed with the oxide of zinc ointment. Erythema paratrimma is best treated by the oxide of zinc ointment, or by soap plaster spread upon wash-leather. In erythema a decubitu, or bed-sore, the inflamed skin should be painted with a liniment of white of egg and spirit of wine, and afterwards covered with soap plaster spread on amadou.

Erythema papulatum, tuberosum, and nodosum, require antiphlogistic regimen, a brisk purgative of calomel and colocynth at the commencement, then tonics and the mineral acids.

Chronic erythemata are to be managed according to the general principles of treatment above detailed; the excitement of the affected part is to be reduced in the first instance by soothing applications, and then astringents and gentle stimulants are to be used. The *chapping of the hands* may be prevented and relieved by the use of a small quantity of honey, which should be rubbed into the inflamed part each time the hands have been washed, and then wiped off, so as to remove any stickiness that may remain. Glycerine may be applied in the same way, or an ointment of oxide of zinc may be found useful for the same purpose.

Erythema or pityriasis capitis, invariably yields to an application composed of one part of the red precipitate ointment to three of lard; or to the white precipitate ointment diluted in the same proportion.

Erythema of the nipples (chapped nipples) is best relieved by the application of the oxide of zinc ointment made into a cream with spirits of wine or spirits of camphor, an ointment of nitrate of silver, containing from five to ten grains to the ounce; the tinctures of kino and catechu; infusion of oak bark or pomegranate; or lotion of chloride of lime. Other useful applications for chapped nipples are —a powder consisting of equal parts of borax and powder of acacia, which should be dusted frequently upon the cracks and excoriated surface; and mucilage of gum acacia. The latter should be pencilled on the tender part immediately after suckling, and the nipple protected with a leaden shield or limpet shell. I have also seen great benefit result from the use of collodion, which, judiciously applied, and

assisted by other means, will be found a valuable remedy. Collodion is a good defensive agent for protecting the tender skin from the effects of pressure and moisture.

It is judicious, in most cases, to wean the infant when the nipples are tender and chapped; but when weaning is objected to or inconvenient, a shield and teat should be applied, without interfering with the zinc or nitrate of silver ointment.

For erythema of the vulva and anus, the most soothing applications are, the superacetate of lead ointment, or the oxide of zinc ointment with liquor plumbi diacetatis. Over these an evaporating lotion may be used, if requisite; and when the acute stage is passed, the milder ointments may be replaced by the nitrate of mercury ointment, more or less diluted, as the feelings of the patient may permit. The nitrate of silver ointment and juniper tar ointment are also found to be of service in some instances.

Cases Illustrative of Erythema.

Erythema papulatum.—A married lady, habitually dyspeptic, became overheated on the 16th of December, 1845; she was afterwards chilled by exposure to cold in an open carriage for some hours. At night she was feverish and restless.

Dec. 17. Next day she felt unwell, with general *malaise* and lassitude, was exposed to cold as before. In the afternoon had nausea and chills. At dinner she partook of boiled beef, at all times an unpalatable dish to her, and suffered in the evening from nausea and headache. In the night she was awakened with intense nausea, but had no vomiting.

18th. Third day. Felt very unwell, nausea still continuing with lassitude. A punctiform rash became perceptible on the backs of her hands and fingers; the rash was more vivid at night, and attended with considerable itching.

19th. Eruption increasing; affecting the elbows as well as the hands, and slightly the neck and face.

22d. Seventh day. Eruption at its height. On the elbows, the papulæ formed a patch of about the size of the palm of the hand; they were numerous on the fingers and backs of the hands, and few and scattered on the face, neck, and head. The greater number of the papulæ were hemispheroidal, slightly raised, of a vivid red color, and equal in size to a split pea. Some were clustered into circular and oval groups of the size of a sixpence, and others were single and isolated. On the backs of the hands were spots of a larger size than those above mentioned, as large in diameter as a sixpence or shilling (erythema tuberosum); they increased in breadth by their border, which was prominent and papular, while the included area became pale and yellowish. The eruption was very tender to the touch.

23d. Eighth day. The symptoms of nausea and feverishness, which were slightly diminished on the appearance of the eruption, were now greatly relieved. The eruption was on the decline; the tenderness subsided; the redness diminished; and each little papula, as it

gradually disappeared, formed a distinct ring of red, with a light yellowish area. Traces of the eruption lasted until the end of the second week.

Erythema papulatum et nodosum.—A widow, forty-five years of age, regular, had been suffering four months with bronchitis. On the 1st of April, 1846, she had an eruption on the face, and then on the hands, of papulæ of a bright red color, and accompanied by severe itching and tingling. These symptoms were increased on taking fluids of any kind, particularly such as were warm, and they were greatly augmented by the warmth of bed. The papulæ were very tender to the touch, particularly around the finger nails. A few days after the disappearance of the eruption on the face, the large, oval-shaped swelling (delineated in Plate VII.) made its appearance, attained its height on the second day, and declined on the fourth, leaving behind it a purplish and yellow stain, like that of a bruise. The constitutional symptoms preceding and accompanying this eruption were nausea, feverishness, and extreme lassitude. The languor, with great depression of spirits, continued until the termination of the disease.

Erythema tuberosum.—A young woman, aged twenty-two, enjoyed good health until nine months ago, when she obtained service in London as housemaid. Since that period she has suffered constant illness; sometimes her bowels were constipated, sometimes she had nausea, at other times cough; menstruation was disturbed, becoming scanty and light-colored; she had leucorrhœa, and copious deposits in her urine, with difficulty in passing it. In fact, all the mucous membranes in her body suffered more or less from disorder. Associated with these symptoms, she had a constant feeling of languor, loss of appetite, and indisposition to make any exertion. While in this state she was seized (January, 1846) with a dry, hard cough, accompanied with headache and the usual train of febrile symptoms; and a copious eruption of erythema tuberosum made its appearance on her forearms, knees, and legs. The majority of the spots were of the size of a shilling piece, they were distributed regularly over the skin, and were very tender to the touch. On their first appearance they were vividly red, but soon became purplish and yellowish, and by the third or fourth day, were on the decline. This patient recovered at the end of three weeks; her treatment consisting in a smart purgative at first, followed by tonics and wine, and an occasional warm bath during her illness. Water-dressing was used to the eruption.

Erythema lœve of the ankle.—A cook, forty years of age, after a week of unusual exertion, felt languid and ill, and was unable to walk, in consequence of pain and swelling in her right leg. Her pulse was quick, she had a dry, furred tongue, and headache. The affected leg was œdematous, particularly around the ankle. In the latter situation there was a broad and extensive patch of erythema lœve. The veins of both limbs were varicose, but she had never before suffered from any affection of the legs. I ordered her to bed, gave her an active purgative with salines, had the leg supported on an inclined plane, the inflamed parts wetted with a layer of lint dipped in a saturnine and

alcoholic lotion, and the whole of the lower leg enveloped in oiled silk. By the next morning the redness had diminished very considerably, and the œdema was much reduced. I then moistened the limb with camphorated spirit, and bandaged it firmly, from the foot upwards, to the lower part of the thigh, readjusting the bandage night and morning. From the first day of the application of the bandage she was enabled to walk, but in consequence of again over-exerting herself, and misapplying the bandage, which, after the first few days, I intrusted to herself, it was found necessary to confine her again to bed, where in a short time she recovered.

Severe erythema læve of both legs.—In the autumn of 1841 I was called, with my friend, Mr. Coulson, to see a lady of advanced age, affected with this disease. She was corpulent, of sedentary habits, had long suffered from œdema, and her present attack had lasted for several weeks, resisting the various modes of treatment which had been pursued. The skin of the entire surface of both legs was of a deep red tint, highly congested, and covered with a rough and exfoliating epidermis. Her tongue was foul, and her general health very much disturbed, so much so, indeed, that she was apprehensive for her life. For the purpose of relieving the congested state of the skin, we recommended free scarification with the point of a lancet, to be followed by fomentation and bandaging. To this, however, she objected. We then ordered strict attention to position, painting the surface with the tincture of iodine, and carefully adjusted compression by means of strips of soap plaster spread upon leather; the local treatment being assisted by an occasional aperient and tonics. In the course of a few weeks she had entirely recovered.

Erythema læve, issuing in mortification and death.—An aged woman complained of great pain and uneasiness in the left foot and ankle. There was a diffused patch of redness, with slight œdema, occupying the front of the ankle and the dorsum of the foot. Her tongue was not much altered, but her pulse was quick. I directed her to remain in bed, and to apply fomentations to the limb, at the same time recommending her to the attention of a neighboring medical friend. In a few days the part became discolored, and sphacelus commenced, which extended rapidly up the limb as far as the groin. After death the whole of the arteries of the limb were found to be solidified by calcareous depositions, and some of the smaller vessels were completely obstructed.

ERYSIPELAS.

Syn. *Erythema Erysipelatosum;* Mason Good. *Rosa. Ignis Sacer. Ignis Sancti Anthonii. Erysipele,* Fran. *Rotheauf,* Germ.

Erysipelas[1] is a diffused inflammation of the skin and subcutaneous cellular tissue, affecting a part of the surface of the body, and accompanied by fever. The local inflammation has a special disposition to spread; it is attended with swelling, a pungent, burning, and tingling heat, and by a redness which disappears under pressure with the

[1] Dér. ἐρεύθος, rubor.

finger, to return so soon as the pressure is remitted. It is often accompanied by vesications containing a limpid amber-colored serum, which quickly burst, and form thin, dark-colored crusts. Erysipelas terminates generally in resolution with desquamation of the epidermis, sometimes in delitescence, or suppuration, and more rarely in mortification.

Erysipelas admits of division into two principal varieties, erysipelas simplex, and erysipelas phlegmonodes. The former of these possesses several sub-varieties, and some local forms deserving of attention from the modifications which they present, these modifications being a consequence of the peculiarities of the region in which they are developed. Erysipelas phlegmonodes offers but one sub-variety of importance. The varieties and sub-varieties of erysipelas may be thus arranged:

ERYSIPELAS SIMPLEX.

Sub-varieties.	*Local sub-varieties.*
Erysipelas erraticum,	Erysipelas faciei,
" metastaticum,	" capitis,
" miliare,	" mammæ,
" phlyctenodes,	" umbilicale.
" œdematodes.	

ERYSIPELAS PHLEGMONODES.

Sub-variety.

Erysipelas gangrenosum.

ERYSIPELAS SIMPLEX.

Syn. *Febris Erysipelatosa;* Sydenham.

The inflammation of erysipelas always extends more or less deeply into the tegumentary textures. That which affects the skin the most superficially, is the form at present under consideration, which would seem to be limited to the derma and its immediately contiguous cellular tissue. Simple erysipelas occurs most frequently upon the face and head, next in frequency upon the limbs, and most rarely on the trunk of the body. Like other cutaneous diseases, it offers for inquiry, in the first place, its general or constitutional, and, in the second, its local symptoms.

The *constitutional symptoms* of idiopathic erysipelas are,—chilliness and rigors, succeeded by flushes of heat; dejection of spirits, lassitude, pains in the back and limbs, pains in the head, drowsiness; quick and hard pulse; thirst, loss of appetite, white and coated tongue, bitterness of mouth, nausea, vomiting, pain at the epigastrium, and constipation. These, or some of these symptoms, and in greater or less degree, precede the local disorder for several days, increasing with the progress of the efflorescence, and disappearing at its decline. During the height of the local inflammation the affection of the nervous system often becomes exceedingly severe; there is low, muttering delirium, with subsultus tendinum, an exceedingly rapid pulse, and a brown and dry tongue. At the close of the fever there is

commonly a critical relaxation of the bowels, a sediment in the urine, and occasionally a slight hemorrhage from some part of the gastro-pulmonary mucous membrane, or from the uterus.

Simon observes, that in the early stage of erysipelas the urine puts on the inflammatory character. "It is frequently," Schönlein remarks, "loaded with bile-pigment, and is of a reddish-brown or red color. At the urinary crisis, fawn-colored precipitates are deposited, and the urine becomes clear." Becquerel made two quantitative analyses of the urine of a man, thirty-nine years of age, who had erysipelas of the face and a good deal of fever, his pulse being 112. The urine of the first analysis was of a deep yellowish red color, and clear; its specific gravity was 1.021. That of the second was so deeply colored as to appear almost black; it threw down a reddish sediment of uric acid, and had a specific gravity of 1.023. The first analysis was made on the fourth, and the second on the sixth day of the fever. The analyses are as follows: Becquerel's analysis of healthy urine being placed for comparison in a third column:

	Anal. 1.		Anal. 2.		Health.
Ounces of urine in 24 hours,	27.0	...	30 8	—	45.0
Water,	965.5	...	961.9	—	972.0
Solid constituents,	34.5	...	38.1	—	28.0
Urea,	12.5	...	12.7	—	12.1
Uric acid,	1.2	...	1.3	—	0.4
Fixed salts,	—	...	8.2	—	6.9
Extractive matter,	—	...	15.9	—	8.6
Specific gravity,	1021.0	—	1023.1	—	1017.0

"In a woman, aged forty-five years, with erysipelas of the face, whose pulse was 104 and full, the urine was very scanty, of a dark brown color, strongly acid, threw down a yellow sediment spontaneously, and had a specific gravity of 1023.1. It contained—

Water,	961.7
Solid constituents,	38.3
Urea,	11.7
Uric acid,	1 3
Fixed salts,	9.2
Extractive matters,	15.7

"In five cases in which the morning urine was daily examined with care, the characters of inflammation were present in a very high degree; the specific gravity varied from 1021 to 1025. In four of these cases the urine threw down a reddish sediment, and in two a little albumen was occasionally present."[1]

The *local* affection makes its appearance on the second or third day from the commencement of the febrile symptoms, and is frequently accompanied by soreness of throat and congestion of the fauces. On the skin it appears as a somewhat swollen and irregularly circumscribed yellowish red patch, which is accompanied by a painful sensation of tension, and by a sharp, burning, and tingling, or prick-

[1] Simon's Animal Chemistry, vol. ii. p. 278.

ling heat. On the third and fourth days the redness becomes more vivid, the tumefaction greater, and the painful sensations more acute. These symptoms continue without change until the sixth or seventh day, when they begin to decline. The redness then subsides, fading into a pale yellowish tint; the swelling diminishes, the epidermis is thrown into wrinkles, is dry and friable, and speedily desquamates in thin transparent scales. The resolution of erysipelas is the most favorable termination of the disease.

Sub-varieties.

Erysipelas erraticum.—Erysipelas is remarkably and characteristically disposed to wander from the spot where it was first developed, to extend itself more diffusely, and to fix upon new situations. Sometimes we find it simply spreading, and thus increasing in extent the inflamed surface; at other times it subsides entirely on the parts first affected, as it proceeds in its erratic course, or it suddenly quits its original situation to appear as suddenly on one more distant. This erratic or ambulant disposition of erysipelas is often seen upon the face and head, where it is exceedingly intractable.

Erysipelas metastaticum.—This designation indicates a variety of erysipelas in which the efflorescence suddenly disappears on the surface of the body, and some internal organ becomes immediately and severely affected. The metastatic form of the disease occurs most commonly in debilitated and broken constitutions, and is particularly observable with regard to erysipelas of the head and face. The organs most liable to suffer from the metastatic action in erysipelas are the brain or its membranes, and the gastro-pulmonary mucous membrane. Metastasis to the membranes of the brain is accompanied by delirium and coma, and usually terminates fatally. Dr. Watson remarks that the metastasis of erysipelas is rare. "I do not recollect to have seen it. But the extension of the inflammation, the supervention of delirium and coma, while the external inflammation continues, is of common occurrence."

Erysipelas miliare.—It occasionally happens that a crop of small vesicles (*Erythema vesiculare*, Mason Good), like those of eczema, make their appearance on the inflamed surface. They contain a limpid, serous fluid, burst in the course of a day or two from their eruption, and leave behind them small, brownish-colored scabs.

Erysipelas phlyctenodes is a common form of the disease; it is that in which vesicles (*Bullæ*, *Erysipelas bullosum*) of considerable size, and irregular in their form, appear upon the inflamed skin. They usually arise on the fourth or fifth day, burst in the course of twenty-four hours from their development, and terminate by forming yellowish scabs, which gradually become brown, and afterwards black. The bullæ contain a limpid serum, at first colorless, but changing by degrees to a pale straw or amber tint. Occasionally the fluid becomes opaque, and sometimes assumes a purplish hue; the latter is an unfavorable sign.

Erysipelas œdematodes.—In persons of a lymphatic temperament,

and in constitutions debilitated by previous disease or excess, there exists a disposition to the effusion of a serous fluid into the tissue of the derma and into the sub-dermal textures, constituting œdema. In this form of erysipelas (*Erythema œdematosum*, Mason Good) the inflamed surface is less brightly red than in the preceding varieties, the surface is smooth, tense, and shining, and a pale depression or pit is left upon the skin by the pressure of the finger. Erysipelas œdematodes occurs most frequently in the lower extremities and external organs of generation, and terminates like the simple form of the disease, the effused fluid being removed by subsequent absorption.

Local sub-varieties.

Erysipelas of the face.—The face is the most frequent seat of erysipelas. It commences usually on the side of the nose, and spreads rapidly over the whole of one side of the face, extending sometimes to both. The face is so much swollen by the attack that the features are scarcely recognizable. The cheeks are enlarged, the eyelids turgid and infiltrated, and the lips tumid. The constitutional symptoms accompanying the local disorder are exceedingly severe; there is violent headache, sleeplessness, frightful dreams, and commonly delirium. The disease reaches its height on the fourth or fifth day, and terminates on the seventh or eighth. It is frequently accompanied by inflammation of the mucous membrane of the nose and mouth, by a swollen and painful state of the parotid glands, and its resolution is occasionally indicated by a critical hemorrhage from the pituitary membrane. Erysipelas of the face is always serious, from the great liability to the occurrence of metastasis or extension to the brain, and it is frequently succeeded by subcutaneous abscesses and diffused suppuration; the latter sequela is most commonly met with in the neck.

When erysipelas of the head and face terminates fatally, death is usually occasioned by effusion within the head, and coma. Another cause of death is apnœa, from infiltration of the submucous tissue of the glottis; and a third, asthenia, or a total prostration of the vital powers.[1]

Erysipelas of the scalp is usually the consequence of a wound or injury of the head, and occurs in about a week or ten days from the reception of the violence. The affected integument is œdematous, smooth, shining, and very sensitive; but the redness is more dull than in other situations. When left to itself, erysipelas in this region issues in suppuration and gangrene of the cellular and fibrous tissue of the scalp. It often terminates by metastasis, or rather by extension to the brain.

Erysipelas of the mammæ.—From the quantity of cellular substance surrounding the mammary gland, erysipelas in this region is disposed to take on the phlegmonous character, and to terminate in extensive suppuration, and gangrene of the fibrous substance. The redness accompanying the exanthem is by no means vivid.

[1] Dr. Watson—Lectures.

Erysipelas of the umbilical region occurs in infants (erysipelas neonatorum), particularly in public institutions, and is referable to irritation produced by mismanagement of the umbilical cord, or, with more likelihood, to some endemic cause. From the umbilicus, the erysipelas extends to the integument of the abdomen, and frequently to the organs of generation. It sometimes gives rise to sphacelus of the integument and subcutaneous cellular tissue, and terminates fatally.

ERYSIPELAS PHLEGMONODES.

Phlegmonous erysipelas is much more severe in its nature than the simple varieties, and affects the deeper-seated textures, the subcutaneous cellular tissue, the superficial and deep fasciæ, and the intermuscular cellular tissue, as well as the integument. It may occur on any part of the body, but is most frequently observed in the extremities. This form of erysipelas terminates rarely in resolution, commonly in extensive suppuration, and gangrene of the cellular tissue and fasciæ.

The *constitutional symptoms* are identical with those which accompany simple erysipelas, but more severe, the violence of the symptoms being in great measure dependent upon the extent and depth of the inflammation. When the disease spreads widely and deeply, there is delirium, a dry and brown tongue, frequently diarrhœa, and copious perspirations.

The *local symptoms*, when the inflammation is comparatively superficial, are, vivid redness, which disappears on pressure, and returns slowly on its remission; tumefaction; a smooth, shining surface; and an acute, burning pain, augmented by the slightest touch. On the fifth or sixth day, if active treatment have not been adopted, the pain diminishes and assumes a throbbing character, the redness subsides, and an obscure fluctuation may be felt over the surface. Suppuration has now taken place more or less extensively, and the pus burrows beneath the skin and fasciæ in all directions, unless released by incision or ulceration. If an incision be made, it gives exit to healthy pus, mingled with small portions of dead cellular tissue. When the inflammation is disposed to terminate in resolution, the redness, pain, and swelling diminish on the fifth or sixth day, the epidermis becomes dry and scaly, and the effused fluids are gradually removed.

If phlegmonous erysipelas attack more deeply-seated textures, or an entire member, the inflammation appears suddenly, the pain is more severe and distressing than in the preceding form, and the surface is vividly red, tense, shining, and exquisitely sensitive. On the fifth or sixth day, and sometimes earlier, suppuration takes place, accompanied by throbbing, and preceded by occasional chills and rigors. The redness and pain diminish on the occurrence of suppuration, and an obscure fluctuation and boggy sensation are felt on the application of the hand. If the parts be opened at this period by a free incision, a large quantity of pus will escape, mingled with considerable flakes of cellular tissue in a state of gangrene. Should the incision be neglected, the pus spreads around the limb, burrowing beneath the fasciæ, between the muscles, and separating the integu-

ment from the parts beneath. Eventually, the matter discharges itself by means of ulceration; but the constitutional irritation is excessive; hectic fever is induced, accompanied by colliquative diarrhœa; and the scene quickly closes in death.

When the pus is bound down by aponeurosis, or fasciæ, the constitutional effects are still more intense than those above described. The integument, in a few days, becomes livid and dark-colored, large vesicles or phlyctenæ, containing a purplish serum, rise upon the surface, gangrene ensues, attended with entire prostration of the physical powers, and death speedily follows. In some cases, however, when the strength of constitution of the patient enables him to resist the effects of sphacelus, sloughs are formed, which are thrown off, and a granulating surface is slowly established. The issue of phlegmonous erysipelas in mortification, constitutes the sub-variety, termed *gangrenous erysipelas* [*Erythema gangrœnosum*, Mason Good].

Diagnosis.—The principal diagnostic characters of erysipelas are, inflammation of the skin, extending more or less deeply into the subcutaneous cellular tissue; tumefaction of the inflamed parts; a special disposition to spread; and symptoms of a dangerous fever, pursuing a regular and definite course. These signs serve to distinguish it from erythema, in which the inflammation is superficial, being limited to the derma; there is scarcely any tumefaction of the inflamed parts; the disposition to spread is comparatively absent; and there is little constitutional disturbance. Erythema læve may, at first sight, appear to be a contradiction to these characters, but the œdema in this affection is the cause, and not the effect, as in erysipelas; and erythema œdematosum may be regarded as a transition link between erythema and erysipelas.

The uniform redness of the inflamed surface, and its partial seat, sufficiently distinguish erysipelas from other exanthematous fevers. A few instances are on record wherein erysipelas is stated to have been universal, but such cases must be extremely rare.

Simple erysipelas is distinguished from erysipelas phlegmonodes, by the tumefaction of the latter extending more deeply, by the greater severity both of the local and constitutional symptoms, and by the violence of the inflammation expending itself on the part first attacked, without spreading to distant regions.

Causes.—Erysipelas appears to originate sometimes in infection or contagion, and is now and then seen prevailing epidemically, or running through the wards of an hospital. Puerperal fever has been shown to be one of the sources of the contagion of erysipelas, and the evidence on this head seems to place beyond question the fact, that these two diseases are reciprocally transmissible.[1] The predisposing causes of erysipelas are, some inherent peculiarity of the constitution, as in cases where it occurs hereditarily; or some morbid state of the system. It not unfrequently appears in those whose

[1] See an excellent paper on this subject in Dr. Ranking's "Abstract of the Medical Sciences" (vol. iv. 1846), from the pen of the editor.

nervous system is debilitated by mental emotions of a depressing kind, as anger and grief; by chronic disease; or by excesses. Under these conditions, the most trifling irritation may give rise to the affections; such as a scratch with a pin, a leech-bite, a blister, seton, or issue, &c. In like manner, a wound, either accidental, or occasioned by a surgical operation, may be the exciting cause of erysipelas. Persons with a thin and irritable skin, and members of the female sex, are especially liable to erysipelas. It makes its attack most frequently in the summer season, and is sometimes dependent on functional derangement, such as amenorrhœa, the critical period, &c. In delicate females it occasionally takes place periodically.

Prognosis.—The prognosis of erysipelas depends upon the various circumstances enumerated amongst its causes. When the fever is moderate, the constitution sound, and the local inflammation not extensive, the disease may be regarded as of little consequence. When, however, the constitution is debilitated, the invasion of erysipelas is to be apprehended, not only from the deficient power of the system, but also from the liability which exists to inflammation of the superficial veins and lymphatics, and purulent deposits in the viscera. The prognosis is also unfavorable when it occurs either in the very young or in the very old; when it is associated with a wound; when it is complicated with vomiting, or vomiting and purging; or when it succeeds to anasarca. The metastatic form is always dangerous, from the possibility of some vital organ being secondarily attacked. Erysipelas erraticum occurring in the progress of chronic disease is also of dangerous import. Phlegmonous erysipelas, on account of its severity, is always dangerous, and requires the most vigilant care.

Treatment.—The management of erysipelas presents two indications: *firstly*, to subdue the fever; and *secondly*, the local inflammation.

The first of these indications is to be effected by means of rest, an invalid diet, neither too low nor too stimulating, a brisk purge, aided by an active dose of sulphate of magnesia and senna, rhubarb and magnesia, or rhubarb and sulphate of soda, to clear out the digestive canal; subsequently saline diaphoretics; and if there be much irritability and restlessness, opium; and when the violence of the febrile symptoms has abated, or the vital powers flag, diffusive stimulants, wine and tonics. Few constitutions will bear the abstraction of blood; and it must be remembered that erysipelas rapidly exhausts the powers of life, is asthenic in its character, and speedily makes a demand for stimulant remedies. An active purgative at the outset of the complaint, once or twice repeated, will, besides performing the necessary office of emptying the alimentary canal and biliary ducts, reduce the vascular system as much as the constitution will bear. We may then follow it up with the liquor ammoniæ acetatis and sesquicarbonate of ammonia; or the latter in effervescence with lemon-juice; or, better still, the sesquicarbonate of ammonia should be given in simple solution in water, in doses of three to six grains every two to four hours, as recommended by Drs. Peart and Wilkinson for scarlatina and measles; and once or twice in a day a dose of Dover's powder. As

soon as the first violence of the febrile symptoms is abated, the diet may be improved. Wine may be added, and tonics of bark or quinine with the mineral acids exhibited.

The tincture of the sesquichloride of iron is regarded by Dr. George W. Balfour[1] as a specific. "Erysipelas," he observes, "is one of the few diseases for which I now believe we have a certain and unfailing remedy, and this, whether it be infantile or adult, idiopathic or traumatic." He first of all clears the bowels with a smart purge, such as ten grains of calomel with a drachm of jalap, or two drachms of sulphate of potash; and then administers twenty drops of the tincture of the sesquichloride of iron in simple water every two hours until the disease is subdued. He found it to remove pain, lessen the heart's action, clean the tongue, and to act as a diuretic on the kidneys; while its special influence is exerted on the capillary vessels of the skin. It should be administered regularly, so as to saturate the system as quickly as possible; for it is not until the point of saturation is attained that it effects its curative action. It may be given in any stage of the fever, even in high delirium; it never produces headache; it arrests suppuration even in phlegmonous erysipelas; and it brings about a cure in less than a week. In infants of four months old he prescribes two minims as a dose, and increases the dose in proportion to the age of the patient. One of his cases brings the remedy in contrast with the sesquicarbonate of ammonia; a patient affected with scarlatina was at the same time suffering under erysipelas; the ammonia which he was taking for the scarlatina made no impression on the erysipelas; but when the sesquichloride of iron was given the erysipelas got well.

Dr. Robert Williams remarks with regard to the treatment of erysipelas: "The mode, then, in which I am in the habit of treating idiopathic erysipelas, whatever may be the part affected, or with whatever symptoms it may be accompanied, is as follows: The patient is put on a milk diet, the bowels gently opened, and from four to six ounces of port wine, together with sago, allowed daily. This mode of treatment it is seldom necessary to vary throughout the whole course of the disease; for the delirium, if present, is generally tranquillized; if absent, prevented; the tongue more rarely becomes brown, or only continues so for a few hours; while the local disease seldom passes into suppuration or gangrene. In a word, all the symptoms are mitigated, and the course of the disease shortened. I have pursued this system for several years, and I hardly remember a case in which it has not been successful."[2]

This author records several remarkable instances of the advantages of his method of treatment. He does not limit the quantity of wine to that above stated, but in more severe cases, when the local disease still continues to extend, and the delirium to augment, he increases the wine to eight ounces, and adds to it the influence of quinine. "Two cases of erysipelas," continues the author, "not less instructive, were recently treated in St. Thomas's. The patients were both stout, healthy

[1] Monthly Journal of Medical Science, vol. xvi, 1853, p. 426.
[2] Page 284.

young women, and nearly of the same age; the seat of the disease also was the same, on the head and face, and they suffered equally from delirium, so that the difference between them, if any, was scarcely distinguishable. For the one, four ounces of wine were prescribed on the Saturday, and there appeared no sufficient reason to increase the quantity on the Monday: but between Monday and Thursday, the day on which I next saw her, she had so sank that it was impossible to recover her. The other case was admitted about three days later, and, in the first instance, only four ounces of wine were prescribed for her; but, warned by the fate of the former person, although she was highly delirious, I immediately increased the wine to eight ounces, and added also two grains of quinine every six hours. Under this treatment she rapidly recovered, so much so, that in four or five days it was thought practicable to reduce the wine to its original quantity, or to four ounces. But on this reduction being made the disease immediately returned, and it was once more necessary to raise it to eight ounces, and the patient now rapidly recovered."

Mr. Grantham of Crayford, in Kent, a successful practitioner and original thinker, suggests the propriety of making early observation of the state of the urine in erysipelas. "I begin," he observes, "with large doses of carbonate of ammonia, spirits of ammonia, and camphor mixture, as an alkaline mode of treatment, which is generally indicated in the early stage of the inflammation, but towards the sequel of the disease a contrary mode of treatment is necessary, namely, small doses of sulphate of magnesia, with full doses of the acidum sulphuricum aromaticum. The diet should be liquid and nutritive, with a full proportion of common salt; and narcotics should be avoided unless indicated by an alkaline state of the urine." It must be remembered that Mr. Grantham's field of observation is a healthful neighborhood, remote from the causes of depression which exist in towns and cities. In the latter sedatives appear to form as essential a part of the treatment as stimulants. The dose of sesquicarbonate of ammonia may be as much as five or six grains every three or four hours.

By some practitioners an emetic has been strongly recommended in the outset of the fever, and followed up during its progress by small doses of tartarized antimony. The excitability which accompanies the fever is to be calmed by sedatives, such as hyoscyamus and morphia, as circumstances may suggest, the latter remedy being frequently necessary at night, and in the more advanced stages of the disease. Two valuable and important medicines in erysipelas are aconite and belladonna; both of these remedies act by reducing the excitement of the arterial system, and procuring rest. The extract of aconite is especially useful in checking the heart's action, and promoting cutaneous transpiration, and for this purpose should be administered in half-grain doses every four hours. Mr. Liston remarks, that after the aconite has performed its office, the extract of belladonna, in doses of one-sixteenth of a grain, is productive of the most beneficial effects.

In erysipelas about the head and face, the feet and legs of the patient should be immersed in a mustard bath, and mustard poultices or blisters applied to the calves of the legs.

The second indication, namely, that which relates to local treatment, is to be fulfilled, in milder cases, by rest, position, evaporating lotions, sedative lotions, poppy fomentations, or water-dressings, the temperature of the applications being determined by the feelings of the patient. A lotion which I have found of much service in allaying the uneasiness of feeling attendant on erysipelas, is one composed of a drachm of sesquicarbonate of ammonia, the same quantity of diacetate of lead, and half an ounce of laudanum to a pint of water. But inunction with lard is in every way superior to all fluid applications. My friend, Mr. Grantham, to whom I am indebted for the first suggestion of lard, remarks with regard to its use: "My plan is to relax the skin with hot water or steam fomentations, and, after each fomentation, to saturate the inflamed surface with hot lard, which is afterwards covered with wool." If there be soreness of throat from congestion of the fauces, it should be touched with nitrate of silver.

On the head and face, fomentations and fluid applications are generally inconvenient, and their place may be usefully supplied by inunction with lard, or by flour dusted copiously on the surface from the dredging-box. In more severe cases the congestion of the vessels of the skin is best relieved by puncturing the surface very freely with the point of a lancet, and afterwards using warm sedative lotions and fomentations of chamomile and hops.

This practice was pursued by Sir Richard Dobson for many years, and always with the most favorable results. He observes that the punctures heal in the course of a few hours, that he makes them on every part of the body, and that he never saw any ill consequences result. Sir Richard Dobson was in the habit of making from ten to fifty punctures, about a quarter of an inch in depth, on the inflamed surface, and repeating the operation two or three times a day, as the case appeared to demand. Mr. Liston advocates the same plan. For some time I have adopted this method in the local treatment of erysipelas, and always with good effect. It is remarkable how quickly the tension and pain are diminished, and the tumefaction reduced.

The relief afforded to the inflamed surface by inunction and puncture, must be referred to two principles altogether different from each other; the one being, so to speak, endosmotic, the other exosmotic. But a substance which has been recently employed as an application to the skin, namely, collodion, is known to possess both these properties in conjunction, and, among the numerous experiments which have been made of its virtues, has been found to be a valuable topical agent in erysipelas, compressing the surface, and so relieving tension and pain, constituting an impermeable varnish, and so preventing cutaneous oxygenization of the blood, and the development of caloric, which results from that chemical combination. As the purpose of the collodion is to form an impermeable covering, it should be applied with a brush over the entire of the inflamed surface, and repeated as frequently as may be necessary.

Great benefit is sometimes derived from the application of a strong solution of nitrate of silver to the inflamed surface. Mr. Higginbottom, of Nottingham, by whom this mode of treatment is recommended,

gives the following statement of his plan: "The part is first to be washed in soap and water, to remove any oily substance from the skin, and then is to be wiped dry; the inflamed and surrounding skin is next to be moistened, and a long stick of the nitrate of silver is to be passed over the moistened surface, taking care that not only every part of the inflamed skin should be touched, but the surrounding healthy skin, to the extent of an inch or more beyond it, in severe cases. The nitrate of silver may then be passed over these surfaces once, twice, thrice, or more times, according to the degree of inflammation; once in slight cases, twice or three times in common cases, and more frequently if quick vesication be required." During the last eleven or twelve years Mr. Higginbottom has found a solution of eight scruples of nitrate of silver with twelve drops of nitric acid in an ounce of water, more convenient than the solid salt. He regulates the application of the solution according to the degree of severity of the local inflammation, and prefers a dossil of lint, tied on the end of a piece of stick, to a camel's-hair pencil, for its diffusion over the surface. "The success of the nitrate of silver in external inflammation depends upon its strength and its proper application. The method of applying it by some practitioners appears to me to be quite trifling with the remedy. Instead of covering the whole inflamed surface and the surrounding healthy skin with the nitrate of silver, so as to cover the whole of the inflammation, they simply apply it around the inflamed surface, a mode of proceeding which has seldom the power of even preventing the spreading of the disease, or the deeper mischief when the inflammation itself is unarrested. Sometimes, even after the most decided application of the nitrate of silver, the inflammation may spread, but it is then generally much feebler in character, and easily checked by the repeated application of the remedy." "I consider the application of the nitrate of silver as perfectly safe. I have seen no case of metastasis or any other bad effects from the use of it during upwards of twenty years."[1] Mr. Higginbottom further recommends that where erysipelas extends to the scalp, the head should be shaved, in order that the extent of the disease may be fully ascertained, and that the solution may have a fair chance of completely covering it. It should be applied very freely on the scalp, where, he informs me, "it scarcely ever produces vesication."

M. Jobert[2] has used, with great success, an ointment composed of nitrate of silver and lard, in the proportion of from two to four drachms of the salt to an ounce. This is applied night and morning to the inflamed skin, and for a small space beyond it, and a thin layer is left on the surface.

The nitrate of silver is an excellent means of limiting the extension of the disease, by encircling the inflamed part with a line drawn with a wetted stick of the caustic. When an extremity is attacked, the defensive cordon must extend completely around the limb, above the affected part; and if this simple manœuvre be properly performed, the inflammation will, in many cases, be limited to the part first

[1] Lancet, vol. ii., 1843, p. 515.

[2] Gazette des Hôpitaux, May 11, 1848.

attacked. Nitrate of silver appears to act by exciting an effusion of lymph and adhesive inflammation in the line of its application, which opposes an obstacle to the propagation of the exanthema; upon the same principle, a narrow or linear blister has been used to form the circle, but whether it possesses any superiority over the nitrate of silver is very doubtful. The erratic form of erysipelas may frequently be fixed to the spot originally affected, by the application of a blister; and this is the practice usually resorted to for the purpose of recalling the disease, where it has suddenly disappeared by metastasis. In erysipelas phlyctenodes the vesicles should be opened, and the contained fluid gently pressed out and absorbed by a soft sponge. The epidermis of the phlyctenæ should be preserved as entire as possible, and replaced upon the denuded derma. This manner of treating the vesicles of erysipelas is infinitely superior to the ancient plan of covering them with starch powder, zinc powder, &c. Œdematous erysipelas is especially benefited by the punctures above recommended, followed, as soon as the inflammation is subdued, by compression with a bandage. Erysipelas of the scalp, when it affects the deep-seated textures, as in wounds and bruises of the head, is instantly relieved, and the danger of the disease mitigated, by a free incision carried down to the bone.

Velpeau recommends a solution of sulphate of iron, in the proportion of an ounce to the pint of water, as a local application in erysipelas. This solution, he remarks, produces a sudden improvement in the patches, and causes their decline in one or two days. As frequently as new patches make their appearance, they are to be treated in the same manner, until the constitutional morbific influence is expended. In situations where a lotion would be inconvenient, this surgeon employs an ointment, containing a drachm of the salt to an ounce of lard.

Dr. Fahnestock, of Pittsburg, speaks in great praise of pure creasote as a local application in erysipelas. It should be sufficiently strong to render the cuticle white immediately it is applied, and should be pencilled over the whole of the inflamed surface, and for a small space beyond it. In phlegmonous erysipelas the application should be made more frequently than in the idiopathic kind, and a cold bread poultice or compress, moistened with a solution of creasote, kept on the part. When the mucous membrane of the mouth or fauces is affected, he uses a solution of nitrate of silver, of the strength of half a drachm or a drachm to the ounce.

Dr. James Arnott advocates congelation as a local remedy for erysipelas, and adduces numerous cases as examples of its success.

Phlegmonous erysipelas requires great activity of management. At the outset of the inflammatory attack the patient should be freely purged. The affected part should be placed in a position to facilitate the circulation through the limb as much as possible. Leeches should be applied, and followed by fomentations and water-dressings. If these means fail to restrain the progress of the disease, two or more incisions, according to the extent of the inflammation, should be made through the affected tissues, so as to divide freely the superficial

and deep fascia, and offer a clear passage to any pus that may have been formed. To effect the object completely, the incisions should be two or three inches in length, and sufficiently deep. The advantages of this mode of treatment are obvious; the congested vessels of the inflamed part are relieved, and the tendency to morbid action consequently diminished. The tension, pain, and tumefaction are reduced, even where no matter is already formed; and when suppuration is established, a free outlet is given to the pus, and flakes of gangrenous cellular tissue. Whenever we are led to infer, from the severity of the constitutional symptoms, that pus is bound down by fascia, as in the hand and foot, a free incision is the proper treatment, even although no swelling may be present. After the incisions, the fomentations and warm water-dressing should be continued; and on the decline of the inflammation, a bandage applied, to facilitate absorption of the fluids effused into the surrounding tissues.

The general treatment applicable to erysipelas phlegmonodes is the same as for simple erysipelas, and sedatives are especially valuable. As soon, however, as the immediate inflammatory symptoms have subsided, tonics must be employed and aided by a more generous diet.

ROSEOLA.

Syn. *Exanthesis roseola;* Mason Good. *False measles. Rose-rash. Cutaneous blush. Roseole*, Fran.

Under the name of roseola, Willan has described certain forms of cutaneous inflammation, some of which seem to occupy a middle position between erythema, urticaria, and rubeola, without being strictly referable to either; while others ought more properly to be considered under one or other of the before-mentioned heads. The title of this affection is, perhaps, the most objectionable in the entire nomenclature of diseases of the skin, since color can only be an accidental character, depending for its existence upon a greater or less congestion or distension of the vascular rete of the derma, and, therefore, liable to constant change from trivial causes. The true characters of the disorder must evidently be sought in the morbid conditions which collectively constitute the disease; in other words, in those symptoms which appear to be characteristic of the affection.

Roseola (Plate VII.) is a non-infectious and non-contagious inflammation of the skin; characterized by febrile symptoms which assume the subacute type, by patches of redness, of small size and irregular form, distributed over more or less of the surface of the body, and by more or less redness of the fauces. The exanthema is transient, is accompanied by more or less prickling or tingling of the skin, is brightly red or crimson at first, subsides gradually into a dull roseate tint, and disappears by degrees, often leaving behind it petechial or ecchymosed spots and the discoloration which follows a bruise.

Willan has described seven varieties of roseola, to which five other varieties may be added; three of these, namely, roseola rheumatica, arthritica, and cholerica, resting on the authority of Bateman and

Rayer; one, roseola punctata, described by myself; and one, roseola febris continuæ, embracing the roseolous eruption common to typhus and typhoid fever. The whole of these forms may be arranged into two groups: *idiopathic*, in which the exciting cause is not immediately manifest; and *symptomatic*, which depend obviously upon some local source of irritation, or are associated with some existing disease. These are—

Idiopathic.	*Symptomatic.*
Roseola infantilis,	Roseola variolosa,
" æstiva,	" vaccina,
" autumnalis,	" miliaris,
" annulata,	" rheumatica,
" punctata.	" arthritica,
	" cholerica,
	" febris continuæ.

ROSEOLA INFANTILIS.

False Measles.

In roseola infantilis the patches of redness are of small size, and closely grouped together, and resemble, in general appearance, the eruption of rubeola. They are subject to much variety in relation to extent, duration, and the local inconvenience to which they give rise. Thus, in one case, they are limited to a small district of the skin, or to the limbs, while in others they are dispersed over the entire body. In one case, again, they are fleeting, and disappear in the course of a day or two, while in others they are prolonged to a week or more. Sometimes they are productive of little inconvenience, and at others excite troublesome itching and tingling. The constitutional symptoms, like the other characters of the affection, are marked by uncertainty in respect of degree; in some subjects the febrile indications are severe and active, while in others they are transient, and speedily decline.

ROSEOLA ÆSTIVA.

False Measles.

Roseola æstiva (Plate VII., E.) is the common form under which the disease presents itself in the adult: it is developed, as implied by its name, chiefly in the summer season, and attacks persons of a weakly and irritable state of system, particularly of the female sex. The disorder usually commences with the ordinary series of febrile symptoms of the slighter kind, namely, chills succeeded by flushes of heat, languor, pains in the head, back, and limbs, restlessness, quickened pulse, and thirst. These are followed, in a few days, varying in number from three to eight, by an eruption appearing first about the face, neck, and arms, and then extending to the body and lower extremities. In general appearance the rash resembles rubeola;[1] but,

[1] "Portraits of Diseases of the Skin:" the eruption of Roseola is well shown in Plate XXIV., P., which represents a case of Roseola Syphilitica.

on closer examination, is found to consist of patches of larger size and more irregular form, and, at a later period, the difference is still more striking, in consequence of the change of tint to a dark roseate hue. The fauces are also affected by the disease, presenting a deep red tint, with some degree of swelling of the mucous membrane, and enlargement of the tonsils. The eruption appears ordinarily in the evening, and arrives at its height on the following day, being accompanied with tingling and itching. On the fourth day the rash begins to fade, and on the fifth disappears, together with the constitutional symptoms.

The eruption is sometimes local in its attack, being confined to the face and neck, which become tumefied, and exceedingly painful. It is liable also to delitescence, in which case the constitutional symptoms are aggravated, and relieved only by the reappearance of the rash.

ROSEOLA AUTUMNALIS.

Roseola autumnalis is met with chiefly among children, but I have seen it also in the adult, and it occurs generally during the autumnal season. The constitutional symptoms are very slight, being limited to a trifling indisposition, with congestion of the fauces. The eruption appears in roundish circumscribed patches, of about the size of a shilling, and of a very dark hue, seeming, at a distance, "as if stained by the juice of black cherries or mulberries." The patches occur most frequently on the arms and legs, rarely on the face and body. They continue for about a week, give rise to very little itching or local inconvenience, and are succeeded by a slight furfuraceous desquamation.

ROSEOLA ANNULATA.

This form of roseola[1] is characterized by the figure of the eruption, appearing, in the first instance, as rose-red circular spots, and increasing in a short space of time into rings of variable size, having a central area of natural skin. This eruption possesses all the general characters of roseola, as described in roseola æstiva. It appears after a slight attack of constitutional symptoms, which are relieved by the outbreak of the eruption, and aggravated if it should chance to recede; it occasions considerable tingling and smarting of the skin, which are increased during the night, so as frequently to destroy rest; and it affects, more or less extensively, the mucous membrane of the fauces. When the disorder sets in with severe symptoms, the eruption reaches its height on the fourth day, and terminates, like roseola æstiva, at the end of a week or ten days. When, however, it assumes a milder type, it may endure for several months, and recur at intervals. Willan relates the case of a lady who suffered from this disease for several months together for three successive years. On its decline, it leaves behind it stains on the skin like those produced by a bruise;

[1] "Portraits of Diseases of the Skin," Plate II., AK, exhibits a good example of Roseola Annulata.

and not unfrequently a deep-seated tenderness, as if the bruise extended into the substance of the limb.

ROSEOLA PUNCTATA.

Roseola punctata is a rare affection, of which I have seen only a few examples. Its characters are as follow:

Febrile symptoms of a subacute type, accompanied with redness of the eyes, slight coryza, redness of the fauces, and swelling of the mucous membrane of the mouth, ushering in an exanthema at the end of three days; the exanthema appearing on the mucous membrane and skin; on the latter, in the form of small red spots occupying the mouths of the follicles, then becoming diffused so as to cover the greater part of the body, reaching its height on the third day; at first of a bright raspberry-red color, afterwards acquiring a dull roseate hue, the dulness increasing with the progress of decline; *the primary red spots resembling dull red stains* as decline advances, and fading by degrees after the disappearance of the rash; the entire attack lasting ten days, of which three belong to the febrile period, three to the exanthema, and four to its decline, the dark stains being perceptible for some days afterwards, the rash assuming a difference of form on different parts of the surface, such differences being all referable to roseola. The following is an example of this form of exanthema. For the opportunity of observing it I am indebted to Mr. Marson, the resident surgeon of the Small-pox Hospital, who, during a connection of twelve years with that hospital, has seen about ten cases:

A young man, aged twenty-four, of good constitution, engaged as light porter in a draper's house in Oxford Street, exposed himself to cold by riding on the outside of an omnibus during the prevalence of cold winds. At the end of his journey he felt chilled, and, in the course of the same evening, experienced headache, pain in his limbs, and sensations of general illness.

Sept. 8th.—On the following morning, after a restless night, he arose fatigued; his headache had increased, his appetite was gone, and he performed his duties painfully and wearily. He was chilly during the day, and in the evening feverish; had a dry mouth, and retired early to bed.

9th.—He had still greater difficulty in getting through his work today than yesterday. His symptoms were the same, but increased in severity. At night, after getting to bed he smoked a cigar and took a basin of gruel, and being well covered up, broke out in a profuse perspiration.

10th.—This day he scarcely felt able to rise from his bed; but succeeded in getting down stairs and cleaning some knives. While engaged in that occupation he observed an eruption of small red spots on his arms, and soon afterwards returned to his bed. On taking off his clothes he found his whole body covered with spots, the upper parts being most, and the lower least affected. He remarked, also, that

his eyes looked red, that his lips were swollen, and that there were red spots likewise inside his mouth.

11th.—Having been seen this day by a medical man, he was sent to the Small-pox Hospital, under the impression that the eruption was incipient small-pox. At this time the eruption consisted of small red spots, the centre of each spot being very slightly raised, and corresponding with the aperture of a cutaneous follicle.

12th.—The redness of the eyes, accompanied with coryza in a slight degree, the swelling of the lips, and the spotted state of the mucous membrane of the mouth, were at their height to-day, and to these symptoms were superadded a cough, making the general symptoms very similar to those of rubeola. The red spots had now become confluent, and assumed the character of patches, which covered the greater part of the body. The congested skin was slightly raised above the level of the unaffected parts, and the color presented the raspberry hue of measles.

13th.—The patient's eyes were still somewhat congested, his lips swollen and dry, the mucous membrane of the mouth was thickly covered with red spots, the fauces were red, his tongue was coated with a white, moist deposit, which was beginning to separate in flakes, leaving the surface beneath quite smooth, and he uttered occasionally a short, mucous cough.

The efflorescence had a decidedly rubeolous hue, but offered some variety of appearance on different parts of the body. On his face, which was somewhat swollen, the patches of redness were irregular in form, and diffused.

On the trunk of the body, and particularly on the abdomen, the efflorescence presented the ordinary rubeolous appearance of common roseola.

On the arms and legs the red patches had run together, so as to cover the greater part of the skin, and form a dull, red ground, which was studded all over with spots of a dark red color. These spots, which I have assumed as the specific character of the eruption, were the original red points by which the efflorescence commenced. They presented a deeper red than the rest of the surface, were about two lines and a half in diameter, and were dark and slightly raised in the centre. The redness was partly the effect of congestion, and partly of transudation of the coloring principle of the blood; and in some few situations, as around the ankles, and upon the back of the shoulders, where the weight of the body rested, there was a decided ecchymosis from the latter cause. It was obvious that these red points represented the follicles of the skin, in which the inflammation commenced, and the elevated centre was the pore raised above its natural level, as a joint effect of the congestion of the capillary vessels, and effusion into the meshes of the vascular network.

On the neck the efflorescence appeared in the form of patches distinctly circumscribed, slightly elevated, more or less circular in figure, and of an average size of half an inch in diameter. On careful examination, these patches were seen to be formed by the confluence of a number of small circular congested spots, each taking its rise around

the aperture of a follicle, and many of these separate spots, of about a line in diameter, were sprinkled in the interspaces of the patches. In several of the larger patches there were one or more yellowish spots, which, at first sight, gave the idea of the elevations of urticaria, but which the changes succeeding on the following day proved to be faded points indicating the decline of congestion. The increase of these pale spots gradually converted the patches into rings, and the latter finally disappeared. I must remark, that the spots above referred to were quite distinct from the deeper colored and star-like spots on the arms, which suggested the specific name, "punctata," which I have given to the disease.

14th.—The eruption is now on the decline. The efflorescence is of a duller hue; the spots have more the character of stains than yesterday, and the patches on the neck are converted into rings; on the abdomen, chest, and thighs, the efflorescence is fading away, like ordinary roseola. The thin skin of the penis has a remarkable appearance, from being covered with deep rose-red stains.

On Friday, and the two following days, the general symptoms improved, while the efflorescence continued to fade, and on Monday he was sufficiently well to be revaccinated, and to leave the hospital.

ROSEOLA VARIOLOSA.

Variolous roseola is an erythematous inflammation of the skin, which not unfrequently attends the eruptive fever of inoculated small-pox, appearing on the second day from the commencement of the constitutional symptoms, and the ninth or tenth after inoculation. It shows itself, in the first instance, on the breast, the face, and arms, and then extends, during the second day of its eruption, to the trunk and lower extremities; on the third day the roseate rash diminishes in vividness, and on the fourth subsides altogether. The proportion in which roseola occurs in inoculated small-pox is one in every fifteen cases. In natural small-pox it is more rare.

Variolous roseola has been regarded as favorable to the prognosis of small-pox, and indicative of a mild eruption. When, however, the color of the rash is deep and dusky in its tint, and the eruptive fever severe, the most dangerous form of small-pox may be apprehended. In some instances of inoculation, the roseola has been known to supersede the eruption of the small-pox, and the patient is said to be equally protected against variolous infection. It occurs chiefly in persons endowed with a delicate and irritable skin.

In the management of cases of this affection, it is desirable to guard against the retrocession of the rash. For this purpose, the patient should be confined to his room, although children so affected are frequently carried into the air, and exposed to the cold, without inconvenient results.

ROSEOLA VACCINA.

Roseola vaccina is an efflorescence similar to that which accompanies variola; it follows the development of the vaccine vesicle,

appearing on the ninth or tenth day, but much more rarely than after inoculation. It occurs in the form of small erythematous patches, which seem to be propagated from the inflamed halo of the vaccine vesicle, and, in some instances, are diffused over the entire surface of the body. The eruption rarely lasts more than two days, and appears only in children possessed of a delicate and irritable skin.

ROSEOLA MILIARIS.

Under the name of roseola miliaris, Bateman describes an erythematous inflammation of the skin, accompanied by the development of small vesicles, which he observed on the ninth day and towards the close of continued fever. This eruption consisted of oval-shaped and slightly-raised patches, which appeared upon the arms and breast, and were followed by a decided remission of the febrile symptoms. The patches increased in size for the space of three days; they were of a bright rose color at first, diminishing gradually in redness, and assuming a bluish tint, and at the end of this period they disappeared altogether.

Miliary vesicles, or sudamina, are not unfrequently met with during the second week of typhus, typhoid, and relapsing fever; they are most commonly developed on the sides of the neck, on the chest, and in the axillæ, and are usually associated with the roseola of those fevers; they generally accompany the perspirations which occur towards the end of the second week of typhus and typhoid fever, and the critical sweat of relapsing fever. Appearing under these circumstances, their consideration belongs to continued fever rather than to roseolous eruption.

ROSEOLA RHEUMATICA ET ARTHRITICA.

Rheumatic and arthritic roseola is an erythematous inflammation of the skin, appearing in spots and patches, of various size and form, and upon different parts of the body, in persons affected with rheumatism or gout. In some instances the efflorescence precedes the attack, which invades immediately upon its decline; in other cases, the eruption appears during the progress or towards the close of the disease. In Wurzburg, where rheumatism is endemic and very severe, the exanthem makes its attack at the commencement of the disease, and after one or two days of suffering from gastric and febrile affection. The eruption in this case consists of small roundish spots, which first show themselves on the legs, and thence extend to the rest of the body. They present the deep rosy color, subsequently becoming purplish and livid, which is characteristic of roseola.

ROSEOLA CHOLERICA.

This form of roseola rests on the observation of Rayer, who saw the variety during the prevalence of cholera, in Paris, in 1832. "After the period of reaction," he says, "there occurred in some patients,

especially in women, an eruption which most generally appeared on the hands and arms, and then extended to the neck, the breast, the belly, and the upper and lower extremities. At its commencement it was characterized by patches, for the most part of an irregularly circular shape, of a bright red color, elevated above the surface, and but slightly itchy. Very numerous on the hands, arms, and chest, they were less so on various other parts; in some places they were crowded together, tended to confluence, and had an appearance very analogous to the efflorescence of slight scarlet fever; in other places the aspect of the eruption was rather like that of measles; and in others even more like that of urticaria.

"I have seen this inflammation complicated with an inflammatory affection of the fauces and tonsils, and its disappearance followed by an aggravation of the general symptoms, and, sometimes, even by death. On the chest the spots occasionally became confluent, and gave rise to patches as broad as the hand, raised above the general level, and pretty well defined. The eruption then acquired a dirty pink or rose color. About the sixth or seventh day the epidermis cracked, and was thrown off in large flakes on almost all the places where the eruption had existed."

ROSEOLA FEBRIS CONTINUÆ.

Roseola is not unfrequently present in continued fever, in typhus, in typhoid fever, and in the relapsing fever; and may be regarded as the cutaneous manifestation of the elimination of the special poison of continued fever from the blood. In these fevers the skin is more or less muddy and discolored, and at the beginning of the second week a roseolous eruption is developed more or less extensively over the surface, the characters of the eruption being influenced by the nature of the fever; having a bright rose color in typhoid fever, and a mulberry color in typhus. The exanthem may be distributed more or less profusely over the trunk of the body and limbs, or it may be limited to the extremities, and sometimes to the back of the hands; it rarely occurs on the face. The eruption is successive, a fresh crop taking place each day, and running a course of three days; so that after a few days it may be seen in all its stages, crescent, mature, and fading.

The roseola of typhus is distinguished by its *mulberry* color and by its petechial character. It is persistent under pressure with the finger, and persistent after death.

The roseola of typhoid fever is of a bright rose tint, often papular, scantily distributed over the surface, and disappears under pressure with the finger and after death.

The roseola of relapsing fever passes quickly into the state of petechiæ, and is more frequently accompanied with miliary vesicles than the preceding form.

Diagnosis.—Roseola is distinguished from other exanthemata by negative rather than by positive characters. The diseases with which

it is most likely to be confounded are rubeola, scarlatina, erythema, urticaria, and purpura.

The varieties of roseola the most nearly allied in appearance to rubeola are, roseola infantilis and roseola æstiva; but particularly the former, which is probably frequently mistaken for measles, and, indeed, is known by the trivial name of "false measles." The diagnostic characters by which it is distinguished from rubeola are, the absence or extreme mildness of the catarrhal symptoms, the inferior degree of febrile affection, the larger size, more irregular form, and deeper color of the patches, their progress from the extremities to the trunk of the body, and above all, the uniformity of the redness as contrasted with the punctiform character of that of rubeola. Moreover, the latter is contagious, and generally of epidemic origin, which is not the case with roseola. These remarks apply also to the diagnosis between roseola and scarlatina, substituting for the catarrhal symptoms of rubeola the angina of scarlatina.

The degree of congestion affecting the skin in roseola is very similar to that of erythema; in both the patches are irregular and uniform in tint, but in the former are for the most part smaller than in the latter, and of a venous character. The form originating in local irritation it would be more correct to consider as an erythema.

From urticaria, the distinction of roseola lies in the light-colored and raised spots and wheals of the former, as contrasted with the more uniform redness of the patches of the latter. Sometimes, as in roseola annulata, the red spots have pale centres even at the beginning, but there is no elevation as in urticaria. The local inconvenience, also, is greater in urticaria; for, although in both, itching and tingling are prevailing characters, these symptoms are more severe in urticaria, and are accompanied by pricking and stinging.

Causes.—Roseola is met with in children, in persons with a thin and delicate skin, of weakly and irritable constitution, and particularly in females. In infants, the exciting cause is teething, intestinal irritation, or objectionable diet. In adults, it may be occasioned by any causes which disturb the functions and circulation of the skin during its period of increased activity, namely, in the summer season. Of this kind are, exposure to a draught of cold air, when the body is heated by exercise; drinking cold water while the body is warm, distressing the stomach with an overload of fruit, indigestible substances, copaiba, &c. Other causes are, gastric and intestinal irritation, and disordered menstruation. The forms called into action by local irritation are obvious in their causes, while those which accompany rheumatism, gout, cholera, or continued fever, are occasioned by an effort of evolution of the gouty or other morbid salts or poison by the skin.

Prognosis.—Roseola is a slight affection, and one of favorable termination. When it occurs critically in connection with constitutional disease, it is of good omen, as implying a derivative action, and should be encouraged.

Treatment.—In the treatment of roseola, the cause, when obvious, should be removed; in the case of children suffering from dentition,

this is best effected by scarifying the gums, and exhibiting a dose of castor-oil; and where intestinal irritation is in fault, by one grain of calomel well triturated with one of sugar, by the hydrargyrum cum cretâ combined with rhubarb, by soda with rhubarb, or by fluid magnesia, to regulate the secretions, these measures being assisted by a light and moderate diet. In adults; laxatives, diluents, and salines, followed, in weakly persons, by tonics combined with mineral acids, are the appropriate remedies; a mixture consisting of infusion of roses, with one drachm of sulphate of magnesia, and one grain of sulphate of quinine the dose, will often conduct a patient to a favorable issue without any other assistance. The varieties accompanying particular diseases call for the treatment applicable to those diseases; as, for instance, alkalies in the case of rheumatism, &c. When disordered menstrual function is the exciting cause, recourse must be had to steel medicines, aloetic aperients, &c. Local remedies are rarely necessary, and are only called for when the itching and tingling are troublesome. In this case, a lotion of sesquicarbonate of ammonia, a drachm to the half pint of rose-water; a lotion of liquor ammoniæ acetatis with mistura camphoræ, equal parts, and used tepid, or an emulsion of bitter almonds with hydrocyanic acid, a drachm to the half pint, and also used tepid, might be of service. Sponging with tepid water containing a little vinegar frequently answers every purpose. These remedies would only be required if the pruritus were severe, seeing that it would be undesirable to run the risk of chilling the surface and repelling the eruption. There is less chance of such an occurrence when an unguent is employed; therefore, where a local application seems indispensable, the oxide of zinc ointment, rubbed down with camphorated spirit or spirit of wine (℥j ad ℥j) would be found to be the most efficacious; or, simply, warm lard.

URTICARIA.

Syn. *Enanthesis urticaria;* Mason Good. *Uredo. Nettle-rash. Fièvre ortiée porcelaine. Essera,* Ital. *Urticaire,* Fran. *Brennesselausschlag,* Germ. *Cnidosis,* Alibert.

Urticaria, or nettle-rash (Plate VII.), is a transient and non-contagious inflammation of the skin; it is characterized by the eruption of small elevations, having a round, oval, or wheal-like form, of a whiter or redder tint than the healthy integument, and surrounded by a diffused redness of greater or less intensity. Urticaria is preceded and accompanied by febrile symptoms, and is associated with more or less irritation of the gastro-pulmonary mucous membrane. The eruption is attended with itching, and a burning and tingling sensation like that produced by the sting of a nettle, and is occasionally followed by slight desquamation of the epidermis.

The varieties of urticaria, distinguished by Willan, are six in number, of which two are referable to the acute, and four to the chronic form of inflammation. The six varieties are,

Acute.	*Chronic.*
Urticaria febrilis,	Urticaria evanida,
" conferta.	" perstans,
	" subcutanea,
	" tuberosa.

URTICARIA FEBRILIS.

Febrile nettle-rash is especiclly characterized by the presence of severe constitutional disorder. It commences with a sense of weight and sickness at the stomach, white furred tongue, quick feverish pulse, pain in the head, anxiety, lassitude, faintness, and drowsiness. On the second day from the invasion of these symptoms, the patient is seized with rigors, which are followed by the eruption upon the skin of irregular patches, of a vivid red color, slightly raised above the level of the surrounding surface, and studded with whitish or reddish elevations and wheals. The patches are dispersed in various situations upon the surface of the body; they appear and disappear unexpectedly, and without order, and may be produced instantly on parts apparently unaffected, by simply rubbing or scratching the skin. They are irregular in size and form, pale and little developed during the day, but brightly red towards the evening and during the night, at which time the febrile symptoms exacerbate, and the itching and tingling become more intense and troublesome.

On the outbreak of the eruption, the pain and sickness at stomach are immediately relieved, but they are disposed to recur at each temporary disappearance of the rash. The disease usually runs its course in about a week; at the end of that period the febrile symptoms and the eruption decline; the bright and vivid red of the patches subsides into a pale and yellowish purple, and speedily disappears, leaving behind it a slight mealy desquamation of the epidermis, and sometimes œdema of the subcutaneous cellular tissue.

Although febrile urticaria may be regarded as a mild form of cutaneous exanthema, yet it is always troublesome and distressing to the patient, from the irritation with which it is accompanied. Frequently it creates alarm by the anxiety about the precordia and the syncope which attend its invasion; and instances are not wanting in which it has proved fatal. "I saw it terminate fatally," says Willan, "in the case of a man about fifty years of age, who had impaired his constitution by hard labor and intemperance. On the first and second day of August, 1792, he complained of nausea, and of great pain in the stomach, which was increased on pressure. He was very thirsty, had a quick pulse, and a slight delirium at night. On the third and fourth days of August, a number of elevated wheals and red patches were diffused over the body, with much heat and itching of the skin. While the rash continued vivid his internal complaints abated, but on its sudden disappearance, about the fifth day, the febrile symptoms and delirium became more violent than at first. On the sixth day the eruption appeared again on his face; he was, notwithstanding, very hot, restless, and delirious; he remained in the same state during the following day, and died in the evening." The same author also relates

a very distressing case of this malady which occurred in a gentlewoman, twenty-seven years of age, and returned at intervals of a week for a considerable length of time.

Febrile urticaria frequently attacks children, particularly during teething, and in them is remarkable for its unexpected development. Dr. Underwood observes that it "occurs in children more generally under two years of age, and is exceedingly troublesome to the infant, as well as matter of surprise to parents, from the suddenness of its appearance. Children going to bed perfectly well, wake very uneasy, and frequently continue screaming for some time before the cause is discovered. But upon examining the body and lower limbs, they are found covered with large wheals, similar to those produced by the sting of nettles." This description corresponds with that of an eruption, afterwards to be described, lichen urticatus, which is peculiar to children.

Urticaria ab ingestis.—The symptoms produced by noxious alimentary substances are very remarkable and severe; and in some instances have proved fatal, particularly when shell-fish have been the cause. The attack comes on suddenly, as, for instance, in the middle of the night, after a hearty supper, or a few hours after the exciting meal. The patient suffers from weight and an uneasy feeling in the stomach, accompanied with nausea and giddiness, and sometimes by vomiting and diarrhœa, a prickling sensation in the throat, and constriction of the fauces, which produces a short, troublesome cough, and occasionally threatens suffocation; the tongue is swollen, and the voice altered from the extension of the swelling of the mucous membrane into the larynx. The face shortly begins to swell, while the ears, nose, and lips are burning hot, and itch violently. By degrees the eruption spreads to the trunk of the body, and from the latter to the limbs, affecting the joints particularly. When the rash reaches the extremities the disagreeable symptoms pass off, and the patient recovers. This kind of attack generally terminates at the end of two days, and sometimes after a few hours, leaving behind it little or no trace of its existence.

URTICARIA CONFERTA.

Urticaria conferta (Plate VII., B) is merely a severe degree of the local affection of urticaria. The elevation of the circular prominences and wheals is not so great as in the preceding variety, but they are more numerous, frequently coalesce, and are attended with considerable inflammation of the surrounding skin. The itching and tingling are exceedingly severe, particularly at night, and the integument is tumid and swollen. This form of the affection is apt to continue for several weeks.

URTICARIA EVANIDA.

Urticaria evanida (Plate VII., A A) is a chronic variety of nettle-rash, appearing and disappearing upon the skin in the form of white roundish prominences and wheals, without febrile symptoms, and with trifling

redness. The eruption is not the less attended with troublesome itching and tingling, particularly on the removal of the dress at bedtime, and on the return of warmth, induced by bed-clothes. It is chiefly remarkable for its duration, lasting sometimes for months, and even for years.

URTICARIA PERSTANS.

Urticaria perstans[1] differs from the preceding only in the persistent character of the eruption, which does not disappear, as in urticaria evanida, but continues unchanged for two or three weeks. It occurs chiefly on the limbs, and not so frequently on the trunk of the body. The gastric disorder, with the itching and tingling under the influence of heat, which are typical of urticaria, are also present in the persistent variety.

URTICARIA SUBCUTANEA.

Under the above title Willan has described a nervous affection of the limbs, accompanied at intervals with an eruption of urticaria. "The eruption," writes Willan, "occurs at distant periods, and continues only a few days at each return, but the patient is harassed during the intervals, as well as during the eruptions, with a violent and almost constant tingling in the skin, and with other distressing symptoms. The complaint is at first confined to one spot on the leg or arm, and commences there with a sensation of tingling or stinging, which is afterwards felt more and more extensively along the limbs, or perhaps over nearly the whole surface of the body. Sudden changes of the temperature of the air, and agitation of mind, occasion increased uneasiness in the skin, so that pains are sometimes felt as from a sharp instrument puncturing in different directions; at other times, as from needles piercing or pushing the skin upwards. There is usually a stiffness and slight torpor in the muscles of the parts most affected; an appearance of wheals takes place on the arms, chest, or lower extremities, from time to time, especially during the summer. In most of the cases that I have seen or known the complaint was partial, affecting only the loins and thighs, or sometimes the arms." In illustration of this disease, Willan records the case of a lady, which appears rather to resemble a chronic affection of the spinal cord, attended occasionally with the eruption of urticaria. Stinging and pricking in the integument is a common symptom in diseases of the nervous system, but this surely affords no grounds for the designation *subcutanea*, as applied to this variety.

URTICARIA TUBEROSA.

Urticaria tuberosa appears chiefly in debilitated constitutions, and is a rare form of cutaneous disease. It has received its name from being characterized by the production of elevations of considerable size, and extending deeply into the subcutaneous cellular tissue.

[1] Portraits of Diseases of the Skin, Plate I., L.

These tumors are developed with much itching, during the night, upon the arms and legs; they are painful and hot, and disappear before the morning, "leaving the patient weak, languid, and sore, as if he had been bruised, or had undergone much fatigue." The disease "often proves tedious and obstinate; I have known it continue," says Willan, "upwards of two years, with a few short intervals. The only causes to which it could, with probability, be attributed in the instances presented to me were, irregularities in diet, violent exercise taken by persons usually sedentary, and the too free use of spirituous liquors."

Dr. Day, in his translation of *Simon's Animal Chemistry*, observes: "The urine in a case of urticaria tuberosa, has been analyzed by Scherer. The patient was a young man, who likewise suffered from rheumatism. The urine was discharged in very small quantity, often not more than five or six ounces in forty-eight hours. It was clear, of a brownish-red color, very acid, and its specific gravity was 1028. It contained in 1000 parts—

Water,	931.58
Solid residue,	68.42
Urea,	30.46
Uric acid,	0.74
Alcohol extract, with much lactic acid,	21.24
Water extract,	4.92
Alkaline salts,	8.03
Earthy phosphates,	2.02

The most remarkable points in the constitution of the urine are the large amount of earthy phosphates, and the excess of free acid."

In a case of urticaria, in which the urine was analyzed by Dr. Maclagan, its composition was found to be as follows:

Urea,	6.91
Uric acid,	0.05
Inorganic salts,	12.03
Organic matters and water,	981.01

"The chief peculiarity in the present case was a deficiency in the ordinary characteristic ingredients of the urine, the urea and uric acid. This could not arise from mere excess of water: first, because the urine was not excessive in quantity; second, because the inorganic salts were above the normal standard, whereas, had the water merely been in excess, they, too, ought to have indicated a diluted condition of the urine. Dr. Maclagan ventured, therefore, to propose, as the pathological view of the case, that the defect here was merely a deficiency of the urea and uric acid; in short, a want of what modern chemists call the products of transformation of the tissues, and that the retention in this way in the system of matters which ought to be eliminated from it might be the cause of this cutaneous irritation, especially occurring, as it did, after meals."[1]

With the view of modifying the imperfect transformation of tissues here referred to, the patient was treated with colchicum, upon which

[1] Edinburgh Monthly Journal.

the specific gravity of the urine was found to have risen to 1029.9, and its composition to be as follows:

Urea,	20.36
Uric acid,	0.50
Inorganic salts,	12.72
Organic matter and water,	966.42

The conclusions deduced from this observation are:

1. "That urticaria is intimately connected with a deficiency of the organic salts of the urine, and their probable retention in the system.

2. "That colchicum has an action capable of restoring the deficient salts, and thus curing the disease.

3. "Rheumatism and urticaria, and purpura and urticaria, are frequently found to be present together. They are also benefited by the use of colchicum. It may be safely asked, do they not depend on the same common cause, namely, the presence of those salts in the blood? Such an inference has been applied in the case of rheumatism."[1]

DIAGNOSIS.—The diagnostic characters of urticaria are, *firstly*, the appearance of the eruption, which resembles the whitish elevated spots and wheals produced by nettles; *secondly*, the itching, tingling, and pricking, which accompany the eruption; *thirdly*, the evanescent and fleeting habits of the eruption; and *fourthly*, its association with symptoms of gastric irritation. These characters, well appreciated, sufficiently distinguish it from every other cutaneous eruption.

The only affections to which urticaria bears so close a resemblance as to deserve remark, are, lichen urticatus, and erythema papulatum, tuberosum, and nodosum. The pimples of lichen urticatus are, however, smaller and more persistent than the wheals of urticaria; they appear in successive crops, and become surmounted by a small dark-colored scab. Erythema papulatum resembles urticaria, both in general and local symptoms, but differs in its course and persistency. The spots of erythema tuberosum are quite superficial and persistent, as are those of erythema nodosum; characters which distinguish these eruptions from that of the transient and quickly fading urticaria tuberosa.

Urticaria is occasionally complicated by the presence of other diseases of the skin, as erythema, roseola, lichen, and impetigo. It has also been observed with rubeola, variola, and prurigo.

CAUSES.—The proximate cause of urticaria is an irritation of the nerves of the skin, giving rise to the peculiar prickling and tingling sensation, and exciting spasm of the muscular structure of the corium; hence the white buttons and wheals emptied of their blood by muscular contraction, and developed on a surface reddened by vascular congestion; hence, also, the gradual subsidence of the wheals, the recovery of the natural tint of the skin, and their sudden reproduction on the recurrence of slight irritation. In the instance of the rash occasioned by the sting of a nettle, the poisonous juices of the plant act directly on the nerves of the skin. In the

[1] Lancet, vol. ii. 1846, p. 160.

case of urticaria excited by poisonous food, the action is an excito-sensory reflex operation, the seat of primary irritation being the nerves of the stomach; while in other examples of the disease the primary irritation may exist in any organ supplied with sympathetic nerves; in a word, urticaria is a neuropathic affection, as distinguished from erythema and roseola, which are hæmopathic disorders. This view of the pathology of urticaria explains its association with other eruptions of hæmopathic origin; indeed, it is matter for surprise, that a spasmodic state of the muscular structure of the skin so rarely accompanies its inflammation in other diseases.

The exciting causes of urticaria are referable to irritation of the gastro-pulmonary and genito-urinary mucous membranes. Thus it is induced by dentition, by gastric irritation, by intestinal irritation, by uterine irritation, and, more rarely, by pulmonary irritation. Mental excitement or anxiety, fatigue, exposure to cold or heat, also contribute towards its development, and occasionally it is seen in association with rheumatism. Among the causes of urticaria, nervous debility, occasioning a peculiar susceptibility of the cutaneous nerves, must not be omitted. In a lady who was lately under my care, I have watched the red wheals appear and creep along the skin and disappear, while I purposely engaged her in conversation on indifferent subjects. A word, a look, the slightest excitement, would immediately bring out a copious eruption. It occurs chiefly in the summer season, and is said to be more prevalent in cold climates, as that of Russia, than in those of the south. Persons who possess a thin and irritable skin, who are plethoric and of a sanguine temperament, are most liable to the disease, and for this reason it is more common in the female than in the male sex. It is frequent in children, particularly during the period of dentition.

The alimentary substances which are capable of exciting urticaria, act upon the system by means of the irritation which they cause to the mucous membrane of the alimentary canal. In some instances this irritation is referable to the natural susceptibility of the individual; while in others, the probable cause is a poison generated by putrefactive decomposition. The substances which have been observed to give rise to these effects in different persons are very numerous; they are—some kinds of fish, as mussels, lobsters, crabs, prawns, shrimps, oysters, dried fish, &c.; certain meats, such as pork, goose, &c.; certain fruits and vegetables, as rice, almonds, strawberries, raspberries, cucumbers, mushrooms, &c. Rayer mentions oatmeal gruel, as occasionally producing this effect; and certain medicines, as valerian, copaiba, &c. A member of my own family suffers, constantly, after taking rice milk. Dr. Gregory was affected by the disease after eating part of a cucumber; and he mentions two instances, of persons attacked in a similar manner from drinking porter. Dr. Winterbottom was "twice violently affected, by eating the sweet almond." Urticaria has been observed occasionally as a critical eruption, and has been stated by some authors to have occurred epidemically.

Persons of great cutaneous susceptibility have the power of exciting the eruption at any time, by merely scratching the skin.

PROGNOSIS.—Urticaria is not, in itself, a dangerous disease. The acute form is easily removed by appropriate treatment. Chronic urticaria is frequently symptomatic of nervous debility, mucous irritation, or visceral disorder, and may consequently prove obstinate, resisting all therapeutic measures until the disease of which it is a dependence is relieved. Retrocession of this eruption has sometimes been followed by a serious aggravation of internal disease.

TREATMENT.—The treatment of febrile urticaria should be strictly antiphlogistic; in some cases it may be advisable to deplete by general bleeding; in others, abstraction of blood from the neighborhood of the organs especially affected, by means of leeches, may suffice. The rest of the treatment should consist in the administration of aperients, salines, maintaining an abstemious and cooling diet, using the tepid bath and foot-bath occasionally, and if the seat of the visceral disorder be apparent, applying a blister over the organ affected. During convalescence, if the powers of the system have been reduced, tonic medicines, combined with alkalies or acids, according to the stage of the affection, should be prescribed.

Where difficult dentition is the cause of eruption, the gums must be laid freely open with the lancet; the little patient should be immersed once or twice daily in a warm bath, and some gentle antacid aperient administered.

When the cause of the eruption is the ingestion of noxious and indigestible substances, no time should be lost in obtaining the ejection of the offending matters. For this purpose the sulphate of zinc or sulphate of copper is best suited; or if these be objected to, the ordinary emetic of ipecacuanha, either alone or combined with tartarized antimony. Willan cautions us to avoid the latter salt, from its liability to operate too violently, and give rise to faintings. The employment of the emetic should be followed by a dose of castor-oil, or some simple cathartic; and Plumbe recommends from twenty to forty drops of ether, to be given every half hour.

Chronic urticaria calls for the use of aperients, counter-irritants, tonics, warm and cold baths, particularly the sponge bath and shower bath, careful attention to regimen, and the avoidance of all indigestible substances. I have derived the greatest amount of success in the treatment of chronic urticaria from the use of warm aloetic purgatives, combined with the citrate of iron or nitro-muriatic acid in a bitter infusion or tincture, and afterwards followed by arsenic. The influence of dietetic substances was shown in the fact that, in one patient sugar was excommunicated with advantage, and in the same case great benefit was derived from the citrate of iron, at first combined with the hydriodate of potash, and subsequently with quinine. In another case, the infusion of serpentaria with carbonate of magnesia and carbonate of ammonia was completely successful. In a third, a course of sulphate of magnesia in drachm-doses, combined with carbonate of magnesia and iodide of potassium, cured the patient after

other means had failed; and in a fourth, five minims of the tincture of colchicum were usefully substituted for the iodide. I have also derived advantage from bismuth and from the oxide of silver; the latter in one-grain doses a quarter of an hour before meals. Urticaria tuberosa is often so severe as to require depletion by venesection, and active antiphlogistic measures. Whenever urticaria assumes an intermittent form, it must be treated with bark or quinine, like ordinary intermittent fever.

The intense itching and tingling which frequently accompany urticaria are best relieved by means of narcotics. Locally the linimentum saponis, with chloroform and laudanum, two drachms of each to the four ounces, is a valuable application. Acetous and alcoholic lotions, and lemon-juice, are sometimes useful for a similar purpose; and a lotion composed of carbonate of ammonia and acetate of lead, of each a drachm, combined with eight ounces of rose-water, has been recommended. I have found a lotion of chlorate of potash sometimes succeed in quelling the pruritus of this and other eruptions; but that upon which I chiefly rely is one composed of bichloride of mercury, from five to ten grains, spirit of rosemary and spirit of wine of each an ounce, and six ounces of the emulsion of bitter almonds.

If the eruption show a disposition to recede, or if it have already receded, blisters should be applied to the skin; or the surface well rubbed with some stimulating liniment, such as that of croton oil, in order to restore the eruption, or set up an equivalent action in the skin.

CHAPTER VI.

DISEASES ARISING FROM GENERAL CAUSES.

LICHENOUS OR PAPULOUS ERUPTIONS.

In the present group of cutaneous affections, Lichen is taken as the typical form, just as Erythema is made to constitute the type of the preceding group. This group corresponds with the order Papulæ of Willan, and the genus Exormia of Mason Good. It includes three affections, namely,

Lichen. Strophulus. Prurigo.

Rayer and Gibert remark that the above number might very properly be reduced to two; for that strophulus is nothing more than the lichen of young children and infants, while Alibert considers the whole under the single genus Prurigo.

The definition given by Willan of the elementary form of papular affections admits of no improvement. A papula or pimple is "a very small and acuminated elevation of the cuticle, with an inflamed base, very seldom containing a fluid, or suppurating, and commonly termi-

nating in scurf." Papulæ terminate by resolution, generally with furfuraceous desquamation of the epidermis. The papulæ of strophulus have usually a greater elevation than those of lichen and prurigo. Some differences are perceived also in relation to color; thus, the pimples of strophulus may be either red or pale, those of lichen are always more or less red and inflamed, while the papulæ of prurigo scarcely differ in tint from the surrounding skin.

The seat of morbid action in the lichenous eruption is the vascular boundary of the various excretory tubules of the skin; for example, the sudoriferous and sebiferous ducts, and hair-follicles. In this fact we have an explanation of various of the phenomena which accompany the eruption; for example, the frequent perforation of the pimples by a hair, the formation of a thin scale upon the summit of the papule, the occasional appearance of a minute aperture in this situation, and the oozing of a transparent and colorless fluid from the same point. We can also better understand the provoking itching which is a symptom of the eruption, the obstruction which is offered to the escape of secretions, and the obstinacy of these disorders. The papulæ of prurigo are perfectly identical with the papulæ of lichen, the difference between them being, that the latter are generally acute in their course, while the former are always chronic. But there is an appearance of the skin in prurigo that must be familiar to all who are conversant with cutaneous diseases; an unevenness of surface, produced by numberless slight but broad elevations, separated from each other by the linear markings of the skin. These are the elevations which have been described by all dermatologists under the name of the broad and flat papulæ of prurigo. "Soft and smooth papulæ, somewhat larger and less acuminated than those of lichen, and seldom appearing red or inflamed, except from violent friction. Hence an inattentive observer may overlook the papulæ altogether."[1] Rayer speaks of them as being "soft to the touch, and broader than those of lichen, from which they also differ in preserving the natural color of the skin." "They occasionally project in so slight a degree that they appear to be situated rather in the substance than on the surface of the skin." Now there is an evident obscurity about these descriptions, a contradiction, in fact, which must have involved many in perplexity with regard to the real meaning of the authors. Papulæ, precisely defined, broad, soft, smooth, and large, and yet not distinguishable in color from the adjacent skin, easily overlooked, and suggesting to the practised eye some uncertainty as to whether they were *in* or *upon* the skin. I will endeavor to explain the difficulty.

As a consequence of the altered nutrition and innervation of the skin which accompany prurigo, the dermal tissues become changed in structure, namely, condensed and thickened. The most careless examination is sufficient to establish these two points; the skin feels hard, it moves like a piece of thick leather; the areæ included between the lines of motion are large; its natural suppleness is gone; its very color is changed; it looks yellowish and dirty. But it is smooth;

[1] Bateman, Synopsis, third edition, p. 15.

there are no such projections as we should call pimples, or if there be, they are few and scattered. Arrived at this point, there remains but one conclusion for the student. There are no papulæ, therefore the disorder cannot be prurigo. And yet the disease is so characteristically prurigo, that, setting aside the symptom of pruritus, the dermatologist is enabled to decide at once upon its name.

What, then, are the signs by which prurigo is so immediately distinguished? They are the thickening and condensation of the skin, and the consequences of this condition. Upon close examination, the angular areæ included by the linear markings of the skin are seen to be raised above their natural level, the elevation being occasioned by the thickening of the derma. That this is the case is evident from the position of the pores, namely, in the furrows which constitute the linear marking, and at the point of divergence of several of these. The elevations, therefore, are simply the effect of a swollen state of the derma, the areæ being magnified by hypertrophy, and the linear markings being magnified in depth by the same cause. These swollen areæ are the so-called papulæ, the broad, and flat, and smooth papulæ. It is not, then, to be wondered at, that they should be with difficulty discerned, that they should be "overlooked," seeing, as I have shown, that they are not papulæ at all.

But we do meet with papulæ in prurigo, although not a necessary feature of that disease. These papulæ are not the areæ of the linear markings of the skin; they occupy the grooves of the linear markings. They are, in fact, the pores raised into pimples, and are identical with the pimples of lichen. It is these latter which generally suffer abrasion of their tips from scratching, and then become surmounted by a small, dark-colored scab.

LICHEN.

Syn. *Exormia lichen*, Mason Good. *Lichenous rash.*

Lichen (Plate XI.) is an eruption of minute conical papulæ distributed upon a single region, or over the entire surface of the body. The pimples are comparable in size to millet seeds; they are reddish in color, or scarcely different from the natural hue of the skin, and are attended with itching, tingling, and smarting. They are usually developed in clusters, and appear in single or successive eruptions. They are non-contagious, and terminate in resolution and furfuraceous desquamation, sometimes in superficial ulceration.

The appearance, situation, form, and severity of the disease, have given rise to its division into nine described varieties, which may with advantage be reduced to six, the other three, namely, lichen lividus, lichen pilaris, and lichen gyratus, being mere modifications of varieties. The six which remain are:

Lichen simplex.
" annulatus.
" circumscriptus.
Lichen urticatus.
" tropicus.
" agrius.

LICHEN SIMPLEX.

In the simple form of lichen (Plate XI., A), the pimples are distributed irregularly over the surface affected, forming little patches from point to point, in which the papulæ are more numerously assembled than in neighboring parts. Simple lichen is usually a chronic disorder, but occasionally presents itself in an acute form. The acute variety is preceded and accompanied by febrile symptoms, which are referable to the disordered state of the system, and are relieved by the outbreak of the eruption.

In the acute form of lichen,[1] the eruption is ushered in by some degree of smarting and pruritus, which are increased towards night; the papulæ are red and inflamed, and continue hot and itchy for several days. In the course of three or four days the redness begins to subside, the pruritus diminishes, and the papulæ decline; vanishing altogether at the end of a week or ten days, and being succeeded by furfuraceous desquamation of the epidermis.

In the chronic form of the disorder the papulæ are less red and inflamed. Individually, they run the same course of about a week or ten days, but being followed by successive crops, the eruption is prolonged for several months, and even years. By the continuance of irritation the skin becomes thickened, and throws off a copious furfuraceous desquamation, which is especially abundant in the flexures of joints.

Willan remarked some modification in the appearance of the papulæ according to the region in which they are developed. Thus on the face, papulæ are large and rounded in form; on the neck, trunk, and limbs, they are small, more vivid in color, and acuminated, and on the hands they are somewhat paler than in other situations.

The ordinary seat of the acute variety of lichen simplex is the face and trunk of the body. The chronic form of the disease appears to attack by preference the backs of the hands, fore-arms, and arms; and on the lower limbs, the hams and ankles.

Lichen simplex has received the name of LICHEN LIVIDUS, when, from its occurrence in persons of weakly and debilitated constitution, or in those who are ill-fed, badly clothed, and live in unhealthy and confined situations, the pimples have a bluish and livid appearance. It is commonly met with among the squalid inmates of our workhouses at the period of admission, and is unaccompanied with constitutional disturbance. The papulæ of lichen lividus are soft and somewhat flattened, they have a purplish red or livid hue, are of longer continuance than those of simple lichen, and are developed on the arms and legs, but chiefly on the latter. Not unfrequently they are intermingled with petechiæ, and small purple blotches and ecchymoses. The eruption is frequently prolonged by successive eruptions for several months.

[1] Portraits of Diseases of the Skin, Plate IX., Q. This case is curious from being so exactly limited in extent by a woollen vest which the patient wore. The clustered or corymbose distribution of the pimples on the arms is also interesting.

LICHEN PILARIS (Plate XI., B) is a term which is applied to lichen simplex, when the pimples are developed around the mouths of the pores by which the hairs issue from the skin. They are red and inflamed, extend deeply into the follicle, give rise to much tingling and itching, and are chronic in their course. The pimples usually decline at the end of a week or ten days, and terminate by furfuraceous desquamation of the epidermis, but are sometimes prolonged by successive eruptions to several months or years. This form of lichen occurs in persons of unsound and irritable constitution, and is frequently coincident with disorder of the stomach and bowels, and the abuse of spirituous drinks.

LICHEN ANNULATUS.

Syn. *Lichen annulatus solitarius. Lichen annulatus serpiginosus. Erythema marginatum*, Bateman. *Lichen marginatus. Lichen gyratus*, Biett.

There is a variety of lichen, in which the disease commences as a mere spot, and increases rapidly in size until it forms a distinct ring. There is generally but one such ring on the whole body; and the eruption may therefore be properly designated *lichen annulatus solitarius*.[1] The existence on the same person of more than two or three of these rings, is an exceptional occurrence. It is an eruption more frequently met with in women and children than among men, and the ring, after attaining a certain size, remains stationary, for two, three, or four weeks, and then disappears. The boundary ring in lichen annulatus presents some variety in point of elevation and degree of papulation. Sometimes the elevation is so trifling as scarcely to be perceptible; at other times it is strongly marked; usually the ring is formed by a line of well-developed papules, sometimes a double row, while often it is an almost uniform ridge. The want of clear definition of the papules, and the appearance of the area of the ring, which is yellowish and mealy, have caused it to be described under the name of erythema (Plate VII., L), but its proper place is the present group.

The ring in lichen annulatus is of a lightish red color, with here and there a more vivid tint, from the presence of a papule of a brighter hue than the rest. The area presents a yellowish tint, and is covered with a mealy scurf; it is for the most part uniform, but occasionally has a few papules sprinkled on its surface, and sometimes includes a series of two or three concentric papular rings. (Plate VII., M.) Lichen annulatus solitarius is frequently associated with trichosis furfuracea, or common ringworm, and is, in fact, the ringworm of the hairless skin. But it is also found where no ringworm of the scalp is present.

LICHEN ANNULATUS SERPIGINOSUS[2] is another form of the annulate

[1] Portraits of Diseases of the Skin, Plate XI., AI. In this plate several varieties of eruption are shown. This eruption is not unfrequently associated with common ringworm, and is, in fact, the so-called "ringworm of the body."

[2] Portraits of Diseases of the Skin, Plate X., AD.

variety of lichen; its special characters being, the development of rings in considerable numbers, generally upon the breast or back; and the rapid spreading of the rings, so that they run together, and form one broad and extensive patch, upon and around which the more or less complete or interrupted markings of its component circles may be traced. This eruption is attended with very considerable itching, is chronic in its nature, and is succeeded by a mealy exfoliation of the epidermis.

The eruption commences by lichenous pimples, which, subsiding at the summit and spreading at the base, are speedily converted into small, flat, erythematous disks, bounded by a sharp and distinct margin. These disks, about half an inch in diameter, throw up at their edges, at one, two, or three points, several bright red pimples, and, increasing in size to the diameter of one or two inches, are converted into rings. When the centrifugal growth is equally active on all sides, the ring remains circular, and the margin is formed by a row of pimples more or less complete; sometimes the row of pimples is broken at several points, sometimes they are ranged only on one side of the circle, and at other times they are entirely absent, and the margin is formed by a simple ridge, along the summit of which the cuticle has become fissured (erythema marginatum). Bateman observes, that "the erythema marginatum occurs in patches, which are bounded on one side by a hard, elevated, tortuous red border, in some places obscurely papulated; but the redness has no regular boundary on the open side." When the pimples are developed only on one side of the circle, so as to form a crescentic rim, the ring is apt to increase chiefly by this side, and becomes more or less oblong; and when the pimples constitute several broken rows, the ring is still more irregular. Increasing in this way, and by a portion only of the periphery of the ring, the rest of the ring is apt to be lost, and then only a portion of the margin remaining, the title of *lichen marginatus* is not inapplicable. Or, when portions of several circles are more or less connected with each other, so as to form an uneven line of some extent, we find an explanation of the term *lichen gyratus*, assigned by Biett to a narrow, tortuous band composed of lichenous papules.

The area of the rings has a yellowish tint of color, and the cuticle covering it is slightly corrugated and dry, and sometimes the seat of a mealy exfoliation. In other respects, the area is uniform and smooth, and rarely presents any trace of pimples. Along the line of the margin, on both sides of the base of the papular ridge, the cuticle is commonly broken, and presents a thin, free edge.

LICHEN CIRCUMSCRIPTUS.

Clustering lichen.

Lichen circumscriptus (Plate XI., E F) differs from lichen simplex only in the mode of aggregation of the pimples. They are collected into one or several patches, of a circular or oval form, and bounded by a well-defined margin, consisting generally of the largest and most inflamed papulæ. The patches in the first instance appear as small

aggregated clusters, which progressively increase by their circumference, while they exhibit a tendency to fade in the centre, and form rings of variable size. In the latter case, the boundary of the ring maintains a certain breadth, and forms a kind of ribbon or belt around the included area, in which a greater or less number of pimples continue to be developed.

When the ribbon or belt is broken in its circle, or parts of several circles are irregularly connected together, we have the variety described by Biett under the name of *lichen gyratus*, which consists in the aggregation of the papulæ into one or several narrow and tortuous bands of variable length. Cazenave and Schedel observe, "We have lately seen an instance of this disease in the hospital Saint Louis; the papulæ collected into little groups, formed a kind of ribbon, which, commencing on the front of the chest, curved downwards along the inner border of the arm, and continued onwards, precisely in the direction of the course of the ulnar nerve, to the little finger." Rayer remarks, that he has seen it form "a kind of collar in front of the neck, extending from one ear across to the other."

LICHEN URTICATUS.

Lichen urticosus, Mason Good.

In lichen urticatus (Plate XI., D), a variety described by Bateman, the papulæ are of a larger size than in other forms of the disease. They are inflamed and prominent, and resemble, at their first appearance, the bite of a gnat or bug. They generally show themselves suddenly, and disappear, unless irritated by scratching, in the course of a day. More frequently, however, from the burning heat and pungent itching which attend them, they are scratched and bleed, and a small black crust is formed upon their summits. The disease seems to be peculiar to children, and is remarkable for its obstinacy. The following case is an illustration of this disorder:

A little girl, three years and a half old, delicate, but healthful in her functions, has been subject to an eruption, attended with itching, since the age of ten months. In January, 1846, she had measles, and since that period the attacks of the cutaneous disorder have been more frequent. The eruption shows itself in the form of large red pimples, generally isolated, but frequently in clusters, particularly on the face, neck, and shoulders. The pimples are excited by warmth; for example, by the warmth of bed, so that she is sometimes awakened in the night by the itching. They are also excited by mental emotion; thus, if she be scolded, the itching begins; and, to use her mother's expression, she can at all times "rub them up wherever she likes." When left to themselves, the pimples subside in the course of twenty-four hours; but when scratched, a little blood oozes from their summits, and desiccates into a small black scab. On some of the pimples a little pus forms at the points; and on the soles of her feet they run into a vesicular form. Each pimple, when it does not subside at once, continues for about a fortnight; but as fresh ones are continually

appearing, the eruption has now been prolonged without amendment for three months.

Such was the state of the case when I first saw her. I prescribed for her citrate of iron, with hydriodate of potash, and a lotion of bichloride of mercury in an emulsion of bitter almonds, five grains to the half pint. The lotion relieved the itching, but the eruption continued unchanged, although the child was obviously improved in health. I then had recourse to quinine, with nitric acid; but finding no amendment at the end of another fortnight, I prescribed for her one grain of chloride of mercury, with two of nitrate of potash, twice in the day. Nothing, however, seemed to produce an impression on the disease, and I was glad to avail myself of an opportunity of sending her into the country, to try the effect of change of air.

LICHEN TROPICUS.

Syn. *Essera*, *Eshera*, Arabic. *Summer rash.*

Lichen tropicus, or prickly heat, is the usual form of this eruption when it occurs in warm climates. Willan gives an excellent description of the disease, in a communication by Dr. Winterbottom. From this account the following passages are selected:

"The prickly heat appears without any preceding disorder of the constitution. It consists of numerous papulæ, about the size of a small pin's head, and elevated so as to produce a considerable roughness of the skin. The papulæ are of a vivid red color, and often exhibit an irregular form, two or three of them being in many places united together, but no redness or inflammation extends to the skin in the interstices of the papulæ."

"The eruption is diffused over those parts of the body which are usually covered, as the neck, breast, arms, legs, and inside the thighs. It does not often appear on the face, excepting on the upper part of the forehead, contiguous to the hair: neither is it ever found in the palms of the hands, soles of the feet, nor on the hairy scalp. The number of the papulæ is much increased by wearing flannel, or clothes too warm and thick for the climate. When perspiration is very copious, small vesicles containing a limpid humor are often intermingled with the prickly heat, more especially on the breast and about the wrists; but they terminate in scales, having no disposition to ulcerate, though violently scratched. A troublesome itching attends the prickly heat, and prevents sleep during the night. There is likewise a frequent sensation of pricking, as if a number of pins were piercing the skin. This often takes place suddenly after drinking a dish of tea, or any warm liquor, so as to cause the person affected to start from his seat. The eruption is in general stationary, and appears equally vivid in the day and in the night. It does not leave one part and arise on another, unless the former be much exposed to cold, and the latter be heated by additional clothing, or by friction. An increase of heat, indeed, in all cases, produces a greater number of papulæ. They sometimes disappear on a sudden, and return again as suddenly, without any obvious cause; but whenever

the eruption continues for a length of time, the papulæ throw off minute scales, and are succeeded by a fresh crop, no vestiges being left in the skin. The prickly heat is in general considered as a salutary eruption, whence we are cautioned not to repel it from the skin by cold or other external applications. Such a repulsion cannot, however, be easily effected; it is certainly not produced by bathing, which has been hitherto thought highly prejudicial. A vivid eruption of the prickly heat is a proof that the person affected with it is in a good state of health, although its absence does not always indicate the contrary. The sudden disappearance of it which frequently happens, is rather an effect than a cause of internal disorder, as of fever, or of any slight complaint of the stomach; in the latter case, a temporary stimulus, applied to the stomach, as by spirits, tea, or other warm liquids, has the power of restoring the eruption. Its appearance on the skin of persons in a state of convalescence from fevers, &c., is always a favorable sign, indicating the return of health and of vigor."

"Various means have been employed to alleviate the itching and tingling of the prickly heat; the favorite remedy at Sierra Leone is the juice of limes rubbed on the skin, which, however, has no considerable effect. I have found it of most advantage to use a light, cool dress, and to avoid the drinking of warm liquors."

Dr. James Johnson, who was a sufferer from the prickly heat, gives the following animated description of the disorder: "This unwelcome guest assails us at all, and particularly the most unseasonable hours. Many a time have I been forced to spring from table, and abandon the repast which I had scarcely touched, to writhe about in the open air for a quarter of an hour; and often have I returned to the charge with no better success against my ignoble opponent. The night affords no asylum. For some weeks after arriving in India I seldom could obtain more than an hour's sleep at one time, before I was compelled to quit my couch with no small precipitation, and if there were any water at hand, to sluice it over me, for the purpose of allaying the inexpressible irritation. But this was productive of temporary relief only, and what was worse, a more violent paroxysm frequently succeeded."

"The sensations arising from prickly heat are perfectly indescribable, being compounded of pricking, itching, tingling, and many other feelings for which I have no appropriate appellation."

"It is usually, but not invariably, accompanied by an eruption of vivid red pimples, not larger in general than a pin's head, which spread over the breast, arms, thighs, neck, and occasionally along the forehead. This eruption often disappears in a great measure when we are sitting quiet, and the skin is cool, but no sooner do we use any exercise that brings out a perspiration, or swallow any warm or stimulating fluid, such as tea, soup, or wine, than the pimples become elevated, so as to be distinctly seen, and but too sensibly felt."

In reference to the imagined dangers of repelling this eruption, Dr. Johnson continues: "Indeed, I never saw it even repelled by the cold bath; and in my own case, as well as in many others, it seemed rather to aggravate the eruption and disagreeable sensations, especially during

the glow which succeeded immersion. It certainly disappears suddenly sometimes on the accession of other diseases, but I never had reason to suppose that its disappearance occasioned them. I have tried lime-juice, hair-powder, and a variety of external applications, with little or no benefit; in short, the only means which I ever saw productive of any good effect in mitigating its violence, till the constitution got assimilated to the climate, were light clothing, temperance in eating and drinking, avoiding all exercise in the heat of the day, open bowels, and last, not least, a determined resolution to resist with stoical apathy its first attacks. To sit quiet and unmoved under its pressure is undoubtedly no easy task; but if we can only muster up fortitude enough to bear with patience the first few minutes of the assault without being roused into motion, the enemy, like the foiled tiger, will generally sneak, and leave us victorious for the time."

The author very truly observes, that an affection similar to lichen tropicus is sometimes seen during the summer season in this country. I have myself suffered from its annoying attack on one or two occasions, and can add my testimony to that of Dr. Johnson.

LICHEN AGRIUS.

Syn. *Lichen eczematosus, vel ichorosus.* *Lichen ferus.* *Agria*, Græcorum.

Lichen agrius (Plate XI., G H) is the most intense, and when extensive, a very severe form of lichenous disease; the papulæ are acuminated and prominent, of a vivid red color, and numerous; they are aggregated into clusters of irregular form and size, are attended with much heat, smarting, and itching, by a painful sensation of tension, and are surrounded by considerable inflammation.

These symptoms continue to increase for several days, when the less inflamed papulæ diminish in redness, and become covered with a furfuraceous desquamation. The more inflamed papulæ, however, and especially those which are collected into clusters, have their points torn off by friction or scratching, and form small superficial abrasions, which pour forth an ichorous or sero-purulent fluid, and this secretion desiccates into thin yellowish crusts. The skin around the papulæ is at the same time thickened by the continuance of the inflammation, and fissured by deep cracks, from which a copious watery secretion exudes. In milder cases the disease subsides before reaching this extreme, the redness and painful symptoms diminish, and the eruption dies away in two or three weeks.

In the severe form, as soon as the crust falls off and desquamation occurs, new papulæ are developed, which pursue the same course as their predecessors, and the disease is prolonged to several weeks, or months; at other times, the eruption appears and disappears several times in succession before a cure is accomplished.

More commonly, the eruption is of chronic origin; it begins as a small patch of irritable pimples, say on the back of the hand; these pimples are very irritable, they are rubbed or scratched, and next day more pimples are developed. This process may go on for several

weeks, the pimples sometimes glowing and sometimes fading; until, without any apparent cause, the patch suddenly becomes as large as a half-crown piece, and establishes itself as a permanent eruption.

Lichen agrius is generally partial in its eruption, being confined to one or more regions. It is most frequently seen upon the arms, the hands, the shoulders, the loins, the legs, as also upon the chest and face. On the backs of the hands it constitutes the bricklayer's, grocer's, baker's, and washerwoman's itch of Willan and Bateman.[1] The itching and smarting are sometimes intolerable, generally periodic, and much aggravated towards the evening, or by the warmth of bed,[2] exercise, stimulating food, and drink, &c. Occasionally the papulæ are intermingled with small vesicles or pustules, which speedily burst, and terminate by desquamation.

The eruption very commonly takes place without any constitutional symptoms; or, if such be present, they have no special reference to the invasion of the disorder. Generally they are only of a kind indicating dyspepsia, such as acidity and flatulence, with a sense of heaviness and debility; sometimes accompanied with neuralgic, rheumatic, or gouty pains. At other times the constitutional symptoms are more severe: for example, rigors, flushes of heat, lassitude, pains in the limbs, headache, nausea, pain at the epigastrium, white, furred tongue, and quick pulse. These symptoms make their invasion for several days previously to the appearance of the cutaneous affection, and are, for the most part, relieved by its eruption. When the disease has been suddenly checked, some visceral derangement has generally taken its place.

Diagnosis.—The diagnostic characters of lichen are, its solid and prominent pimples, the coloration of these pimples, and their attendant itching, which is of the tingling kind. The diseases with which it may be confounded, are the pruriginous affections: prurigo, scabies, and eczema. In prurigo, however, the papulæ are paler than those of lichen, and there is a general unhealthiness of appearance, and oftentimes a disorganization of the skin. The little black scabs which surmount the papulæ of prurigo when torn by the nails, and the scratches by which the skin is marked, must also be borne in mind. Scabies resembles lichen only in the presence of itching, but this is different in its character; moreover, it may be remarked, that lichen selects by preference those parts of the body in which the derma is thickest, as the back, the face, and the outer sides of the limbs, whilst the regions furnished with the thinnest skin are those affected by scabies. Eczema, it will be recollected, is a vesicular or ichorous eruption, and therefore distinct from the solid, dry papulæ of the disease under consideration. When the points of the papulæ of lichen are torn off, the crusts which succeed are thinner and more scale-like than those of eczema.

[1] Portraits of Diseases of the Skin; Plate XII., G., represents a case of Lichen agrius dorsi manûs.

[2] Plumbe remarks, that the parts smart for an hour or more, as if they "had been severely scalded."

Lichen circumscriptus bears some resemblance in the form of the patch to erythema circinatum, erythema marginatum, and herpes circinatus, but from these the diagnosis is by no means difficult. In erythema circinatum, the surface is smooth; in erythema marginatum, although raised and papulated, there are no scattered papulæ in the neighborhood of the patch; while in herpes there are vesicles, or their detrita, and a greater degree of redness.

Lichen urticatus differs from urticaria in the irregularity of form and size of the papulæ, their greater redness and chronic character; and from erythema papulatum, by the small and irregular patches of the latter being merely papuloid, by their inferior degree of redness, and by the comparative absence of pruritus.

Lichen agrius is especially characterized by the close aggregation and highly inflamed state of the pimples, by the severe smarting and tingling, by scaly crusts, the superficial excoriations, the fissures and chaps which so frequently form, and by the thickening and condensation of the integument.

Causes.—Lichen occurs in persons of every temperament, and at all periods of life. It is most frequently observed in the spring and summer season, and especially in the latter. Increased temperature appears to have a certain influence in producing the disease, as we see evinced in lichen tropicus, or prickly heat; for the same reason the eruption is met with on the arms and face of persons employed near the fire, as of cooks and smiths. Local irritation is not unfrequently an exciting cause, in persons of irritable skin, from the use of flannel or woollen raiment, or coarse body linen. Other exciting causes are, depressing moral or physical conditions, excessive fatigue, irregularities of diet, intemperate habits, &c. Sometimes it appears critically in fevers, and in acute or chronic visceral affections.

Lichen agrius would seem to be most frequent in elderly persons, females, and young persons of sanguine or nervous temperament. It is usually referable to fatigue, anxiety, or dyspepsia, and is a frequent accompaniment of the rheumatic and gouty diathesis. But the most troublesome cases of lichen agrius with which I have had to contend, have occurred upon the legs of men who had passed the mid-period of life. These cases were all accompanied with œdema, and sometimes with varicose veins.

Prognosis.—Lichen is not dangerous to life, but is often exceedingly troublesome. That which originates from the more simple causes in young persons, and pursues an acute course, generally terminates in two or three weeks, but the chronic kinds may last for years. Lichen of the face is especially obstinate.

Treatment.—Simple lichen requires a treatment directed upon ordinary antiphlogistic principles; with, locally, a tepid bath, or lotions containing liquor plumbi diacetatis, distilled vinegar, or lemon-juice, to subdue the local irritation.

In more chronic forms of the eruption a purgative is always indicated, while attention should be bestowed on the secretions of the liver, kidneys, and skin, and the bowels regulated.

Lichen agrius is essentially a disease of the assimilative functions;

and its frequent association with the rheumatic and gouty diathesis must be borne in mind. Antacid purgatives, with diuretics and diaphoretics; warm purges of rhubarb and aloes, combined with diuretics; or, if the indication be obvious, with colchicum; with lemonade for drink—are the class of means to be employed. Sometimes a specific course of diuretics is attended with successful results. But the practitioner is often put upon his mettle by this disease, and must use considerable ingenuity to foil the adversary. In females I have found the mistura ferri composita, with decoctum aloes compositum, and liquor potassæ, an admirable remedy. As soon as it appears judicious to stop the purgative plan, alteratives and tonics come into play; and, in a very chronic state of the disease, the special cutaneous alteratives, Donovan's, Fowler's, and De Valangin's solutions.

The activity of treatment in lichen agrius must, of course, be regulated by the severity and extent of the eruption.

Lichen lividus is to be managed by an alterative and tonic plan of treatment, after a preliminary clearance of the alimentary canal.

The *local* treatment of lichen agrius consists in the judicious selection and application of lotions and ointments; in the *first* instance, to calm the surface while the general remedies act upon the blood; and *secondly*, to modify the local disease when it merges into a chronic form. The best lotions for the former purpose are, the saturnine spirit lotion, with camphor or vinegar; a lotion containing the sesquicarbonate of ammonia and liquor plumbi; if the itching be severe, a lotion of hydrocyanic acid; or if there be ichorous discharge, a weak spirit lotion containing one or two drachms of the oxide of zinc to the half-pint. The best ointments for the same purpose are—ceratum cetacei, with a drachm of liquor plumbi to the ounce; the oxide of zinc ointment, either alone or in combination with liquor plumbi or spiritus camphoræ; calamine ointment; or oleaginous compounds of almond oil, lime-water, and liquor plumbi, oxide of zinc, or trisnitrate of bismuth.

There has been a fashion of late—and fashions in medicine are always false and dangerous—to abuse ointments; "greasy" applications, as they are universally called. They are, nevertheless, most essential in the treatment of cutaneous complaints; and when they irritate or inflame the skin, the fault is not in the pure ointment, but in the rancidity or otherwise decomposed quality of the substance employed. Ointments are valuable as agents preventing the hyperoxygenization of the blood which occurs in all cutaneous inflammations, and which has of late rendered *lard* so conspicuous as a remedy for exanthemata, small-pox, and erysipelas. Lotions, on the contrary, unless they be kept constantly applied, are followed by desiccation of the skin, and a consequent increase of irritation of the eruption. There is one substance, however, which may be combined with any form of lotion, and is an exception to this law, namely, glycerine. Glycerine maintains a permanent state of moisture of the surface; and where ointments, in peculiar idiosyncrasies, or under particular circumstances, cannot be borne, glycerine will be found to be an efficient and useful substitute. It may be applied either in its concentrated form or in a

state of dilution; and, if there be no abrasion of the skin, is unirritant, and a mild and soothing remedy.

When the purpose of local treatment is to modify the morbid action taking place in the skin, the lotions and ointments best suited to the case are, a lotion of bichloride of mercury in almond emulsion, or in simple solution with the hydrochlorate of ammonia; a lotion containing creasote; or pencilling with the tincture of croton, or compound tincture of iodine. The ointments are, unguentum hydrargyri ammonio-chloridi; the nitrate of mercury ointment, pure or diluted; the nitric oxide of mercury ointment, pure or diluted; calomel ointment; the ointment of the deutioduret of mercury, ten grains to the ounce; the ioduret of sulphur ointment, also ten grains to the ounce; or the unguentum hydrargyri; the force of these remedies being augmented, if requisite, by the addition of friction.

I cannot say that I have seen any advantage result from the use of collodion in this complaint.

STROPHULUS.

Syn. *Exormia strophulus*, Mason Good. *Tooth-rash. Red gown. Red Gum rash. Gum rash.*

Strophulus (Plate XI.) is a disease of early infancy, consisting in the eruption of small pimples upon part, or upon the whole surface of the body. The pimples are usually red, but sometimes paler than the surrounding skin; they are attended with itching, which is increased by warmth; but they give rise to little constitutional disturbance, and terminate by resolution and epidermal desquamation.

The appearance, distribution, and color of the pimples of strophulus have given rise to its division into five varieties, namely,

Strophulus intertinctus,	Strophulus albidus,
" confertus,	" candidus.
" volaticus,	

STROPHULUS INTERTINCTUS.

Strophulus intertinctus (Plate XI., 1) the red gum rash, or red gown of popular language, is an eruption of prominent pimples of a vivid red color, upon one or several regions of the body, or generally dispersed over the entire surface, the eruption being intermingled with minute red points and erythematous patches of variable extent. The pimples remain upon the skin for some time, some disappearing, while fresh crops break forth, and the disease terminates, at the end of one or two weeks, by desquamation of the epidermis. Occasionally the strophulus appears at successive periods, being alternated by intervals of freedom from eruption. It is observed by Willan, that the pimples are developed principally on the cheeks, the backs of the hands, and the fore-arms; they are unaccompanied by symptoms of constitutional disturbance, and as frequently affect the strongest and healthiest as weakly children. Strophulus is usually coincident with acidity of

stomach and intestinal disorder, both of which may depend, with the eruption itself, upon the irritation of teething. When the eruption has been repelled by exposure to cold or mismanagement, serious effects have been produced on the nervous system and alimentary mucous membrane.

STROPHULUS CONFERTUS.

Strophulus confertus, or tooth-rash (Plate XI., 1), is a more severe variety than the preceding. The pimples are more numerous, and smaller in size; they are aggregated into considerable patches, and are often confluent. Sometimes they are distributed generally over the surface of the body, but more frequently are confined to a single spot, or to several regions, as the face, the breast, or the arms. The redness of the pimples is less vivid but more lasting than that of strophulus intertinctus; the eruption usually attains its height in twelve or fourteen days, and then subsides, leaving a copious furfuraceous desquamation of the epidermis. Strophulus confertus, according to Willan, occurs at about the fourth or fifth month; and frequently on its decline a fresh eruption succeeds.

Another form of this disease is described by the same author as taking place in infants of seven or eight months. The pimples in this modification are collected into one, two, or three large and irregular clusters, which appear upon some one point, as upon the fore-arm, and thence extend, upwards and downwards, along the arm. The patches, as well as the intermediate skin, are of a deep red color, and are succeeded by an extensive epidermal exfoliation; the skin remains, for some time after, dry and harsh, and of a dull red color.

This form of strophulus sometimes occurs upon the legs, and assumes a painful and obstinate shape. The eruption extends upwards along the thighs to the loins and abdomen, and produces a redness which is nearly continuous. The epidermis becomes dry, and cracks and separates in large flakes, leaving the integument beneath inflamed and rough. These symptoms, with considerable heat, pruritus, and irritation, may be prolonged for several months, or, as Willan remarks, they may continue until the infant completes its first year.

The constitutional symptoms of strophulus confertus, as of the preceding variety, are very slight, but the local pruritus is troublesome, and often severe. The disease is referable for its cause to the irritation of teething, as is implied in its popular designation of *tooth-rash*.

STROPHULUS VOLATICUS.

Syn. *Exormia volaticus. Erythema volaticum*, Sauvages. *Æstus volaticus. Feu volage. Wild-fire rash.*

This variety (Plate XI., K) is characterized by the eruption of papulæ of a vivid red color, in small circular clusters, which are scattered over the surface of the body. Each cluster contains from three to twelve papulæ, which are hot, and attended with itching. In a few days the inflammatory condition subsides, the pimples assume a brownish tint, and the eruption terminates by epidermal desquamation. More fre-

quently, however, new patches appear as the older ones decline, and the disease may be prolonged for several weeks. The patches of strophulus volaticus are particularly observed on the cheeks and arms.

Strophulus volaticus is accompanied with general uneasiness and fretfulness, quick pulse, white tongue, and disordered bowels.

STROPHULUS ALBIDUS.

White gum-rash.

In strophulus albidus (Plate XI., L) the pimples are white, and minute in size, each being surrounded by an areola of slight redness. They appear for the most part on the face, neck, and breast, and continue for a considerable time. They are not unfrequently intermingled with the red papulæ of the preceding varieties.

STROPHULUS CANDIDUS.

Pallid gum-rash.

In this variety (Plate XI., M) the papulæ are of larger size, and broader than in any of the preceding forms; they are hard, smooth, and tense, and without accompanying redness. The pimples are scattered irregularly over the body, but are most strongly developed on the arms, shoulders, and loins. They subside at the end of the week, and then gradually disappear. This eruption occurs most commonly in the later periods of dentition, and is sometimes observed during convalescence from inflammatory disorders.

DIAGNOSIS.—Strophulus is distinguished from other papular affections chiefly by its occurrence at the infantile period of life. The papulæ so closely resemble those of lichen as to appear identical with that disease. They are, indeed, modified only by the age of the subject in whom they are developed.

CAUSES.—Strophulus is generally due to gastric and intestinal irritation, and is frequently associated with the constitutional disturbance induced by dentition. It occasionally arises from local causes, as from deficient, irritating, or coarse clothing, want of cleanliness, excess of or improper food, heat, &c., and is usually developed in children possessing a delicate and irritable skin. The eruption often alternates with attacks of gastro-intestinal irritation. As far as its *prognosis* is concerned, it is unattended with danger, and rarely presents any features of severity.

TREATMENT.—When the eruption obviously originates in local irritation, the acting cause should be removed, and frequent ablutions adopted. The tepid bath should be used frequently, together with emollient and sedative fomentations. The pruritus, which is so annoying a symptom in this eruption, may be relieved by a lotion of acetate of lead, or sulphate of zinc, by one containing the sesquicarbonate of ammonia, acetic acid, lemon-juice, salt and water, or almond emulsion. When the eruption is dry and chapped, or when an ichorous secretion is poured out, the best application will be found

to be an ointment containing the liquor plumbi diacetatis, half a drachm to the ounce; or the oxide of zinc ointment diluted with spiritus camphoræ, a drachm to the ounce; or, again, an ointment containing hydrocyanic acid or creasote, apportioning the strength according to the necessities of the case. If the disease be associated with gastro-intestinal irritation, it is desirable to avoid the possibility of repelling the cutaneous congestion by cold applications; and where this has unfortunately been done, recourse must be immediately had to the warm bath, either simple, or medicated with a handful of mustard.

When difficult dentition is the exciting cause, relief may be obtained by incising the gums. And if gastro-intestinal irritation be present, antacid and laxative remedies should be administered. Mercury with chalk and rhubarb, are valuable medicines in this state of the alimentary canal.

PRURIGO.

Syn. *Exormia prurigo*, Mason Good. *Pruritus.*

Prurigo (Plate XI.) is a chronic and non-contagious affection of the skin, characterized by a thickened and discolored state of that membrane, and by an excessive and burning pruritus. Moreover, this state of skin is generally accompanied with an eruption of isolated and scattered papulæ, not differing in color from that of the general surface. The thickening of the skin gives it a coarseness of character, and on close examination it is found raised into small flat elevations, caused by the swelling of the little angular compartments between the linear markings. It is also more or less streaked with scratches made by the finger nails, and the torn papulæ are each surmounted by a small, thin, and black scab. The color of the skin is yellowish and dirty. The disease is unaccompanied by constitutional symptoms.

The principal varieties of prurigo, as a general affection, are three in number; to which may be added several local forms. The general varieties are:

Prurigo mitis,
" formicans,
" senilis.

PRURIGO MITIS.

In the milder form of prurigo (Plate XI., N N), the morbid change in the skin is less decided than in the severer kinds; but the pruritus is vexatious and annoying. It is brought on by mental emotion, the taking of food, or by change of temperature, and is augmented by scratching, by exercise, and the warmth of bed. The skin, which at first presented no appearance different from health, becomes by degrees thickened, indurated, and coarse; the pimples, few in number at first, become numerous, many have their points torn off, and are surmounted by a small black crust; there are scratches here and there upon the skin; it becomes yellowish and dirty; and the epidermis is

thrown off as a furfuraceous and pulverulent desquamation. Occasionally the extreme irritation produced by this eruption gives rise to the development of ecthymatous pustules.

Prurigo mitis makes its appearance in the spring and summer months, without premonitory symptoms. It is developed upon every part of the surface of the body, but its more usual seat is the posterior surface of the trunk, the shoulders, the outer sides of the limbs, as of the arms and thighs, the chest, and sometimes the face. When the disease terminates mildly, it declines at the end of two or three weeks; at other times the affection is prolonged for several months.

PRURIGO FORMICANS.

Prurigo formicans (Plate XI., N N) is a severe degree of prurigo mitis, differing from the latter in the longer duration of the disease, and in the greater violence of the pruritus. The itching is incessant, frequently insupportable, and accompanied by a most distressing sensation, compared, by the sufferers, to having their flesh devoured by thousands of ants, or to the piercing the skin with red-hot needles. Rayer observes, that patients describing their suffering speak of *heat of the blood*, *burning fires*, *maddening itchiness*, &c.[1] It is increased by every alternation of temperature, particularly by the warmth of bed; so that patients affected by this disease tear themselves cruelly with their nails throughout the entire night, and are totally unable to sleep until, towards the morning, they sink from exhaustion into forgetfulness, or after a night of disturbed sleep are awakened with the first dawn by their unsparing tormentor. The violence of the scratching to which the sufferers so afflicted yield themselves, produces redness of the skin, and by removing the heads of the papulæ, gives rise to the formation of numerous small black scabs; these little scabs, resulting from the oozing of a minute drop of blood from each of the wounded papulæ, with intermingled scratches, are frequently the only indication of the disease. Prurigo formicans is very tedious in duration, extending to several months, and sometimes, with intermissions, to years. At the termination of the disorder the skin remains dry and thickened, and the epidermis exfoliates by a furfuraceous and mealy desquamation.

Prurigo formicans is frequently associated with some visceral affection, in which case it may be preceded and accompanied by febrile disorder. When suddenly repelled, serious symptoms have been seen to arise, and call for active treatment. The disease occurs both in children and adults, and at all seasons of the year.

[1] The Abbé Morellet was afflicted with this distressing disease at the advanced age of eighty years. It obliged him to rise several times in the course of the night, to sponge his body with vinegar and water containing the acetate of lead. Writing to Alibert, he expressed himself as writhing on the "gril de St. Laurent." A soldier, affected with the same disease, compared his sufferings to being pierced all over with halberds. Alibert records several distinguished men among those who have been afflicted with this persecuting malady, as Plato, Charles V., and Charles IX.

PRURIGO SENILIS.

The prurigo of aged persons bears a close resemblance to prurigo formicans: but the disorganization of the skin is more complete, and the itching incessant. The disease is very obstinate, and frequently endures for years.

"In severe cases," write Cazenave and Schedel, "the skin becomes swollen and inflamed; eruptions of vesicles, pustules, and boils, appear; and sometimes abscesses are formed. Under such circumstances there are frequently symptoms of fever, restlessness, and sleeplessness, and sometimes indications of gastro-intestinal irritation, &c. Finally, in these serious and excessively rebellious cases, the patient is tormented with dreadful itching." In one very severe case of prurigo senilis, Willan discovered a number of minute pulices upon the skin, and he remarks upon the frequent association of the pediculus vestimentorum with the eruption; of course, he means among the lowest classes of persons.

LOCAL VARIETIES.

The principal local varieties of prurigo are three in number; they are characterized by intense itching, and by the alteration of the dermal tissues above described as constituting the general affection. Willan describes, under this designation, several other forms of distressing itching, which are unaccompanied by papulæ, and are ascribable to an altered sensibility of the cutaneous nerves. I have therefore thought it advisable to arrange the latter affections under the head of *pruritis*, and treat of them separately in a distinct section of the work. The local varieties of prurigo are—

Prurigo podicis,
" scroti,
" pudendalis.

PRURIGO PODICIS consists in an alteration of the skin, similar to that already described, around the anus, and upon the neighboring regions of the perineum and thighs. The itching is severe and distressing, and increases at night, commencing shortly after the sufferer has retired to bed, and continuing incessantly for several hours. As a consequence of scratching, the papulæ become covered by minute black scabs, which serve as a diagnostic character. This disease is exceedingly obstinate, and, unless relieved by treatment, will last for several months. After it has continued for some time the integument becomes much thickened.

This form of eruption might be advantageously considered as a chronic lichen or chronic eczema, in short, a psoriasis.

PRURIGO SCROTI is frequently an extension of the preceding affection; the papulæ are developed on the scrotum and root of the penis, and give rise to unappeasable itching. The patient, in making attempts to relieve the pruritus, often produces painful excoriations, which increase his misery.

PRURIGO PUDENDALIS is a most distressing affection, but happily, one of unfrequent occurrence. The disease is situated chiefly on the labia majora, and mucous membrane of the vulva, but sometimes extends upwards along the vagina. The pruritus is generally constant, and so violent as to induce an unceasing necessity for friction with hard substances, or scratching. The continuance of the itching produces inflammation and swelling of the parts affected, and induces symptoms approaching nymphomania.

DIAGNOSIS.—Prurigo is distinguished from other papular eruptions by the morbid alteration of the skin, and by the burning pruritus. These characters serve to render the diagnosis between prurigo and lichen very simple. The minute scabs which succeed the broken apices of the papulæ of prurigo are very similar to those of lichen simplex and scabies.

Prurigo cannot be confounded with scabies, when it is recollected that the signs of the latter are a ragged and undermined state of the epidermis, the presence of vesicles, and, above all, of the acarus scabiei. The pruritus of the two diseases is also different; in prurigo it is burning and tingling, and occurs in paroxysms, while in scabies it is constant, and more supportable; situation forms another ground of diagnosis.

CAUSES.—Prurigo appears at all seasons of the year, and at all periods of life, being modified by its occurrence at certain ages. Thus, in children and adults, the first two varieties are most frequent, while in old persons and weakly children, prurigo senilis generally appears. It has been remarked that prurigo mitis is chiefly seen during the spring and summer months. The causes of prurigo are want of cleanliness, insufficient clothing, residence in unhealthy situations, amenorrhœa, dysmenorrhœa, uterine irritation associated with pregnancy, &c. Prurigo formicans is occasionally induced by the presence of visceral disease and mental affections of long continuance, improper and overstimulating diet, stimulating drinks, deficient and improper food, &c. Prurigo senilis appears to depend upon debility of the system, a state which is popularly expressed by the term, impoverished blood.

PROGNOSIS.—Prurigo is often exceedingly obstinate, and resists every kind of treatment, and in old persons, by the continuance of irritating and unappeasable pruritus, may be destructive of life. In young and adult persons it is not attended with danger.

TREATMENT.—The first point, and one of the most important in the treatment of prurigo, is the employment of baths, which should be used daily. The temperature of the baths should not be higher than seventy degrees, and they may consist of simple water with soap, the alkaline, or sulphur bath. When the daily use of the alkaline or sulphur bath is found to irritate the skin, it should be alternated with the simple soap bath. The cold water bath and sea-bathing may also be found useful in restoring the tone of the nervous system and skin, and promoting recovery.

With a view of exciting a new action in the diseased skin, and modifying its morbid condition, stimulating applications, such as the

tincture of croton, either pure (page 127) or diluted with an equal part of spirit of rosemary, may be prescribed. Previously to the use of the croton, the skin should be prepared by repeated frictions with a damp sponge dipped in fine oatmeal, and then washed; and after the decline of the eruption which the croton excites, the frictions with oatmeal should be continued. After a few applications of the croton in this way, the bichloride of mercury in almond emulsion, in the proportion of fifteen or twenty grains to the half pint, will often complete the cure. I have seen considerable benefit result from the use of the tincture of iodine painted on the morbid surface. Another local remedy frequently of service in allaying the itching of prurigo senilis, is glycerine, applied by means of a sponge.

The applications best suited for the temporary relief of pruritus are vinegar, lemon-juice, weak solution of bichloride of mercury, tincture and watery solution of opium, creasote ointment and lotion, tar ointment, and especially that of the juniper tar, ointment of opium with camphor, the diluted nitrate of mercury ointment, ointment of lime, lotion of hydrocyanic acid, acetate of ammonia, muriate of ammonia, sulphuret of potash, chlorate of soda, &c. It is always necessary, as well as desirable, to have a number of anti-pruritic remedies at hand; for it frequently happens that one may be successful while all the rest fail, and it is constantly found that a remedy which may be perfectly effectual for this purpose in one case may be utterly useless in the next; I therefore subjoin several formulæ recommended by French dermatologists, and quoted by M. Gibert. One of these is an ointment consisting of hydrate of lime, ℥ij; subcarbonate of soda, laudanum, āā ℥ss; and lard, ℥j. An anti-pruriginous ointment recommended by Alibert is as follows: Laudanum, sublimed sulphur, āā ℥ss; oxide of zinc, ℥j; oil of almonds, ℥j; lard, ℥iij. Biett employed successfully, for an obstinate prurigo of the hands: Cinnabar, laudanum, āā ℥ij; sublimed sulphur, ℥ss; lard, ℥v. And for local prurigo, the following was found of service: Muriate of ammonia, ℥j; powder of white hellebore, ℥ss; lard, ℥iij.

The general treatment of prurigo must consist in the avoidance of stimulating food and drinks, and the use of laxative medicines, diuretics, diaphoretics, alkalies combined with bitter infusions, acid tonics, &c. Sulphur with cream of tartar, in moderate doses night and morning, for two or three weeks, is sometimes found useful, particularly in the prurigo mitis of children. If the patient have a full pulse, and be plethoric, the loss of a quantity of blood proportioned to his strength is requisite, especially in cases of prurigo formicans. Indeed, I have seen bleeding in such cases act like a charm in allaying the unappeasable torture from which the patient was suffering. In prurigo senilis, a generous and nutritious diet is indicated, with occasional laxative and tonic medicines. When the disease resists the influence of other means, Donovan's solution, or the liquor arsenicalis, may be exhibited without hesitation; of the former, ten to twenty minims three times a day; of the latter, three to five; with meals. It is necessary, in directing the use of these solutions, to advise the common precaution of avoiding acids, fruits, and vegetables, and the

omission of the drops whenever any pain, giddiness, or uneasy sensations in the head, nausea, sickness, or pinchings of the stomach, are experienced. They may be resumed after a rest of a day or two, or as soon as the symptoms have subsided, and if necessary be continued in a diminished dose.

Prurigo podicis and prurigo scroti must be treated on the general principles stated above; in most cases constitutional treatment is required. The local means for relieving the pruritus are especially needed in prurigo podicis and prurigo scroti; and, in the former, abstraction of blood from the verge of the anus, by means of leeches, might possibly be useful. Additional local applications are, cold poultices or compresses, ice, cold hip-baths, opium suppositories, cold cream, poultices saturated with liquor plumbi, acetate of lead ointment, the dilute nitrate of mercury ointment, the yellow and black wash, chlorate of soda lotion, &c.

In prurigo pudendalis the local remedies recommended above will be found useful, and their use must be aided by general means, and by depletion, by leeches, from the vulva. The juniper tar ointment is particularly useful in prurigo of the pudendal region.

CHAPTER VII.

DISEASES ARISING FROM GENERAL CAUSES.

ECZEMATOUS OR VESICULAR ERUPTIONS.

THE special character of the eruptions considered under this head, is the effusion on the surface of the derma, and beneath the epidermis, of a colorless and limpid or ichorous fluid which raises the epidermis into small vesicles. In the eruption called *sudamina* no other characters are present; but in eczema, which is the typical form of the affection, there is more or less vascular congestion of the skin, namely, erythema; more or less œdematous swelling; and more or less of a lichenous eruption resulting from congestion of the vascular parietes of the cutaneous follicles. In those regions of the body where the epidermis is thin, it is easily lifted from its bed by the effusion beneath it, and the vesicles are distinct and well defined; but where the epidermis is thick, as on the fingers and hands, as also on the feet, the effused ichor being resisted in its vertical pressure, the vesicles are not so distinct, and the fluid spreading horizontally, the epidermis becomes separated from the derma, to a greater or less extent; and on the decline of the eruption is thrown off in large flakes.

Willan's definition of *vesicula* is, "a small orbicular elevation of the cuticle, containing lymph, which is sometimes clear and colorless, but often opaque, and whitish or pearl colored. It is succeeded either by scurf or by a laminated scab." Vesicles are rarely seen in the precise

and definite form here described, excepting in situations favorable for their development, as on the back of the hand, and at the commencement of the eruption. At this early period they may be seen like transparent granules on the skin, some discrete, and others confluent; later in the progress of the complaint the epidermis may have been rubbed off, and then the ichorous secretion becomes the prominent feature of the disease. At the first moment of effusion the ichor or lymph is always transparent, and mostly colorless, or slightly tinged with the coloring principle of the bile; very soon it becomes whitish and opaque, and the vesicles have the appearance of minute pearls. The exact seat of the vesicles is the same as that of the papules of lichen, namely, the apertures of the follicles of the skin, where they may be developed completely round the opening, or merely on its lip.

In his Order Vesiculæ, Willan assembled seven genera of eruptions, namely, varicella, vaccinia, herpes, rupia, miliaria, eczema, and aphtha. Of these seven I have retained only two, namely, eczema, as the type of the eruption, and miliaria. Of the remaining five, varicella and vaccinia are forms of variola, and are classed with that disease. Herpes I have taken as the type of a group of large vesicles gradually expanding into the bullæ of. pemphigus. Rupia I have transferred to its proper place among the syphilitic eruptions; and aphtha, although a simple vesicular eruption, is an affection of the mucous membrane, and not of the skin.

In the present group of cutaneous affections, the eczematous group, I have thought it right to restore to its proper place, that term derived from the Hebrew, tsorat, namely, *psoriasis*, which, as Mason Good observes, "having lost its primitive and restricted signification, *seems to have wandered in search of a meaning*, and had at different times, and by different persons, various meanings attributed to it; being sometimes used to express scaly eruptions generally, sometimes the scales of leprosy; but at last, and with a pretty common consent, the far slighter efflorescence of scaly tetters or scalls, denominated in the Levitical code *saphat;* and by the Latins *scabies*, or impetigo sicca."[1] Psoriasis, in its proper acceptation, signifies a scaliness of the skin, resulting from chronic erythema, attended with thickening of the tissues of the derma, and more or less chapping of the inflamed part; in a word, *chronic eczema*, when eczema, has produced a thickened and chapped state of the skin, and ceasing to pour out an ichorous secretion, throws off from the inflamed surface a successive crop of scales; or *chronic lichen agrius*, when lichen has left a similar condition of the skin, the papules of the original eruption being obliterated in the general thickening of the chronically inflamed part. In brief, psoriasis is to eczema and lichen agrius what pityriasis is to erythema.

It will be seen by these observations that I might have introduced

[1] Riolanus terms Eczema *scabies humida;* and defines the other division of scabies, namely, *scabies sicca*, as being rough and pimply like goose-skin, in which definition we recognize our present lichen. And scabies sicca, according as it produces small and furfuraceous scales, or larger ones like fish scales, he denominates *psora porrigo* and *psora lepra*. Psora porrigo, therefore, corresponds with the pityriasis of modern nomenclature, and psora lepra with lepra vulgaris.

psoriasis into the group of lichenous eruptions following lichen agrius; but I have preferred to attach it to eczema, and the more so, because lichen agrius may be regarded as holding a transition-place between lichen and eczema, as being in fact a lichen passing into the stage of eczema, or assuming the characters of eczema, of being indeed a lichen eczematosus.

Under the head of Lepra will be shown the differences between that disease and psoriasis, two affections commonly grouped together at the present day, from the existence of scales in both; but essentially distinct in the nature of their respective scales, and equally distinct in their origin and phenomena.

ECZEMA.

Syn. *Ecphlysis eczema*, Mason Good. *Humid tetter, or scall.* *Dartre squameuse humide*, Alibert. *Heat eruption.*

Eczema[1] (Plate IX.) is a non-contagious affection of the skin, characterized by the eruption of minute vesicles in great numbers, and frequently confluent, upon a surface of irregular form, and usually of considerable extent. The vesicles are so closely aggregated in some situations, as to give rise to one continuous vesicle of great breadth. These larger vesicles, when laid open, appear to be cellular in their structure; the cellular disposition obviously depending on the juxtaposition of the numerous small vesicles of which they are composed. The vesicles of eczema terminate by absorption of the fluid which they contain, or by rupture and moist excoriations succeeded by thin crusts, and by furfuraceous desquamation. The eruption is generally successive, and variable in duration; it sometimes extends to the mucous membrane, and is often developed on the scalp, and hair-bearing parts of the body.

The varieties of eczema are divisible into two groups, *acute* and *chronic*. In the former are arranged four principal varieties, and in the latter, one only. Besides these, several local forms of the disease, either from their severity, or from certain peculiarities which they present, deserve separate consideration, and may be assembled in a third group, the members of that group being susceptible of assuming, as circumstances may determine, either the acute or the chronic type. The varieties of eczema, therefore, are,—

1. *Acute.*

Eczema simplex,
" rubrum,
Eczema impetiginodes,
" infantile.

2. *Chronic.*

Eczema chronicum, *vel* psoriasis.

3. *Local forms.*

Eczema capitis,
" faciei,
" aurium,
" mammillarum,
Eczema pudendi,
" articulorum,
" manuum et pedum.

[1] Der ἐκζεῖν, effervere, to boil out.

ECZEMA SIMPLEX.

Syn. *Humid tetter. Eczema solare*, Willan.

In this, the most simple form of eczema[1] (Plate IX., I I) the vesicles, about the size of the head of a small pin, exceedingly numerous, and clustered into confluent patches of various extent, are accompanied by only a slight degree of redness and inflammation of the skin.

The eruption makes its appearance suddenly, without premonitory symptoms, and the vesicles are distended with a transparent lymph, which gradually becomes opaline, and afterwards milky. The fluid is then by degrees absorbed, and the epidermis shrivels into a thin pellicle, which is thrown off by desquamation. When, however, the vesicles are broken, as frequently occurs, the scale which follows is thicker and more adherent, and remains attached to the surface for a longer period. The affection is generally prolonged by successive eruptions for two or three, and sometimes for a greater number of weeks, but is so slight as to leave behind it no trace of the previous existence of morbid action. It is accompanied by itching, which is sometimes considerable and troublesome, but presents no constitutional symptoms. Rayer remarks that the vesicles "usually correspond with the minute projections whence the hairs issue, and which may be very distinctly seen by examining the insides of the arms and thighs with attention."

Eczema is sometimes general, but more frequently local, and may occur on any part of the body. Rayer alludes to a variety of eczema simplex described by Dr. Levain. This variety, which is purely accidental, and appertains rather to eczema rubrum than eczema simplex, is "distinguished by clustered patches of vesicles, the dimensions of which vary from those of a sovereign to those of a two-sovereign piece." "The clusters are scattered over the skin, which only appears red in the places affected. On the red patches, covered with vesicles, the cuticle may sometimes be raised and removed in a single piece."

ECZEMA RUBRUM.

Syn. *Humid tetter. Running scall. Dartre vive. Dartre squameuse humide*, Alibert. *Dartre erysipelateuse. Herpes squamosus madidans.*

Eczema rubrum, or inflammatory eczema (Plate IX., K K), is distinguished from the preceding variety by the development of the vesicles upon a surface which is tense, swollen, and of a vivid red color. The eruption appears, in the first instance, in the form of minute white points, dispersed in great numbers over the inflamed surface. These speedily increase in size, and become small, transparent vesicles, filled with a viscous, colorless lymph, and surrounded by an

[1] "Portraits of Diseases of the Skin," Plate III, X represents eczema simplex and eczema rubrum on the arm and hand.

areola of deeper redness. At other times, the skin being red and swollen, the pores are elevated into pimples like those of lichen. The slightest friction, or the removal of a dressing which has adhered to the pimples, brings off the loosened cuticle which covers them; and then, in lieu of pimples, we have small circular excoriations, about one line in diameter, and more vividly red than the rest of the skin. These little circular excoriations are dispersed irregularly over the inflamed surface, some being isolated, others confluent, while here and there they constitute a patch of larger size; they are moist with an ichorous discharge which they pour out, often in large quantity, and resemble so many little springs issuing on the inflamed surface. When the disease terminates favorably, the redness subsides at the end of a few days or a week, the fluid contained within the vesicles is absorbed, and their epidermal parietes shrivel and dry up, forming thin scales, which are thrown off by desquamation, leaving a redness of the skin, which continues for a considerable time.

When the affection is more severe, the inflammation augments, and the vesicles become confluent. Their contents, at first transparent, become turbid and milky; they burst almost as soon as formed, and leave behind them inflamed and excoriated surfaces, which pour out an abundant secretion. The ichor from the inflamed surfaces is profuse and irritating, and serves to increase the extent of the excoriations.[1] The exposed derma is of a bright crimson color, and is covered here and there with flakes of a whitish membranous film. Some of these crimson excoriations are bordered by an abrupt margin of thick and softened epidermis. When the discharge diminishes in quantity, it concretes into the form of softish lamellæ, which harden by exposure to the atmosphere, and constitute scabs of various extent and thickness. The more severe degrees of eczema rubrum endure for several weeks, and are apt to assume the chronic form.

Eczema mercuriale.—A form of eczema rubrum, only differing from that now described in its supposed exciting cause, has been distinguished by the name of eczema mercuriale, and has received the various synonyms of *Hydrargyria; Erythema mercuriale; Erythema vesiculare; Erythema ichorosum*, Marcet; and *Mercurial lepra*, Moriarty. Dr. Alley describes three varieties, or rather degrees, of this rare affection—namely, hydrargyria mitis, febrilis, and maligna.

Eczema mercuriale is characterized by a red efflorescence occurring in patches of variable size, and surmounted by minute transparent vesicles. In the mild form of the affection the vesicles are very small, but in the more severe degrees they are larger, and their transparent contents opaque and purulent. In some instances, where febrile symptoms are present, the efflorescence occupies a large extent of surface, sometimes the entire body, and assumes the appearance of roseola; at a later period the blotches coalesce, and form patches of larger size. The usual seat of the eruption is the trunk, or the thin skin of the pudendal region; sometimes it appears first on the backs of the hands,

[1] A patient from the west of England, who consulted me lately, in reference to this ichorous secretion, made use of the very expressive term "anguish water."

and more rarely on the face. The eruption is preceded by heat and smarting of the skin, and its progress is marked by excessive heat, smarting, and pruritus. When the vesicles are minute, they dry up without giving rise to secondary inconvenience; but when they occur in folds of the skin, or are larger in size, they are usually broken, and the abraded derma pours out an acrid and offensive[1] ichor in considerable quantity. When the eruption declines, as usually happens about the tenth or twelfth day in the mild form of the disease, and at a variable period later in the severe forms, the epidermis is thrown off by repeated desquamation, leaving the skin of a deeply red color. Sometimes at the close of the eruption the disease concentrates itself on a particular spot, and remains obstinately fixed for weeks or months.

Mercurial eczema, in its mildest form, may appear without constitutional symptoms, or with trifling gastro-intestinal disturbance and feverishness. But in a more severe degree—that, for instance, named *febrilis* by Dr. Alley—the attack is marked by rigors, nausea, pains in the head, diminished secretions, and other symptoms of constitutional disturbance. The fauces are more or less inflamed, and the congestion of the mucous membrane often extends to the bronchial tubes. In the most violent form of the affection, namely, in that produced by a continuance in the use of mercury after the eruption has appeared, the hydrargyria maligna of Dr. Alley, the face is enormously swollen, the eyelids closed, the throat tumefied and painful, the color of the efflorescence of a deep purple color, and all the symptoms aggravated. The epidermal exfoliation continues for a greater length of time, it is thrown off in large flakes, and the nails are sometimes cast with the epidermis. Persons who have once suffered from eczema mercuriale are subject to subsequent attacks.

The mercurial eruption is sometimes the consequence of a long-continued use of mercury, but occasionally would seem to depend on a peculiar idiosyncrasy of the individual, unless we suppose the eyes of the observers to have become so obscured by a favorite hypothesis, as to see nothing but hydrargyria in every inflammatory eczema, developed after taking a dose of medicine containing a particle of mercury. This idea is naturally suggested when we read of eczema mercuriale following the exhibition of a single blue pill; but I am bound to admit, that in certain constitutions the influence of mercury is poisonous even in the smallest quantity. I once saw a man salivated by the metallic alloy used for stopping his tooth; and I have at present under my care a lady who has several times had a very troublesome attack of lichenous erythema following the administration of a small dose of mercury. She is so sensitive of this metal that she has more than once detected it in her medicine when it had been inadvertently prescribed; and on a late occasion, having received on her hands and arms the gastric fluids of her child, who had taken a dose of gray powder, in a few hours afterwards she felt a return of the old irritation of the skin. More commonly, mercurial inunction, or a mercurial atmosphere, has preceded the eczematous eruption. Dr. Alley

[1] Spens compares it to putrid fish.

conceives that in his case the effect of the mercurial ointment may have been heightened by its admixture with camphor, the formula consisting of two scruples of the latter to an ounce of the unguent. Dr. Moriarty[1] assigns opium as a cause of this eruption. Indeed, the susceptibility of the skin after an attack is so great, that in Hewson Bigger's case it recurred several times under the use of opium. In Dr. Crawford's case,[2] the eruption was reproduced by one grain of opium. Cold, also, has had the effect of re-exciting it.

The treatment of eczema mercuriale consists in the removal of the cause, and the pursuance of the general plan laid down for the management of eczema rubrum. Dr. Crawford found a liniment of oil and lime-water the best local application. Internally he gave tonics. Dr. Marcet's[3] case, which followed an attack of gonorrhœa, was treated with the warm bath, poultices moistened with liquor plumbi, and diaphoretic laxatives.[4]

ECZEMA IMPETIGINODES.

Eczema impetiginodes (Plate IX., L L) may either be a severe degree of eczema rubrum—that is, an eczema rubrum aggravated by irritating causes to the production of the small psydracious pustules of impetigo, or a copious semipurulent secretion; or it may be an eczema rubrum developed in a person possessing the pyogenic diathesis, as commonly happens in weakly lymphatic children and women. Devergie remarks, that eczema takes on the impetiginous character in the proportion of thirty-five per cent.

In eczema impetiginodes the skin is highly inflamed and swollen, and the vesicles, in many places aggregated into confluent clusters, often communicate with each other, and form a continuous vesicle of some extent. The contents of the vesicles, at first limpid, soon become turbid and puriform, and are effused on the surface by the rupture of the epidermis, and the purulent secretion concrete into yellowish, lamellated crusts, often of considerable extent. When the crusts are rubbed off, or removed, the exposed surface of the derma presents a vivid crimson color, partly concealed here and there by films of whitish lymph, and secreting an abundant ichorous fluid, having a reddish tinge. This secretion hardens, if the inflamed surface be exposed to the influence of the atmosphere, into a thin, dark-colored scab, which remains, unless disturbed by accident or design, until the excoriated surface is healed.

The eruption of eczema impetiginodes, as of the milder forms of the disease, is successive; fresh crops of pustular vesicles are produced as the first decline, and the disease is prolonged for two, three, or more weeks, often lapsing into the chronic form of eczema.

Eczema impetiginodes is for the most part local in its attack, confining itself to a single region of the body, and that of limited extent. The forearms and hands are the frequent seat of the disease, and the

[1] Edinburgh Medical and Surgical Journal, vol. xvi. p. 37. [2] Idem.
[3] Medico-Chirurgical Transactions, vol. ii.
[4] The Edinburgh Medical and Surgical Journal contains other cases by Dr. Spens, vol. i.; Dr. MacMullen, vol. ii.; Dr. Rutter, vol. v.; and Dr. Ramsey, vol. vii.

face is not uncommonly affected. In these cases there are no special constitutional symptoms. But when the eruption is general, or when children are the subjects of the partial affection in any degree of severity, the ordinary constitutional symptoms accompanying inflammation are developed, viz., quick circulation, excited nervous system, disordered digestive system, and diminished secretions. The local symptoms are burning and distressing heat, and excessive smarting and throbbing, augmented by the warmth of bed, and destructive of sleep.

ECZEMA INFANTILE.

Syn. *Crusta lactea. Tinea lactea. Porrigo larvalis. Tinea mucosa; Tinea granulata;* Alibert. *Milchgrind, Milchschorf;* Germ. *Psoriasis infantilis.*

Infants at the breast and young children are peculiarly subject to eczema, and in them it is apt to assume the severest form presented by cutaneous disease. In young infants it commences at the end of the first month or six weeks, and, unless submitted to proper treatment, may continue for months and years; in fact, lay the foundation of a cutaneous disease which may be prolonged in a chronic form until manhood, or may hang about the patient for the remainder of his days.

Eczema infantile, like eczema adultorum, originates in mal-assimilation, and, with good reason, is commonly ascribed to a faulty secretion of milk on the part of the mother; but when once established, is not remedied, as might be expected, by the withdrawal of the cause and the substitution of a different and less faulty food. Unsuccessful attempts to cure the disease, probably, carry the child on to the period of cutting the teeth; then the continuance of the disease is attributed to dentition, this time without so good reason, and hopes are raised that when the milk teeth are perfected the disease will subside. The milk teeth are all cut, but still the eczema lingers, and then a new light of prophecy beams upon the little patient; when puberty arrives, then certainly the disease will go; but puberty possesses as little of the physician's art as change of food, or completed primary dentition; and so the malady becomes perpetuated. I have seen this picture in life so frequently that I could not refrain from sketching it.

It is remarkable how trivial an exciting cause may become the origin of this distressing malady. A lady, six weeks after her confinement, travelled by the railroad from London to the sea-coast, carrying with her her infant. She was chilled by the journey, was feverish during the night; her infant was feverish the following day, and threw out an eruption of eczema, which brought the child to me some months afterwards. This day a neighbor brought me her infant covered with eczema from head to foot; the child was a few months old; in her confinement the mother lost her husband under painful circumstances; the distress caused by this affliction was transmitted to the offspring as an eczema rubrum. How small the cause of mal-

assimilation in these cases, which may be taken as the type of the whole family; how easily is the assimilative function of infants disturbed; how difficult often to restore!

When cutaneous eruption attacks an infant under these circumstances, it revels in all the typical and modified forms of cutaneous disease. At the same moment, and on the same child, may be seen erythema, lichen, strophulus, eczema, impetigo, pityriasis, and psoriasis, and an observant nurse seems to take a special delight in pointing out the various diseases which pervade the flesh of the poor little sufferer. In certain parts of the body erythema is apt to prevail; but a broken or cracked state of the skin, with however small a degree of ichorous oozing, must determine the case to be an eczema. On the back lichen is apt to predominate; on the head, in the bends of the joints, and on the pudendum, eczema; on the cheeks and ears, eczema impetiginodes; all on the same skin and in gross defiance of the orders, genera, and species of the Plenckio-Willanean method of classification.

The predominance of one or other of the typical forms of cutaneous eruption is determined by the condition and temperament of the infant. The child may present every shade of variation of appearance from a state difficult to distinguish from complete health to one in which the little thing is attenuated and shrivelled up, and looks like a little old man. In the former extreme, however ruddy and full the child may seem, there is evidence of an existing weakness in the softness of its muscles; but, with that exception, no trace of disorder of constitutional health can be discovered. Next to softness of muscles comes pallor in a slight degree; then an increasing whiteness of the eye, attributable to progressing anæmia; then follows emaciation; the skin shows signs of wrinkles, becomes dry and discolored, and ultimately sordid. With these, the outward signs of the disease, of mal-assimilation in fact, there is rarely any disturbance, or but little, of the digestive organs; the child takes its food well, and is not particularly restless or fretful. Sometimes the motions are green; sometimes mingled with an excess of mucus, and sometimes white from suspended biliary secretion; but there is nothing beyond the commonest gastro-intestinal derangement, and that in a very insignificant degree.

The eruption usually commences as a patch or blotch of slightly raised pimples; the patch is itchy, is rubbed, increases in size, becomes more inflamed, the cuticle is raised in more or less defined vesicles, which are usually broken by friction, the surface becomes excoriated, somewhat swollen, and pours out an ichorous secretion, varying from a mere oozing to an excess that wets through everything that is applied to it. With the increase of irritation, consequent on the excessive secretion and the congestion which gives rise to it, the patch spreads; where the eruption commenced by several blotches, they probably run into one; the ichorous discharge also increases the local disease, by irritating the parts over which it flows. The case up to this time is one of inflammatory eczema, or *eczema rubrum*. The state of *eczema simplex* has hardly existed, and is only to be seen occasionally; but

the disease still runs on, its violence increases, and the morbid secretion, from being a transparent and colorless ichor, like water in appearance, becomes slightly opaque (tinea mucosa), milky, then yellowish and semipurulent, and the case is transformed into *eczema impetiginodes*; or the discharge may take on a still more decidedly purulent character, while small pustules are developed on the red and tumefied skin around the patch, and then the case is one of *impetigo*. Thus the plus or minus of these pathological conditions, irrespective of the cause or essential nature of the disease; in other words, the disease being the same, it may, according to the temperament or constitution of the child, be an erythema verging upon eczema; an eczema rubrum; an eczema verging on impetigo or eczema impetiginodes; or, the pustular element being in excess, it may be an impetigo. Again, as I have before said, whatever the predominating character may be, whether erythema, lichen, eczema, or impetigo, there will always be present in a greater or less degree some, or the whole of the other forms sprinkled over the body; a simple erythema here, an erythema with strophulus or lichen there, a few scattered vesicles of eczema in a third place; or a few congregated psydracious pustules of impetigo in a fourth.

In this description of the general characters of eczema infantile, I suppose the eruption to be comparatively undisturbed; but that is rarely the case, the great heat, the prickling, the tingling, the intense itching which accompany the disease, render abstinence from rubbing and scratching impossible; hence these have to be added to the causes of aggravation of the local disorder. Again, the burning heat of the skin on the one hand, and exposure to the atmosphere on the other, tend to desiccate the surface very rapidly, the contents of the vesicles in the simplest form of the affection dry up into a thin, transparent, amber-colored crust; in eczema rubrum, with a more copious discharge, the crust is less transparent and thicker; and in eczema impetiginodes it is still further increased in thickness, is lighter both in color and texture, and uneven in surface; while in impetigo, from the desiccated matter being pus, it is thickest of all, and has the appearance of dried honey; this circumstance has given the name of *melitagra* to the latter disease. As may be supposed, the crust presents considerable variety of appearance, according to the prevalence of accidental circumstances in a greater or less degree, such as accumulation of secretion, amount of desiccation, &c. Not unfrequently, as a consequence of pressure or friction, blood is mingled with the discharges, and the crusts become colored of various hues from a lightish brown to positive black. Again, a variety of color results from the age of the crust, that which has been longest formed being usually lighter than the rest; and another difference occurs when the original crust is broken, and a new discharge issues from between the several fragments.

Sometimes this terrible disease attacks the whole body of the child, and the little thing has scarcely a patch of sound skin on its entire surface, being covered from head to foot with erythema, excoriations, and scabs of every variety of size and dimensions, and giving out an

offensive valerianic odor which has been compared to the urine of cats; but more frequently it is limited to one or more regions of the body, the commonest seats of the eruption being the head and face, the front of the chest, the umbilicus, the pudendal region, and the flexures of the joints. On the head the eruption is complicated by the presence of hair, which entangles the discharges, and the crusts are apt to form, in consequence, of considerable thickness, sometimes including the entire scalp in a thick, rugged, yellowish, and discolored cap. At other times, when the discharge is less abundant, it dries up into a friable crust, which, broken into small fragments by scratching and rubbing, has been compared to particles of mortar dispersed among the hair, and has received the name of *tinea granulata.* Many of these particles of crust being pierced by the hairs, have the appearance of a string of rude beads. Later in the history of the eruption, and when it has become decidedly chronic, when erythema of the scalp with copious furfuraceous desquamation are the leading characters of the disease, it has been termed *tinea furfuracea;* and later still, when, with a slighter degree of erythema, the epidermal exfoliation is mealy, the case is one of *pityriasis capitis.*

When the ears are attacked they become much swollen, and give forth an excessive quantity of ichorous secretion, which may be seen distilling from the pores of the skin, and standing in drops on the inflamed and excoriated surface. When the disease fixes on the face it is also attended with swelling, and often gives the child a bloated and frightful appearance, every feature being distorted; and the deformity is increased by the production of a thick discolored scab, which forms a mask sometimes to the entire face. This huge, unnatural mask covering the child's face, suggested the term *larvalis*, given to one of his species of porrigo by Willan; only that, instead of porrigo larvalis, it should have been *eczema larvale*, or impetigo larvalis. Again, from occurring at the milk period of life, this extraordinary crust, whether arising from the desiccated secretions of eczema rubrum, eczema impetiginodes, or impetigo proper, has received the name of milk-crust, or *crusta lactea.*

The inflammation of the scalp and face is apt to produce, as one of its secondary effects, enlargement, and sometimes suppuration of the lymphatic glands. Thus we find the gland situated behind the ear, the occipital, the submental, and cervical lymphatic glands swollen and painful; and not unfrequently, in a pyogenic diathesis, there are superficial abscesses in the neighborhood of these glands.

The pudendal region, both in the male and female infant, is not uncommonly the seat of the eruption, being determined to this region partly by the heat and moisture resulting from its function, and partly by the thinness and delicacy of the skin.

For the latter reason it is commonly met with in the flexures of the elbows and knees, and sometimes in the axillæ. In the flexures of the joints the inflamed skin is apt to crack into fissures of considerable length and depth, and often to bleed; the blood mingling with the excessive ichorous secretion poured out by the denuded skin.

The general character of eczema infantile is to form patches of con-

siderable size, several inches square, and to attack, as I have already explained, a whole region at once, such as the head, face, &c.; but in addition to this, and sometimes without these extensive patches, the eruption appears in rounded blotches from half an inch to two inches in diameter, sprinkled upon the skin in various parts, as upon the trunk, neck, arms, and legs. These patches are identical with the circumscribed patches which are seen upon the skin in lichen agrius, and the eruption has more of the character of the latter disease than of eczema rubrum. The blotches are raised, thickened, papulated, excessively irritable, discharging but a small quantity of ichorous fluid, and covered, when desiccated, with thin, squamous, laminated crusts.

Eczema infantile, when left to itself, has no natural tendency to resolution or spontaneous cure; on the contrary, it merges progressively into a chronic form, and undergoes that kind of modification which is common to cutaneous disease when passing from an acute to a chronic stage. By degrees the ichorous discharge diminishes, and the eruption retires to certain situations, where it continues to linger, sometimes subsiding into a state of calm, and sometimes breaking out afresh like a slumbering volcano. The situations on which it most commonly retreats, are the scalp, the eyelids, the ears, particularly the backs of the ears; the integument around the mouth, the arm-pits, the groins, and the bends of the elbows, wrists, knees, and ankles. The parts of the skin over which it has passed are arid and parched; and the fountains of moisture, the natural secretions from the skin, the perspiratory and sebaceous secretions, are dried up. On the scalp the dried and parched skin, continually throwing off a furfuraceous desquamation, presents the common characters of *pityriasis capitis*. And not only is the skin left in a state of parched exhaustion, but the hair also is dried up, is scanty in quantity, and its growth is arrested.

The dry, parched, hot, fevered state of the skin, which is the common sequel of eczema infantile, is a sign of the disorganization and extreme disturbance of function which the skin has undergone. Even where there was no eruption, the cuticle is rugged and constantly thrown off as a mealy exfoliation; but where the eruption existed, as around the eyelids, upon the ears, around the mouth, and in the bends of the joints, the skin is more or less red, thickened, uneven, cracked, and chapped, and the ichorous secretion having ceased, it throws off perpetually scales of dried cuticle of various size, some being mealy, others furfuraceous, and others as large as the finger-nail. This, then, is a case of genuine psoriasis; eczema infantile has therefore become, by the mere result of continuance, chronic eczema infantile; or, in other words, *psoriasis infantilis*.

This process of constant exfoliation is necessarily attended with pruritus, which is often very considerable; the inflamed part is then rubbed and scratched, and from time to time the ichorous secretion is reproduced.

I have noted that, in the early outbreak of the eruption, the only trace of deteriorated condition that may be present in the child is a feeling of softness of the muscles, and a slight degree of paleness of

the skin and of the conjunctiva; in fact, the discernment of these trivial but nevertheless significant signs is a matter of observation and tact. Later, however, in the progress of the disease, these signs become sufficiently obvious to attract the attention of the unobservant; and later still, the poor little child is strangely altered from its normal state; mal-assimilation, cacochymia, are traced in conspicuous lines on every part of the surface, in every feature. The limbs are thin, showing out the prominence of the joints; the muscles are soft and flabby; the skin is soft and pasty, or discolored and shrivelled; there is an expression of care, anxiety, of thought, upon the little face; from the general emaciation of the body, the head looks larger than natural; as I before observed, one is struck with the senile look of the child; the mucous membrane of the conjunctiva and mouth is pale; and, above all, is the strangely white anæmic eye, sometimes dull and listless, and sometimes bright and clear. The eye tells an eloquent tale of defective nutrition.

I have remarked above that the symptoms of internal disorder are but trifling at the commencement of the disorder; and far from being severe through its course; they attract little of the attention either of the mother of the child or of the medical man. The great, the urgent symptom of the whole is the teasing, the intense, the violent itching; sometimes the itching is constant, with frequent exacerbations; sometimes there are intervals of repose, which are apt to be disturbed by any change of temperature, and then a violent attack of pruritus recommences; but the crowning suffering of all occurs at night; the child is often frantic with itching; it scratches with all its force, digging its little nails into the flesh, while the blood and ichor run down in streams. At last, worn out with suffering and exhaustion, the child sleeps, probably to be awaked again several times in the night by a repetition of the same agony. This constant suffering naturally wears out the child's powers, and added to the mal-assimilation, brings about that state of atrophy which I have previously described. But it is nevertheless remarkable how little the strength and spirits of the child are affected by these separate paroxysms of suffering; in the morning, after a night of distress, the little thing is fresh and lively, eager for its food, and ready for the battle of the day; while the nurse or mother is languid and powerless, from watching and anxiety.

Not unfrequently, in eczema infantile, the mucous membrane of the mouth and nose, of the air-tubes and lungs, and of the alimentary canal, participates in the disease, and is either affected simultaneously with the skin, or takes a vicarious part. The affection of the alimentary canal gives rise to diarrhœa and the production of mucus in large quantities, and sometimes of coagulated lymph. The affection of the mucous membrane of the mouth and nose is shown by redness, sometimes aphthæ and augmented secretion; and the eczematous congestion of the mucous membrane of the air-tubes produces bronchitis in various degrees, accompanied with hoarseness, from thickening of the mucous lining of the larynx, and an excessive accumulation of phlegm throughout the lungs. This latter symptom is one which is

calculated to give us some anxjety, and requires dexterous management; but it is less severe than common bronchitis, and is often as sudden in getting well as in its attack. When the mucous membrane of the mouth and air-passages is affected, hoarseness is a conspicuous and striking feature of the complaint; the hoarse cry is unmistakable, and is sometimes the first and only sign of the congestion of the mucous membrane. It is a sign as diagnostic of congestion of the respiratory mucous membrane, as is whiteness of the eye of general anæmia.

In the TREATMENT of eczema infantile, the three great principles which I have already laid down as the *law of treatment* of cutaneous disease, namely, *elimination*, *restoration of power*, and *alleviation of local distress*, are to be put in force, but with a change in their order. Elimination must always go first; but in eczema infantile I would place alleviation of local distress second; and restoration of power third. Thus the principles of treatment, the indications for treatment, being settled, let us consider the means.

For *elimination*, the remedy is calomel or gray powder: I prefer the former; one grain of calomel rubbed down with one grain of white sugar, or sugar of milk, is the dose for the youngest infant; for a child a year old, a grain and a-half; for a child two years old, two grains. Of course this dose is modified according to the apparent strength of the child in the first instance, and in accordance with the action of the medicine in the second; the object to be obtained being such a dose as will produce an efficient relief to the alimentary canal; and moreover, such an amount of relief as shall act as a diversion to the morbid secreting action taking place in the skin; in other words, to divert the morbid secretions of the skin into their more natural and proper channel, the alimentary canal. For this purpose calomel excels every other medicine; from its small bulk it is convenient for exhibition, merely requiring to be dropped into the child's mouth; it stimulates the liver to an increased flow of bile; and in children it always acts most kindly on the alimentary canal. Again, a free action of the alimentary canal being secured, all probability of *repulsion* of the eruption by the remedies required for the second indication is at an end; and the mother's and nurse's alarms lest the disease should be driven in are set at rest. A free clearance of the stomach and bowels is therefore a primary, a necessary step at the very commencement of the treatment. After the first dose, the calomel may be repeated according to circumstances; once a week, twice a week, every other night for a few times; even every night for two or three nights, if absolutely necessary. In my own practice, I usually find once a week sufficient, and I am guided to the repetition of the dose by the state of the little patient. If there be any feverishness, fractiousness, irritability of temper, any increase of pruritus, inaction of the bowels, morbid secretion of the bowels, or threatened congestion of the mucous membrane of the air-tubes, then the calomel powder is to be administered at once, without hesitation, and without delay. The mother or nurse soon learns the moment for a powder, and whatever prejudices they may have to the name of calomel, they are always ready to re-

sort to it after they have once seen its action in this disease. As I have already said, I have no objection to the mercury with chalk beyond the fact of its being more bulky and less agreeable to swallow, while it certainly possesses no recommendation which can render it superior to calomel. Sometimes I find one or two grains of nitrate of potash a useful addition to the calomel and sugar.

Having disposed of the first indication, and cleared out of the system any acrid matters that might be rebellious and capable of exciting irritation or feverishness; having, moreover, unloaded the bloodvessels of some of their watery and solvent elements by the same remedy; we may now have recourse to our means of *alleviating the local distress*, in other words, of soothing and healing the eruption, subduing the pruritus, and arresting the morbid discharge. We can do all this by the benzoated ointment of oxide of zinc, rubbed down with spirits of wine in the proportion of a drachm of the latter to an ounce of the former. This ointment should be applied abundantly, and gently distributed upon the surface until every part of the eruption has a complete coating; the ointment should be applied morning and night, and if accidentally rubbed off, or used upon parts exposed to the air and friction, it may be repeated more frequently. When once applied, the ointment should be considered as a permanent dressing to the inflamed skin, and never removed until the skin is healed, unless special conditions arise which render such a process necessary. To secure undisturbed possession to the ointment, a piece of linen rag, a sheet of cotton wool, or a piece of tissue paper, should be laid over it and maintained in position by any convenient method. Thus, when the eruption covers more or less of the entire body, I have a little shirt made of old linen, with sleeves for the arms and legs, and means of being fastened closely around the legs, and, if necessary, closed over the hands and feet. This little dress is to be worn constantly, night and day, and for a week together, if necessary; it is intended as a mere envelope or dressing to the inflamed and irritated skin, and its saturation with ointment, which necessarily ensues, only contributes to its greater utility in that capacity. Where the eruption is chiefly confined to the arms or legs, linen sleeves, with or without cotton-wool, will be sufficient for the purpose. On the face no other covering than the ointment is necessary, but the latter should, therefore, be used the more largely; and sometimes in this situation, small pieces of thin tissue paper, of convenient size and form, laid on the ointment, are very serviceable.

When the oxide of zinc ointment is employed in the manner now described, the formation of crusts on the eruption is prevented, in consequence of the exclusion of the atmosphere, and the consequent absence of desiccation. And when crusts are already formed, the object to be attained is, to soften the crusts by saturating them thoroughly with the ointment, and then, by gentle friction, to displace them, and substitute a thin stratum of the ointment in their place. When the eruption passes from the acute into the chronic state, and the process of exfoliation of the cuticle is active, gentle friction of the skin with the ointment is even more desirable than in the acute

stage of the disease, and is, at the same time, very grateful to the little patient. On the scalp the ointment should be applied in the direction of the hair, to avoid matting, and as soon as the oozing of ichorous discharge has somewhat subsided, the hair should be gently brushed. I am rigorous in enforcing the non-disturbance of the ointment, but sometimes my *aides* carry their instructions beyond the proper point, and accumulate the ointment too thickly over a given part, retaining thereby the secretions, and interfering with the cure; in this case, if the finger be pressed upon such an accumulated plate of the ointment, the morbid fluids will be seen to ooze up between its chinks or around its edges, and the source of evil is detected. When such an occurrence takes place, the whole of the ointment should be carefully washed off the part with the yelk of egg, and after drying the skin, fresh ointment should be applied. This excessive accumulation of the ointment takes place the most frequently on the scalp, encouraged by the matting of the hair, a reason for keeping the hair brushed whenever the nature of the eruption permits.

Another of my instructions is to avoid washing the inflamed skin; it may be wiped with a soft napkin, to remove exudations or secretions, but washing is unnecessary, indeed injurious, as tending to irritate the skin and increase the pruritus and inflammation afterwards. While the washing lasts, and the irritated skin is softened by the water, the part is relieved and comforted; but the drying which follows after more than avenges the temporary solace of the ablution. On the same principle, I never order or recommend lotions in this eruption.

In cases of *chronic eczema infantile*, that is, in pityriasis capitis and psoriasis partium aliarum, the stimulant properties of the nitric oxide, and nitrate of mercury ointments may be brought into operation; the former is specific for pityriasis capitis, in the proportion of one part to three of lard; and the latter, variously diluted from one part in eight to equal parts, may be used for the chronic eczema or psoriasis of other parts, particularly of the eyelids. But even in the chronic state of the disease, the benzoated zinc ointment will be found to be an invaluable and indispensable remedy. In the parched state of skin left by the chronic disease, glycerine may be found of use as an emollient, but when any inflammation exists, it generally proves irritant, as compared with the zinc ointment.

We now come to the remaining indication in the treatment of eczema infantile, namely, *restoration of power;* in other words, to correct malassimilation, and restore the blood to its normal and healthy condition. For this purpose, the great remedy is that admirable alterative-tonic, arsenic. It is remarkable how well infants of the earliest age bear this medicine, and how rapidly in them it exerts its tonic and bon-assimilative effects. As an effective, harmless tonic, arsenic stands alone, and without its peer in this vexatious disease; indeed, in eczema infantile, it is specific; it cures rapidly, perfectly, unfailingly; it would be difficult to say as much for any other medicine in relation to any other disease; and I pronounce this eulogium on arsenic after a large

experience. The preparation of arsenic which I select, is Fowler's solution, the dose two minims to an infant from a month to a year old, repeated three times in the day, with or directly after meals; and as mal-assimilation is always attended with anæmia, in a greater or less degree, I conjoin with the two minims of Fowler's solution, fifteen of vinum ferri, my formula being as follows:

℞.—Vini ferri,
Syrupi tolutani, āā ℥ss.
Liquoris potassæ arsenitis, ♏xxxij.
M. Aquæ anethi, ℥j.

The dose of this mixture is one drachm, with or directly after meals, three times a day.

With these three remedies, namely, the calomel powder, the benzoated ointment of oxide of zinc, and the ferro-arsenical mixture, representing, as they do, the three indications for treatment of eczema infantile, I regard the cure as certain and rapid, and failure impossible; and if success were not complete, I should seek for the cause, not in the remedies, but in the mode of administering them. So confident am I of success, that I have often undertaken the treatment of this disease without seeing the patient, and at hundreds of miles distance, being satisfied, for my only aid, with the vigilance of an intelligent mother or nurse. I have never known any evil effects, present or future, result from this treatment, but I never fail to give strict injunctions, that *if the medicine appear to disagree with the child, it should be given less frequently*, say twice, instead of three times a day, *or suspended instantly*, if the child appear ill; moreover, that in the event of such an occurrence, the calomel powder should be immediately resorted to. The period of continuance of the remedies must be left to the judgment of the medical man; the treatment sometimes occupies three weeks, and sometimes more. And if a recurrence of the eruption take place, the treatment must be recommenced, and conducted on the same principle, and with the like precautions.

The diet of the child while under this treatment must be carefully inquired into; it should be good, wholesome, and nutritious; the leading constitutional indication is to nourish properly; and this idea should be carried out in the food as well as in the medicine. I find the juice of meat of great value in these cases, and it may be given either alone, as beef or mutton tea, or mixed with the other food.

The consideration of diet and food brings me to an important dietetic medicine which is of great value in this disease, when the latter is attended with emaciation, and in the chronic stage; in acute cases, it is less applicable: I mean the *cod-liver oil*. The child will often take the oil greedily in its natural state, and its good effects on nutrition are speedily made apparent; it may be given with safety to the youngest infant. In children somewhat older, and particularly in chronic cases, the cod-liver oil chocolate becomes a useful ingredient of diet; and it is in these latter, more particularly, that the chocolate was found so successful in the hands of my brother among my poor patients, as already mentioned. When I have wished to avail myself of the excellent properties of the cod-liver oil in conjunction with

arsenic, I have often found the following formula a convenient vehicle for its use:

℞.—Olei jecoris aselli, ℥ij.
Vitelli ovi, j.
Liquoris potassæ arsenitis, ♏lxiv.
Syrupi simplicis, ℥ij.
M. Aquæ fontanæ, q.s. ad ℥iv.

A drachm a dose, three times a day, with or directly after meals. When eczema infantile is complicated with diarrhœa or congestion of the mucous membrane of the air-tubes or lungs, the arsenical remedy should be instantly suspended, the calomel powder immediately administered, and ordinary antiphlogistic remedies adopted; magnesia and aromatic confection for diarrhœa; and ipecacuanha for the bronchitic or pulmonary congestion. Where the air-tubes are loaded with phlegm, an emetic is sometimes useful; and a poultice to the chest and abdomen will be found to be a valuable adjuvant.

In concluding my observations on eczema infantile and its treatment, I must repeat, that I know of no cases in the whole catalogue of the diseases of the human frame, in which the disease itself is more unpromising in appearance and distressing in its effects, and at the same time more amenable and tractable under the treatment now laid down, than this disease.

ECZEMA CHRONICUM—VEL PSORIASIS.

Whenever, from the continuance of any of the preceding forms of eczema for a lengthened period, either as a result of the severity of the original disease, or of mismanagement in its treatment, the surrounding skin is irritated by the ichorous discharge secreted by the excoriations, the deeper textures of the integument become more or less involved in the morbid action. The skin is inflamed and swollen, the subcutaneous cellular tissue becomes dense and infiltrated, new excoriations, with deep and extensive chaps and fissures, are produced, and more or less ichorous secretion is poured out by the diseased structure. The chronic form of eczema is most frequently met with in the flexures of joints, more rarely it extends over a considerable surface, and occasionally involves an entire limb. It is obstinate and troublesome under treatment, and frequently endures for months or even years.

Sometimes the secretion diminishes in quantity, and concretes into thin, yellowish, lamellated scabs, which fall off from time to time, and are replaced by successive deposits of thinner scabs. The surface upon which they rest becomes less red and hot, and the diseased skin appears to be gradually progressing towards cure, when suddenly the redness and tumefaction return, and a fresh discharge is produced. In this manner, fresh and fresh outbreaks occurring at intervals, the morbid action is kept up for months, and often for years.

In another variety of psoriasis the eruption forms a circumscribed patch, which is callous and dense, sometimes thin and dry like parchment, sometimes thick like buckskin, and sometimes horny and warty in character from hypertrophy of the papillæ of the skin, and the

consequent production of the cuticle in sheaths, which are vertical to the surface. All discharge has long since ceased on these patches, and in their pathological nature they have degenerated into dry, thickened, callous erythematous patches, generally smooth on their surface, or only roughened with epidermic exfoliations, but susceptible at any time of becoming inflamed, and chapped, and pouring out an ichorous exudation. It is these patches that realize the true idea of psoriasis more fully than any other form of eruption.

Chronic eczema is attended with severe itching, which is only relieved when a free ichorous discharge is emitted, and which commonly follows the act of rubbing and scratching, or when the scratching is succeeded by the escape of a little blood. Sometimes the scratching exasperates the irritation, and the whole nervous system is thrown into a state of great excitement. Moreover, in certain situations, the pruritus is sometimes unbearable, and almost maddening, exciting the wildest paroxysms; as, for instance, when it occurs in the vulva, upon the scrotum, or around the anus.

Occasionally the irritation of chronic eczema takes on the character of cutaneous neuralgia, and then the sufferings of the patient are very severe. I once saw a distressing case of this kind, where the chief seat of the eczematous disorder, and of the neuralgia, was the axillæ. As may be inferred, the constitution of the patient in these cases is highly nervous; the abnormal nervous susceptibility sometimes resulting from idiosyncrasy, and sometimes from the exhaustion occasioned by previous or long-continued illness.

LOCAL VARIETIES.

ECZEMA CAPITIS.

Syn. *Vesicular scall; Running scall; Erythema ichorosum; Dartre squameuse humide; Porrigo asbestina. Tinea amiantacea; Tinea furfuracea;* Alibert. *Tinea granulata.*

Eczema capitis[1] presents the general characters of eczema rubrum, with excessive ichorous discharge; and sometimes, in an aggravated form running into eczema impetiginodes, complicated by its special seat of development on the hairy scalp, from which it is apt to extend to the forehead and temples, the ears, and nape of the neck. The scalp is red and swollen, and the cuticle cracked in every direction, and more or less raised from the inflamed surface beneath by ichorous secretion. The quantity of ichorous fluid is excessive, filling the hair with moisture, and distilling in little rills from beneath it; at first it is transparent and colorless, but viscous and tenacious; by degrees it becomes opaline and milky (*tinea mucosa*), and later in the progress of the disease, semipurulent, with the addition, here and there, of an admixture of blood. The hair soon becomes matted and agglutinated by the morbid secretions, and the latter dry up into thick, greenish, and yellow crusts, blackened here and there by the presence of blood.

[1] Portraits of Diseases of the Skin, Plate IV., AX.

Wherever the crust breaks, new discharges issue from the openings, and still further augment and consolidate the mass, reeking and fetid with the accumulated secretions. The odor of the head when in this state is valerianic and peculiarly offensive, and nothing can be effected in the treatment of the disease until the filthy mass is removed.

When the hair is sufficiently short from the first to prevent the excessive accumulation here described, a curious phenomenon occasionally presents itself. The crust having become desiccated over the surface of the scalp, necessarily contracts, and the contraction results in the fracture of the crust into polyhedral fragments or divisions, which resemble so many small islands, covering the head; each of these little islands has its own proper portion of hairs, and these hairs, by the further contraction of the fragment, are drawn together, and form a conical pencil. All the hairs of the head may in this manner be collected into conical bundles, and present a very singular appearance. The next thing that happens is equally curious. The ichorous secretion flows down these cones, and drips from their extremity; and when the secretion subsequently dries, each cone is seen to be inclosed in a thin, transparent, glistening sheath, the hairs included within the sheath having the appearance of asbestos. Rayer compares them very aptly to the "pellicles that envelop the sprouting feathers of young birds." This is the origin of the terms *teigne amiantacée* and *porrigo asbestina*, bestowed by Alibert on eczema capitis, and is another instance of the extreme absurdity of dermatographical nomenclature.

At a later period of the complaint, when the morbid secretions have diminished in quantity, the crust which is produced is of a dull gray color, and more friable than the crust previously described. This grayish crust, broken into fragments, or rather into *granules*, and dispersed among the hair, has been compared to particles of mortar, and suggested the term *tinea granulata*. Sometimes these little masses or granules, being pierced by the hairs, have the appearance of being threaded on them like beads upon a string.

Eczema capitis is apt to become chronic, and, having ceased to pour out an ichorous secretion, produces a desquamation of furfuraceous scales in large quantity; this is *tinea furfuracea*. Later still, the erythema and parched state of skin remaining, the desquamation is mealy instead of being furfuraceous or branny, and the disease has become *pityriasis capitis*.

Not uncommonly the persistent inflammation of the skin, which accompanies chronic eczema, causes destruction of the hair, and produces partial alopecia. Sometimes, but rarely, the vitality of the scalp is so much injured that the growth of the hair is permanently arrested. At all stages of the disease the lymphatic glands of the occipital, auricular, cervical, and sub-mental regions are apt to enlarge and become painful; sometimes to suppurate.

Eczema faciei.—Eczema, when it attacks the face, is most frequently met with on the forehead, the chin, the eyelids and cheeks, and around the mouth. It presents no special features calling for attention, and is apt, when it attacks the eyelids and mouth, to pass into the chronic form.

ECZEMA AURIUM.—Eczema makes its attack upon the ears at all periods of life, and in both sexes, and is not unfrequently met with in children during dentition. The ears affected by this disease are red, swollen, and tender, and are covered with excoriations and chaps, which pour out a profusion of ichorous fluid. The discharge spreading upon the inflamed surface desiccates into a yellowish and brownish lamellated crust, which is constantly augmented by fresh secretion. From the pinna the inflammation often extends into the meatus, and gives rise to great pain. Small subcutaneous abscesses form in the integument around the ears, and the neighboring lymphatic glands enlarge.

When eczema aurium assumes the chronic form, the quantity of secretion becomes less, the incrustations are thinner and less abundant; the tissues of the ear are swollen and thickened; the meatus is constricted; the skin fissured by painful chaps; and the disease is extremely obstinate; often resisting every method of treatment, and enduring for years.

ECZEMA MAMMILARUM.—Eczema of the nipples is a somewhat rare variety of eczematous affection, and usually assumes a chronic form. It has been occasionally observed in women during suckling, but is more frequently met with in girls at puberty, in women who have never been mothers, at the critical period of life, and in old persons. It is characterized by an eruption of small vesicles, succeeded by chaps, both the one and the other exuding a considerable quantity of secretion, which desiccates into lamellar scabs and scales. The affection is attended with much itching, and the nipple is tender, and frequently bleeds on being rubbed or scratched. In the chronic form the disease is exceedingly obstinate and difficult of cure. When it occurs during lactation it is desirable that the infant should be weaned.

ECZEMA PUDENDI.—In this affection the eczematous eruption is developed upon the scrotum in the first instance, and thence extends to the neighboring parts of the thighs and to the anus; or it may commence in the latter situation, and spread to the scrotum. The disease, whatever its mode of origin, is exceedingly distressing, being accompanied by a most unbearable pruritus, which is increased rather than mitigated by the efforts of the patient to relieve himself by scratching. The vesicles burst or are ruptured as soon as formed, a large quantity of ichorous secretion is poured out, fissures and excoriations are produced, and great suffering is the consequence. Eczema in this region generally assumes the chronic form, and continues, with temporary remission in the severity of the symptoms, for months and years. It is generally met with in persons of the middle period of life.

In the female, eczema pudendi is, if possible, more painful and distressing than in the male, and is much heightened by the extension of the eruption to the mucous membrane of the vulva. The irritation is, moreover, augmented by the frequent discharge of morbid secretions from the vagina. All the functions of the region are rendered painful, the smarting is excessive, and the pruritus unbearable. Adults

are most frequently attacked with this disease, and children rarely. I have, however, seen one instance in a little girl eight years of age.

ECZEMA ARTICULORUM.—As before remarked, eczema of the flexures of the joints is a common complication of general eczema; so that where the latter is present, the thin skin of the bends of the joints is sure to be affected to a greater or less degree. In chronic eczema, again, the eruption lingers about the joints after it has disappeared from other parts of the body. And sometimes the eruption is, from the first, limited to the joints. When the latter is the case, the disease may present itself in the form of eczema simplex or eczema rubrum; and at a later period it may become a confirmed eczema chronicum or psoriasis. As eczema chronicum or psoriasis, the integument is thickened, red, dry, hot, and contracted, cracked into fissures which bleed whenever the joint is stretched, and roughened by a more or less copious laminated or furfuraceous desquamation. When eczema rubrum has got well, the skin remains congested for some time afterwards, it looks tender and wrinkled, and is covered by a thin, transparent, and polished cuticle.

ECZEMA MANUUM ET PEDUM.—Eczema of the hands and feet is similar in its characters; but, from exposure to the atmosphere, the disease is more common in the former than in the latter. The common seat of the eruption is the back of the hand, where it resembles lichen agrius, and in its chronic state becomes psoriasis dorsi manus. Eczema appears on the back of the hands in its simple vesicular form, as when excited by the sun's rays, *eczema solare;* but it is more commonly met with as eczema rubrum, with the characters common to that stage of the affection, namely, slight tumefaction, cracked, excoriated, and softened cuticle, and a profusion of transparent, ichorous, and viscous discharge, which may be seen distilling from the exposed and congested derma, and oozing from numerous smaller points, where the cuticle has been removed by friction or scratching. Later in the course of the disease the eczema becomes chronic, the ichorous discharge diminishes in quantity, or ceases altogether, and the surface becomes coated over with thin crusts and scales.

Not unfrequently the disease is met with on the hands under the form of *eczema digitorum*, appearing towards the end and upon the tips of the fingers, and attended with much suffering from itching, tingling, smarting, burning, and extreme tenderness. It commonly happens that no trace of eczema or eruption exists upon any other part of the body, and the small extent of the disease becomes remarkable. Sometimes a single finger only is attacked, sometimes the same finger on both hands; and although trifling in itself, it is a source of great annoyance to the patient, not only from the pain which it excites, but from its unsightly appearance and obstinate persistence. This troublesome eruption commences with a feeling of itching in the part; when scratched or rubbed there is a sensation of hard granules under the skin; and, upon close inspection, the cuticle will be seen to be studded with dark, transparent, circular spots, evidently drops of effused lymph, which, from the thickness of the epidermis, are unable

to arise it into vesicles. On the backs of the fingers and around the nails, true vesicles are formed, which are sometimes numerous, and sometimes, by communication with each other, raise up the cuticle to a considerable extent, and finally cause its exfoliation. In mild forms of the complaint, the fluid of the vesicles is absorbed, and the cuticle desiccates into a thick, yellowish, and horny layer; sometimes the disease passes into the chronic form, the skin becomes thickened, dry, and cracked, the cuticle exfoliates repeatedly, and the morbid action is perpetuated as a chronic eczema digitorum. When the disease fixes on the thin skin at the ends of the fingers, the nail is sometimes destroyed.

Eczema rubrum dorsi manûs disputes with lichen agrius dorsi manûs, the popular titles of *grocers' itch* and *bricklayers' itch;* and it is often a point of nice distinction to determine whether to call a given eruption, eczema or lichen agrius, lichen eczematosus, as it might with great propriety be called.

Diagnosis.—The different varieties of eczema present differences of character which are peculiar to themselves, and must be borne in mind in our endeavors to establish the diagnostic signs of the disease. Thus, in eczema simplex we find clusters of minute vesicles in great numbers, and without accompanying redness; in eczema rubrum the vesicles are surrounded by inflamed areolæ of considerable extent, and mingled with moist excoriations; in eczema impetiginodes many of the vesicles contain a purulent fluid, others are ichorous, and others, again, are supplanted by excoriated patches; in the latter stages of all the above varieties, we find lamellated scabs and incrustations of variable thickness; and in eczema chronicum, or psoriasis, we have chaps and fissures pouring out an ichorous fluid, and, at a later period, copious desquamation. Moreover, eczema is frequently seen as a complication of scabies, and is itself complicated with the pustules of impetigo and ecthyma.

Eczema simplex is not unfrequently confounded with scabies, and from the similarity of some of their characters, this mistake is likely to occur. In both, there are vesicles; in both, the eruption is developed without redness; both are situated in the flexures of joints, between the fingers, &c.; and both are accompanied with pruritus. But, upon careful examination, considerable differences will be detected between the two diseases.

Simple eczema is likely to be confounded with sudamina, with which its vesicles bear considerable analogy. The characters by which it may be distinguished are, that, in the latter, the vesicles are of larger size than those of eczema, being equal in bulk to a millet seed, while those of eczema rarely surpass the head of a small pin. The vesicles of sudamina are scattered and discrete; those of eczema, confluent and aggregated. The former are associated with profuse perspiration, which is not the case with eczema. Moreover, sudamina occur without preceding irritation of the skin, and their presence gives rise to no abnormal sensations.

Eczema impetiginodes is liable to be mistaken for scabies and impetigo.

Scabies complicated with pustules, as it sometimes occurs, presents several points of resemblance with eczema impetiginodes, but the other characteristic signs, and the presence of a parasitic animalcule, are absent. The pustules of scabies, again, contain pus from their first appearance. In impetigo, the pustules never contain lymph; they are larger than the eczematous lymph-pustules, unmixed with vesicles, and confined to a small extent of surface. Again, the hardened coverings of the excoriations of eczema are thin scabs, while those of impetigo are dense and thick greenish-yellow or brownish crusts.

Eczema chronicum presents many points of resemblance with lichen agrius; for instance, the chaps and fissures, the ichorous secretion from the excoriated surfaces, and the copious exfoliation of scales. Indeed it is only by means of the previous history of the eruption that their diagnosis can be determined. The result of the diagnosis is, however, of little consequence, as both, at this stage, come under the designation of psoriasis.

Eczema capitis is sufficiently distinguished from other diseases of the scalp by the characters which have been already indicated.

Eczema aurium is distinguished from erythema intertrigo by the absence of all trace of vesicles in the latter, and by its sole appearance in the cleft behind the ears. It is attended with chapping, and by the effusion of ichorous discharge. The same characters serve to establish the diagnosis between eczema mammillarum, pudendi, and articulorum, and erythema of those regions.

Causes.—Eczema is apt to occur either symptomatically, as a consequence of some constitutional disturbance, or as an effect of the application of local irritants to the surface of the skin. Of the former kind are the changes which take place in the system under hygienic influences, as during the spring and summer season of the year, particularly when accompanied by atmospheric vicissitudes; affections of the digestive system, as dentition, the irritation produced by unsound milk in infants at the breast, and stimulating and improper food and drinks in persons of all ages; affections of the uterine system, as amenorrhœa, dysmenorrhœa, utero-gestation, and the critical period of life; the cessation of lactation; affections of the nutritive system, as scrofula; and affections of the nervous system, as mental emotions, particularly of the depressing kind. The local causes of the disease are heat and cold, together with friction, and irritation of the skin produced by whatever cause. Thus, occasionally, we find eczema resulting from exposure to the sun's rays, a variety which has been denominated *eczema solare*. It not unfrequently attends the inflammation produced upon the skin by the irritation of a blister, or by the application of the compound sulphur ointment, or of a pitch plaster. A variety is also met with affecting the hands of persons who are called upon, in the ordinary occupation of life, to manipulate dry and powdery or stimulating substances. In the same category must be enumerated the transmission of eczema, by contact, from one person to another, the discharge from the vesicles in this case not effecting any specific action, but merely acting the part of a local irritant. Eczema is developed in females more frequently than in males, an

observation which must be referred for its explanation to the greater cutaneous susceptibility of the former than of the latter sex. Again, different parts of the body exhibit a greater or less disposition to the invasion of the disease at different periods of life; hence it is well remarked by Rayer, that in "infancy and youth, eczema appears more particularly on the head; in riper years, on the breast and belly, but especially on the genital organs; and in advanced life, on the lower extremities, and about the margin of the anus." In some instances the eruption has been observed to be hereditary in its origin, being developed in the infant soon after birth, and after the previous occurrence of the disorder in the parent.

PROGNOSIS.—Eczema acts very commonly as a safety-valve to the health of the system, and the discharge by which it is accompanied must be checked very guardedly, and not before a counteraction, either on the skin or on the alimentary mucous membrane, has been established by art. In most instances the eruption is difficult of cure, not so much from any pathological peculiarities which it presents, as from the circumstance of its being symptomatic of constitutional disturbance, or visceral disease, which must be removed before the local affection can be conquered; indeed, it usually happens that the cure of the constitutional disorder is followed by a spontaneous disappearance of the eczema.

TREATMENT.—Eczema must be treated in accordance with the principles laid down in the chapter on general therapeutics, and the three indications therein announced must be observed. *Elimination* must be effected by means of aperients, the compound colocynth pill, with soap or henbane, and if thought necessary, calomel or blue pill; sulphate and carbonate of magnesia, with nitrate of potash and mint water, or any more convenient form. If there be fever, effervescent salines are the proper remedy; if there be an excess of acid salts in the system, with symptoms of rheumatism, neuralgia, or gout, then alkalies with bitters should be given, and a grain of the acetous extract of colchicum conjoined with the aperient pill.

Restoration of power, the second indication, is to be attained by means of tonic remedies, one while conjoined with alkalies, if the acid diathesis prevail; and then with the mineral acids, nitromuriatic and sulphuric. If there be debility, with languor, lassitude, and depression of spirits, the plan of bitters with acids is the correct one to pursue. Later in the course of the disease, when it has proved rebellious to treatment by general remedies, or has passed into the chronic stage, and is established as a chronic disease, we may have recourse to the specific powers of arsenic. Three to five minims of Fowler's solution, or six to ten of the acid solution of De Valangin, may be given three times a day, with meals; and in very chronic cases, when the conjunction of mercury and iodine with arsenic is thought desirable, ten minims of Donovan's solution may be taken with meals, also three times a day. When chronic eczema resists every other mode of treatment, it may be assailed by the tincture of cantharides exhibited in combination with compound tincture of camphor

and bark. In these very obstinate cases the bichloride of mercury in tincture of bark has sometimes been found of great service.

In the exhibition of arsenic, the known irritative effects of that medicine when taken for too long a time, in excess, or by persons intolerant of the remedy, must be borne in mind and carefully watched, and the instant any of these symptoms occur, the remedy must be suspended. The same remarks apply to the administration of cantharides. The rule that I lay down for the guidance of my patient while taking arsenic is simply this: *If you feel ill from any cause whatever, think you have taken cold, or have any pains in your stomach, immediately stop the medicine until those symptoms have subsided; and then resume it as before.* By obeying these instructions the patient will avoid all danger from harm, while taking an excellent medicine.

The third indication, the *alleviation of local distress*, in other words, the local treatment, brings us to operate with those topical applications which are known to soothe a part in the state of inflammation; the first of them is water-dressing, the second a soothing unirritating ointment, such as the benzoated ointment of oxide of zinc, rubbed down with spirits of wine, a drachm of spirit to the ounce, and perfectly fresh. When the water-dressing is used, the intention should be to reduce the local congestion and suffering, and encourage discharge. As soon as that end is attained, we must endeavor to arrest discharge, and heal the excoriated skin; then is the time for the oxide of zinc ointment, and then it is unfailing, if properly applied.

In eczema simplex, the lotio plumbi may be found useful, and if there be much pruritus, a lotion of sesquicarbonate of ammonia, a drachm to the half pint; an emulsion of bitter almonds with hydrocyanic acid; a lotion of the liquor ammoniæ acetatis with camphor mixture; a liniment of olive oil and lime-water with liquor plumbi; simple cerate with camphor; the oxide of zinc ointment, with spirits of wine or camphor, or the unguentum plumbi compositum.

In eczema rubrum and eczema impetiginodes, after the heat and inflammation of the skin have been sufficiently reduced by water-dressing, the benzoated ointment of oxide of zinc should be applied somewhat thickly over the whole surface, so that every hollow and recess may receive its share, then a piece of linen rag thinly spread with the same ointment, or a sheet of cotton-wool, should be laid over the part. This kind of dressing should be repeated once or twice a day, and to uncovered parts as often as the ointment may be accidentally disturbed or rubbed off. At first, and while the skin is in a state of inflammation, the ointment cannot be applied too lightly; later in the course of the disease a little friction may be used; and later still, when crusts have formed on the eruption, a gentle effort may be made, while applying the ointment, to displace the crusts with the finger during the act of friction. Throughout the whole period of treatment of the eruption by ointment no water should be used, and consequently no washing. Occasionally, when the crusts and ointment have accumulated unduly, the part may be sponged with warm water, and immediately after anointed afresh, but generally, washing is mischievous rather than beneficial.

If heat and inflammation occur during the treatment of the part by inunction, there is nothing to prevent the application of strips of rag wetted with evaporating lotion externally to the covering which keeps the ointment in its place; and other means of relief, such as position or fomentation, may also be adopted. Sometimes when the tone of the skin has been much lowered by the continuance of the disease, or the prolonged use of water-dressing, and particularly when the lower extremities are the seat of the eruption, a bandage, to make a firm and equable pressure on the surface of the limb, may be used with advantage.

In chronic eczema other topical remedies are required, one while to relieve pruritus, and another while to exert a discutient action on the affected part. The juniper tar-ointment, considerably diluted, is an excellent anti-pruritic remedy, while, stronger, or of its full strength, it is powerfully discutient. Among the best of the discutient remedies are the ointments of the nitric and hydrochloric salts of mercury, variously diluted; for example, the nitric oxide of mercury, unguentum hydrargyri nitratis, and unguentum hydrargyri ammonio-chloridi. In some forms of chronic eczema one or other of these ointments is specific; for example, the unguentum hydrargyri nitrico-oxydi diluted to the extent of one part in four, in pityriasis capitis; the unguentum hydrargyri nitratis, one part in eight, in psoriasis palpebrarum, &c.

Sometimes eczema rubrum and eczema impetiginodes, when of long continuance, or when the water-dressing or poultice have been unduly prolonged, become excessively tender, so tender, in fact, as to be irritated by the mildest application. I have such a case in remembrance, wherein the disease of the skin was rendered most distressing by its association with cutaneous neuralgia; and I have since seen several cases of a similar kind. In this morbidly sensitive state of the skin and of the eruption, I have found no remedy act so well as a solution of nitrate of silver in spiritus ætheris nitrici, in the proportion of one grain to the ounce.

SUDAMINA.

Syn. *Miliary vesicles. Miliaria. Miliary eruption. Hydroa. Herpes miliaris. Die Friselblattern; die Schweisblattern*, Germ.

Sudamina are small prominent vesicles, of a rounded form, and about equal in size to millet seeds. They are transparent at first, and have a pinkish hue (miliaria rubra), but at the end of twelve or twenty-four hours, become opaque and milky (miliaria alba), and resemble small pearls scattered on the skin. Their period of duration is three or four days; they then shrivel and dry up, and form thin scabs, which are thrown off by desquamation. By successive attacks the eruption may be continued for several weeks.

Sudamina may be situated on any part of the body; their most frequent seat being the trunk, where they usually occupy a district of considerable extent; and select by preference the side of the thorax, the axillæ, and the adjacent part of the inside of the arm; being no doubt encouraged by the heat of this region. They are always discrete,

though sometimes very numerous, are preceded by no signs, or by very little indication of cutaneous irritation, and by trifling redness of the skin.

Sudamina have received their name from being always associated with excessive heat of the skin, and often with profuse perspiration. Hence they are occasionally met with in eruptive fevers, namely, in rubeola, scarlatina, and variola. They also accompany simple, remittent, and typhoid fevers, and most inflammatory affections accompanied with profuse perspirations, as acute rheumatism. From the size which they usually present, namely, that of a millet seed, they have been termed *miliary vesicles*, hence the specific designation attached to certain diseases, as erythema miliare, implies a complication by these vesicles. Sudamina are most frequently observed in persons possessing a thin and irritable skin, and during the summer season.

Since the days of Sydenham, who advocated so powerfully the adoption of a cool temperature and cooling regimen in fevers, sudamina have become rare; but previously to his time they were exceedingly frequent, and, from their connection with fever, were regarded as a specific disorder, preceded and accompanied by severe and dangerous fever. This fever was termed miliaria, and for many years was regarded as a dangerous and fatal disease, spreading like an epidemic, and destroying multitudes of lives. But, as I before remarked, since a more rational method of treatment has been employed in medicine, miliary fever has ceased to exist. Bateman remarks, "It is scarcely necessary now to enter into any detail of proofs that the miliary eruption is the result of a highly heated and perspiring state of the skin, and that in its severe and fatal degree it is solely the effect of a stimulating regimen in a confined atmosphere. The almost total annihilation of the disease, of late years, since the general adoption of a better practice, is of itself unequivocal evidence of its origin." "Hippocrates, whose mode of treatment in febrile diseases was not calculated to produce excitement, has once or twice, but casually, mentioned the miliary eruption. And again, at the latter part of the seventeenth century, when, in the practice of the majority of physicians, the miliary fever was a frequent and fatal occurrence, Sydenham witnessed no such fever; but mentions the occasional appearance only of miliary vesicles, which he ascribes to their proper cause."[1]

"Among the various circumstances," continues Bateman, "under which the miliaria was formerly excited, the puerperal state appears to have been most frequently the source of it; insomuch that it was first described as an epidemic among puerperal women. This is sufficiently accounted for by the treatment which was unhappily pursued during the confinement after childbirth, and of which an impressive description is given by Mr. White. For not only was the mother immediately loaded with bedclothes, from which she was not allowed to put out 'even her nose,' and supplied with heating liquors from the spout of a teapot; but to her room, heated by a crowd of visitors and

[1] Synopsis, edited by Dr. Thomson, p. 348.

a fire, all access of air was denied, even through a keyhole. From these causes fever was almost necessarily induced, with the most profuse sweats, oppression, anxiety, and fainting; and these again, were aggravated by spicy caudles, spirits, opiates, and ammoniacal medicines. That numbers should perish under such management, with every symptom of malignity, and that many who survived it should escape with broken constitutions, will surprise no person who is acquainted with the baneful influence of overexcitement in febrile complaints."[1]

DIAGNOSIS.—The diagnosis of miliary vesicles is not difficult; their being discrete, though numerous; their form and size; their occurrence chiefly on the trunk of the body; the absence of inflammatory redness of the skin; and their association with constitutional disease, and generally with a clinical state of the patient, sufficiently distinguishing them from the smaller, itching and tingling, clustered vesicles of eczema. The seat of eczema, again, is so different, and the inflammation of the skin which generally surrounds the vesicles. The vesicles of herpes are too large, and the inflammation at their base too conspicuous to be confounded with sudamina.

The *causes* of sudamina have been sufficiently indicated in the preceding description, and the *prognosis* must depend upon the disease with which they are associated, and of which they are simply symptomatic.

The *treatment*, again, applies to the fever which they accompany. The vesicles are too insignificant to call for the use of therapeutic measures.

CHAPTER VIII.

DISEASES ARISING FROM GENERAL CAUSES.

IMPETIGINOUS OR PUSTULAR ERUPTIONS.

UNDER the influence of a degree of inflammation of the derma, for the most part greater, at least at its commencement, than that which exists in the eczematous group of diseases, the inflamed derma gives rise to the formation of pus; the pus occupying the surface of the derma, and producing an elevation of the epidermis to a limited extent. This irregularity of the surface of the skin, namely, an elevation of the epidermis consequent on the presence of pus, is termed a *pustule*, and this is the only accurate sense in which that term can be employed. There is a wide distinction between a vesicle and a pustule, when these two pathological forms present their typical characters; but it not unfrequently happens, that, in consequence of a reparative action set up in the vesicle, pus is produced upon its dermal

[1] Synopsis, edited by Dr. Thomson, p. 350.

base, and, mingling with the lymph, constitutes a semi-purulent, and subsequently a purulent or pustular vesicle. In such a case it is necessary to remember that a true pustule contains pus from the first moment of its formation, and, by this circumstance, is essentially distinguished from a vesicle.

It is requisite, at the outset of our study of cutaneous diseases, to be precise in our definitions, and to draw as broad a line as possible between the various pathological forms which we are desirous of characterizing. Scarcely any word in medical nomenclature has been used more loosely than the term pustule. At one time it was employed to signify a papula, at another a vesicle.[1] Willan employed it, with the characters above stated, as the type of his fifth order, *pustulæ;* and in this sense it has been subsequently adopted by successive dermatologists.

The diseases which I propose to consider under the definition above given, are two in number, namely,

Impetigo, Ecthyma.

The order Pustulæ of Willan embraces five diseases, two of which, had he lived at the present time, would, I am convinced, have been excluded by himself, namely porrigo and scabies. The genus Porrigo of Willan contains diseases of the most opposite kind, and has been the source of much confusion, so much, indeed, that it would be well that the term should, for the future, become obsolete and forgotten.[2] Scabies, again, is a disease possessing several elementary forms of which both vesicles and pustules are accidental, and only occasionally present; the pustules, when they exist, belonging to ecthyma. Variola, as placed by Willan in the order pustulæ, is forcibly torn from all its natural affinities, and for this reason I have thought it correct to transfer it to the group of eruptive fevers. Rayer admits no less than ten genera of pustular inflammations, for four of which he is indebted to variola, namely, variola, varicella, vaccinia, and

[1] Riolanus informs us that in his time (the sixteenth century), cutaneous diseases were grouped into three genera, according to their prominent characters in reference to smoothness, color, and magnitude; but as this arrangement excluded diseases of the hair, others preferred dividing them into pustules, deformities, and tubercles. The genus pustulæ comprehending all eruptions attended with roughness of the skin, whether pimples, vesicles, proper pustules, or scales.

[2] The diseases marked by roughness of the skin (asperitas cutis), the group of pustulæ, present as a secondary group, scabies, an eruption attended with much itching, and exciting the "desiderium scabendi," hence its name. Scabies, again, has two species, humida et sicca; scabies humida is the representative of eczema; and scabies sicca, which, besides being dry, is rough and pimply like goose-skin, seems to correspond with lichen. But scabies sicca has two sub-genera which are scaly, and are therefore named psora, the parent of the psoriasis of the present time; and psora is subdivided in reference to the bulk of its scales into psora porrigo, and psora lepra—the scales of the former being furfuraceous, and of the latter as large and thick as fish-scales. We are thus enabled to trace the proper signification of porrigo; it is a dry furfuraceous eruption attended with itching; its furfuraceous quality being indicated by the first two syllables of the word; "a porro, quia ut porrum in tunicæ involucra, ita cutis velut in squamas resolvitur;" and its pruritic character by the terminal syllable, "quasi prurigo." Porrigo, therefore, corresponds with pityriasis; while porrigo capitas is further named tinea, because the skin seems eroded like garments attacked with the moth.

vaccinella. There could have been no objection to thus establishing a distinct group of variolous affections, indeed, some benefit might have flowed from such an arrangement, but the possible advantages are immediately destroyed by the companionship with which he has leagued them. Thus, from the highly inflammatory and contagious fever of variola, we pass on immediately to three forms of disease of the face, two of which are affections of the sebiparous glands and hair follicles, namely, rosacea, acne, and sycosis; next in order follows impetigo; then favus, a peculiar disease of the hair follicles; and lastly, ecthyma.

The genera impetigo and ecthyma constitute the two essential forms of pustules indicated by Willan, namely, psydracia and phlyzacia, the former being a psydracious (*ψυχρὰ ὑδράκια*, frigidæ guttulæ) pustule, that is, "a small pustule, often irregularly circumscribed, producing but a slight elevation of the cuticle, and terminating in a laminated scab. Many of the psydracia usually appear together, and become confluent; and after the discharge of pus, they pour out a thin, watery humor, which frequently forms an irregular incrustation." The latter, a phlyzacious (*φλύζειν*, to be hot) pustule; that is, one, "commonly of a large size, raised on a hard, circular base, of a vivid red color, and succeeded by a thick, hard, dark-colored scab." The achor and the favus of Willan are pustules developed around the mouths of the hair follicles on the scalp.

IMPETIGO.

Syn. *Psydracia.* *Ecpyesis impetigo*, Mason Good. *Crusted tetter, or scall.* *Dartre crustacée*, Fran. *Kleienaussatz*, Germ. *Melitagra*, Alibert.

Impetigo[1] (Plate X., A–F) is a non-contagious inflammation of the skin, assuming usually a subacute type, and characterized by the eruption of small, hemispheroidal, or flattened pustules, with but little inflammation at their base. The pustules are for the most part arranged in thickly set clusters, which occupy a small extent of surface; at other times they are distributed more or less generally over the surface of the body. Each pustule attains its full development and bursts, in the course of two or three days, terminating in a rough, yellowish, and transparent crust, of considerable thickness. The disease occurs frequently in successive crops, is attended with trifling or no constitutional symptoms, and endures from three to four weeks to as many months, and even years.

The mode of distribution of the pustules has given rise to the division of the disease into two principal varieties, namely—

Impetigo figurata,
" sparsa.

To these have been added, by Willan, other varieties, respective of degree of severity or locality, which it would be more desirable to

[1] Impetigo, *ab impetu*, according to Pliny. Impetu agens.

consider as sub-varieties under the above heads; one of these, impetigo rodens, I omit altogether from consideration, since the disease described by Bateman under this name is evidently a syphilitic ulceration of the skin, and not an impetigo. The remaining varieties are—

Impetigo scabida,
" erythematica,
" capitis.

IMPETIGO FIGURATA.

Syn. *Dartre crustacée flavescente*, Alibert.

This variety (Plate X., A B) is characterized by the occurrence of the eruption upon a distinctly circumscribed and defined spot, which is usually circular on the face and upper parts of the body, and oval on the lower extremities. The disease commences with the appearance of one or several small patches of redness, which remain distinct throughout the progress of the eruption, or subsequently unite with each other, and constitute a single patch; or it may appear at once as an inflamed patch of considerable size. Upon this inflamed patch a crop of small yellow pustules are developed, which rise but slightly above the surface of the skin, and are collected into thickly set and sometimes confluent clusters. At the end of one, two, or three days, the pustules burst and discharge their contents, and the effused fluid desiccates into thick, brittle, greenish-yellow colored crusts, resembling a patch of dried honey. Beneath the crust the surface is red, inflamed, and excoriated, and pours out an abundant semi-purulent viscous ichor,[1] which contributes still more to the thickness of the crust. Unless prolonged by successive eruptions, the crust falls off in from two to four weeks, leaving the surface beneath of a vivid red color, somewhat swollen, exceedingly tender, and covered with a thin and shining epidermis. The surface is occasionally fissured by the movements of the part, and a secretion is poured out, which hardens into a thin secondary crust, and is followed by successive laminæ, formed in the same way. When the whole of the original patch is concealed by the kind of incrustation above described, the character of the disease may still be distinguished by a few scattered pustules, which always appear around the circumference of the crust. As the disease progresses towards cure the semi-purulent ichorous secretion diminishes by degrees, and ultimately ceases; the crusts are no longer augmented in thickness; the secondary crusts, which have become progressively thinner, cease to be formed; and the skin, which is left red and congested, returns, after a certain space of time, to its original color and pliancy.

Constitutional symptoms are either very slight in impetigo, being limited to some degree of lassitude and headache, or they are absent altogether. The local symptoms consist of heat and itching, which are much increased, and accompanied by a feeling of tension and

[1] Mason Good has given the terms "running scall and humid scall" to impetigo; both, however, more properly belong to eczema.

smarting during the pustular stage. After the formation of the crusts these symptoms gradually subside, but the skin remains tender for some time after their fall, and very susceptible of a return of the eruption, if exposed to fresh irritation.

Impetigo figurata presents various modifications in relation to the extent of surface affected, and the course of the disease. Sometimes it is confined to a very limited space, as to the middle of one cheek, the upper lip, the nose, or one or both eyelids, while, at other times, it fixes at once upon the entire face. Sometimes the eruption occupies a patch of small size in the first instance, while the disease spreads by its circumference (*impetiginous ringworm*), so as eventually to cover a large surface, whereof the centre presents the crusted stage of the affection, and the periphery its erythematous and pustular stages. The crusts again occasionally offer a peculiarity of appearance, being conical in their shape, and compared by Alibert to stalactites. This variety he terms *dartre crustacée stalactiforme;* it is most frequently seen upon the eyelids, borders of the eyebrows, nose, &c.; in brief, in any situation where the effused secretion has an inclination favorable to the gravitation of the fluid from the surface of the skin.

Instead of running through its course, and terminating by the restoration of the skin to soundness, within a moderate period, impetigo figurata is sometimes prolonged indefinitely by successive eruptions of pustules, each eruption pursuing the natural course of the typical affection. These successive attacks are occasioned either by a continuance of the original cause of the disorder, or by the employment of stimulating and irritating substances for its cure. In such cases the morbid action extends to the deeper tissues of the skin, producing thickening and condensation of the integument. Again, the eruption may occur periodically, appearing in the spring or autumn season for several successive years.

The most frequent seat of impetigo figurata is the face, and more particularly the cheeks, but it may also occur upon the trunk of the body and extremities. The forearms I have remarked to be a not unusual position of the eruption. It commonly appears on several regions at the same time, and there exists some little difference in regard to the form of the patch, according as it may be developed on the upper or the lower extremities; thus, on the former, it approaches near the circular, on the latter, the oval shape.

Impetigo figurata sometimes assumes a *chronic* form; fresh crops of pustules are no longer produced, but the integument takes on a morbid action, it becomes thickened and infiltrated, and the excoriated surfaces pour out a viscous, semi-purulent secretion, which desiccates into fresh incrustations, the incrustations being reproduced as often as they are rubbed or thrown off. Occasionally the incrustations, instead of being thrown off, form a thick case upon the part affected or around the limb, and constitute that variety which has been denominated, by Willan, *impetigo scabida.* A limb surrounded by a case of incrustation of this kind, has been compared, very aptly, to the trunk of a tree covered with a rough and cracked bark.

IMPETIGO SPARSA.

Syn. *Scattered crusted scall, or tetter.*

Impetigo sparsa (Plate X., c) differs from impetigo figurata only in the more disseminated arrangement of the pustules. Instead of being confined, as in the latter, to a single spot or region, they are, in the *sprinkled* form, distributed over a considerable surface; for instance, over an entire limb, and sometimes over the whole body. The eruptive process pursues precisely the same course with that described as the typical form of the preceding variety; it is attended with considerable pruritus, and the pustules are successive, being freshly developed in the midst of fully formed crusts. Impetigo sparsa usually appears on the limbs, especially on the lower extremities and about the ankles, and is frequently seen in the neighborhood of joints. On the legs it is not unfrequently associated with œdema, and is exceedingly troublesome.

Impetigo sparsa is more apt to degenerate into the chronic form than the preceding variety. The surface beneath the crusts often presents superficial ulcerations, the integument becomes thickened and infiltrated, and the large collections of crusts constituting impetigo scabida, are more frequently produced.

IMPETIGO SCABIDA.

Impetigo scabida (Plate X., F) is merely that state of the two preceding varieties in which the surface is covered by a thick incrustation resembling the rough bark of a tree. This crust is broken and fissured from point to point by the movements of the part, and through the apertures a quantity of semi-purulent secretion oozes to the surface, and desiccates on the exterior of the crust. Sometimes impetigo scabida occurs upon the face, forming a complete mask to the features, but generally it is seen only on the limbs, and accompanies the chronic form of the eruption. It is attended with much pain in moving the limb, and by troublesome pruritus. When the crust is removed, the surface beneath is observed to be excoriated by superficial ulcerations, and fresh incrustations are speedily formed. Impetigo scabida is for the most part met with in old persons, and in those of debilitated constitution, and is not unfrequently associated with œdema.

IMPETIGO ERYTHEMATICA.

Impetigo erysipelatodes. Erythematic scall.

The ordinary forms of impetigo are characterized by the absence of constitutional symptoms, and by the moderate degree of inflammation which accompanies the local disease. Sometimes, however, the eruption is preceded by burning heat of surface, tension, great redness, tumefaction; in short, by the usual signs of acute erythema. To these are added fever, and considerable constitutional disturbance, the eruption appearing as usual, and running the same course. It is upon this combination of symptoms that Willan has bestowed the designa-

tion of impetigo erysipelatodes, which I have ventured to correct by changing the name to impetigo erythematica.

IMPETIGO CAPITIS.

Impetigo capitis may present itself to our observation, either in its aggregated or its scattered form; and it may be developed at once upon the entire head, or make its appearance separately on the scalp, the face, or the ears. The aggregated form of the disease, impetigo figurata, may be looked upon as an advanced stage of eczema impetiginodes, or an eczema rubrum bursting into existence with a crop of pustules instead of vesicles; as, in fact, an eczema occurring in a pyogenic constitution. Hence, when impetigo capitis is severe, the local state and symptoms so closely resemble eczema impetiginodes, as to force upon the mind the impression of their being the same disease; and, as far as their management is concerned, their treatment must be precisely the same.

Impetigo figurata being an eruption of pustules, and the discharges which are poured out in the course of the disease being as abundant as those of eczema, with the addition of their purulent character, the crusts are remarkable for their thickness. They are of a yellowish and brownish-yellow color, and have been compared to dried honey, the disease itself, in consequence of this similitude, being termed *melitagra*. Another point of resemblance between impetigo figurata capitis and eczema impetiginodes is the strong odor of valerianic acid exhaled by the purulent and semi-purulent secretion.

Impetigo figurata is usually met with in young persons and children, particularly infants at the breast, hence the term *impetigo lactantium*. Then, when the thick crust forms upon the head, the term *tinea lactea* is applied to this affection, as well as to its congener, eczema impetiginodes. On the face, for the same reason, it constitutes a *crusta lactea* and *porrigo larvalis;* and it would be difficult for the most experienced dermatologist to determine, in an established case of crusta lactea, whether the disease had commenced as a crop of pustules or of vesicles. Subsequently, the discharges are exactly the same, the differences, if any, being simply a plus or minus in the proportion of pus globules entering into the composition of the morbid secretion. This admixture of the pus of impetigo with the ichorous and viscous secretion of eczema, gives a milky opacity to the fluid, suggestive of a mucous, or rather of a muco-purulent, secretion; hence the term employed by Alibert to designate this character, namely, *tinea mucosa*. In like manner, *tinea granulata*, another term originating with Alibert, has been applied to impetigo, as well as to eczema; deriving its origin from the broken crusts which are scattered among the hair in impetigo capitis, and more particularly in impetigo sparsa capitis.

When impetigo figurata capitis attacks the hairy scalp, it gives rise, by its secretions and crusts, and by the disorder and matting of the hair which ensue, to all the distress and suffering which have been described in association with eczema impetiginodes of the same region; so, in impetigo faciei, the symptoms are the same as in crusta

lactea from eczema. In a case of this disease, delineated in my *Portraits of Diseases of the Skin*,[1] the crust upon the face was so thick as to retain the features in a fixed position, and the surface so tender, that the slightest touch produced pain. The disease, having extended to the ears and back of the neck, prevented the patient from lying down in bed; and an accidental pressure of any kind, even the motion necessary to open the mouth, occasioned a cracking of the skin, and an oozing of blood from the cracks; to which was added a constant pricking and itching pain, and a feeling of excessive heat.

Impetigo sparsa is not unfrequently met with on the scalp (Plate X., D E), where it occurs as single pustules or in small groups. These individually run through the course already described as appertaining to impetigo figurata, forming crusts of various size and various degrees of thickness. They are attended with heat, itching, and sometimes pain; are often very tender, and when the crusts are removed, are found to be excoriated and moist, from the oozing of a semi-purulent secretion. At the decline of the disease the crusts are broken up, and the fragments, mingled among the hair, or strung like beads on separate hairs, present the characters which have been distinguished as tinea granulata.

Impetigo rarely does any injury to the roots of the hair, and it is only in very severe or neglected cases that partial alopecia can occur.

DIAGNOSIS.—The pathognomonic characters of impetigo are, the small size and little elevation of its psydracious pustules; the subsequent abundant viscous and yellowish secretion which the exposed surfaces pour out; and the thick, yellowish-green, or brownish and grayish semi-transparent crusts.

When impetigo affects the chin only, it may be mistaken for sycosis, unless we recollect that in the latter eruption the pustules are larger, more prominent, discrete, less yellow in color, and succeeded by less secretion. Moreover the crusts of sycosis are darker in color, less moistened by secretion, not renewed when they fall off, and accompanied by tubercles and indurations.

CAUSES.—Impetigo occurs in both sexes, at every age, and in all seasons; it is, however, more common in children than in the adult, and in women and persons having a thin and delicate skin, than in the male sex, and those whose skin is less susceptible.

The disease is referable to constitutional causes, and is commonly found associated with the general disturbance produced by dentition, amenorrhœa, or the cessation of the menstrual period. Its appearance seems influenced, also, by mental excitement, excess in diet, or stimulating drinks, violent exercise, &c. It is commonly met with in workhouses, where a number of children of unhealthy constitution, poorly fed, and insufficiently clothed, are assembled together; and particularly where care is not bestowed upon the three great hygienic principles, ventilation, cleanliness, and exercise.

Local irritation of the skin is an occasional exciting cause, as in

[1] Plate VIII., AR.

that produced by lichen, the application of stimulating substances to the cutaneous surface, and the heat of the sun.

The impetigo capitis et faciei of infants, the crusta lactea, is referable to the same causes as eczema infantile, with which it is closely allied.

PROGNOSIS.—Impetigo is a troublesome and offensive disease, but by no means dangerous to life. It is frequently tedious, especially when injudiciously treated, and, by the improper use of remedial means, may be prolonged indefinitely, or be made to assume the chronic form, which latter is always obstinate.

TREATMENT.—In impetigo, during its inflammatory stage, emollient and sedative fomentations and water-dressing are the best local applications. When the inflammation is somewhat abated, the eruption should be coated with the benzoated ointment of oxide of zinc rubbed down with spirits of wine (℥j ad ℥j). The ointment is best applied with the finger, and in infants, with a small brush; and care should be taken to fill all the hollows of the surface, and the crevices of the crusts, where they have been allowed to form. This ointment should be applied thickly, and repeated morning and night, and as frequently during the day as the surface may be disturbed, or the previous layer of ointment rubbed off. If discharges are formed, they may be wiped off with a soft napkin, and in the same way loosened crusts may be removed. No attempt should be made to wash the eruption, as washing is always followed by desiccation of the surface and an immediate increase of local inflammation and suffering. On the same principle lotions of all kinds are mischievous, unless applied over a coating of the oxide of zinc ointment. This latter step may be taken at any time, as the ointment in no way interferes with the evaporating action of cooling lotions applied to the skin, or the soothing and softening effect of water-dressing and fomentations. In general this is all the local treatment required, but where the surface is too sensitive to bear the zinc ointment, and remains so after the use of water-dressing and emollient or sedative fomentations, it may be pencilled with a weak solution of nitrate of silver in distilled water (gr. ij—vj ad ℥j). Another useful local remedy of the soothing class, is a liniment of olive oil and lime-water, either alone, or with the addition of liquor plumbi diacetatis, or the sedative solution of opium, covering the surface after its application with a sheet of cotton-wool.

In the chronic state of the local disease the nitrate of mercury ointment, more or less diluted, is a valuable remedy; or the nitric oxide of mercury ointment, or the ammonio-chloride. Another useful ointment for allaying pruritus as well as restoring the skin to its normal state by gentle stimulation, is the juniper tar ointment, diluted or strong. With these ointments may be conjoined a moderate amount of friction. In extremely obstinate chronic impetigo, the sulphur ointment may be found serviceable.

The *constitutional* treatment of impetigo requires in the first instance attention to the functions of digestion, the removal of all irritant matter from the alimentary canal, the suppression of fever or feverish symptoms, if they exist, by antiphlogistic means; and subsequently

the restoration of the general tone of the system. With this view, gently purgative medicines, with salines, or alkalies with bitter infusions or tinctures, should be exhibited, and these should be followed by the class of tonics, gentian, quinine, bark, calumba, chirayta, chamomile, quassia, or taraxacum, according to the custom or views of the practitioner. With the tonics, alkalies may be continued, if the lithic diathesis still remain, or if there be evidence of the rheumatic or gouty diathesis. But if the powers of the system be lowered, then the mineral acids may be combined with the bitter remedies, either the hydrochloric, the nitric, the nitromuriatic, or the sulphuric. Again, if anæmia be present, the citrate of quinine and iron, simple tincture of the hydrochlorate of iron, or the acetate of iron with nitromuriatic acid, may be administered, according to the judgment of the practitioner.

In the chronic stage of impetigo, the alterative tonic properties of arsenic may be required, and then, as in psoriasis following erythema, lichen, or eczema, any of the arsenical preparations commonly in use may be adopted; Fowler's or De Valangin's solution; the arseniate of soda, ammonia, or quinine; the iodide of arsenic, or in very stubborn cases, where the alterative action of mercury and iodine may seem to be desirable, in addition to that of arsenic, the liquor hydriodatis hydrargyri et arsenici or Donovan's solution.

In crusta lactea my treatment is as follows: a calomel purge of one or two grains, according to the age of the child, and repeated once or twice in the week, or as often as the child may evince feverishness, great irritation, restlessness, heaviness, or peevishness; from two to three minims of Fowler's solution given with meals twice or three times a day; and the constant and efficient application of the benzoated ointment of oxide of zinc with spirits of wine. These means properly used, I have never known to fail, and I believe never can fail. As there is always some anæmia in children affected with this disease, I usually combine the Fowler's solution with a few drops of vinum ferri; sometimes I prefer the solution of De Valangin, in which case the tincture of the hydrochlorate of iron is the best associate for the arsenic; and sometimes I give the preference to the arseniate of soda, on account of its great convenience as a medicine for infants. It is, moreover, necessary, in this disease of mal-assimilation and mal-nutrition, to secure to the child a wholesome diet, and to add to its ordinary food beef-tea or mutton-tea. It is, perhaps, hardly necessary to remark, that the arsenic, which usually agrees remarkably well with infants, and with them is an invaluable remedy, should be watched, lest it disagree; and immediately it does so, omitted, and a calomel powder given.

In *impetigo of the scalp*, it may be necessary to shorten and thin the hair; but where attention has been bestowed to cleanliness, and the head kept well brushed and anointed, I have rarely found it necessary to shave or even crop the hair.

ECTHYMA.

Syn. *Ecpyesis ecthyma*, Mason Good. *Phlyzacia. Papulous scall.*

Ecthyma[1] (Plate X., H—Q) is an acute inflammation of the skin, characterized by the eruption of prominent pustules, of a rounded form and considerable size, upon any part of the surface of the body. The pustules are discrete and scattered, they are developed on a hard and inflamed base, and terminate in dark-colored crusts, which leave a deeply congested surface, and often a brown stain, at their fall, and sometimes a superficial ulcer, followed by a cicatrix. The eruption is, for the most part, partial and successive; in rare instances it is general; in the former case it may endure for one or two weeks, in the latter for several months. It is not contagious.

Ecthyma is endowed by Willan with four varieties, having relation to the constitution and age of the patient; these are, ecthyma vulgare, ecthyma infantile, ecthyma luridum, and ecthyma cachecticum. I prefer, however, with Rayer, to consider the disease as presenting an acute and a chronic type; the former of these divisions corresponding with the ecthyma vulgare, and the latter embracing the three remaining varieties. In a tabular form, the varieties of ecthyma are,

Ecthyma acutum, seu vulgare,
Ecthyma chronicum, { E. infantile, E. luridum, E. cachecticum.

ECTHYMA ACUTUM, SEU VULGARE.

This eruption (Plate X., H—N) is most frequently seen upon the extremities, often on the shoulders and neck, but rarely on the scalp. Its development is indicated by the appearance of small, red, and circumscribed spots, which gradually rise above the surface, are hard and painful to the touch, and increase to a variable size. Upon the summit of each of these conical elevations a small quantity of puriform fluid is effused beneath the epidermis, and the matter continues to be augmented by additional secretion, until a pustule is formed. The size of the pustule is various; usually it is as large as the half of a pea, and surrounded by a hardened base of vivid redness, while at other times it covers the whole extent of the hardened base, and resembles a bulla distended with pus. The development and growth of the pustule are accompanied by severe and often lancinating pain. In the course of three or four days after the completion of the pustule, the contained fluid dries up into a dark-colored scab of various thickness, which falls off in eight or ten days, leaving behind a congested circular spot of a deep red color. Sometimes the purulent fluid is removed by absorption, and the surface of the skin is restored to its natural state, after repeated desquamation. At other times a super-

[1] Der. ἐκθύειν, to burst forth. "Apertum est ab ἐκθύειν, quod est ἐξορμᾶν, id est, *erumpere*, derivatum esse; ἐκθύμασι, id est, *papulis*, nomen in iis quæ sponte extuberant in cute."—*Hippocrates*, lib. iii. sec. 51.

ficial ulcer is formed, particuarly on the lower extremities, and terminates with a slight cicatrix. When the eruption of pustules has been numerous, the congested spots left by the fall of the crusts present a remarkable appearance.

Rayer gives so excellent an account of the structure of the pustules, during their progressive development, that I am tempted to quote his words. "We find," writes this author,[1] "1. That in their first stage (red elevations) there is merely sanguineous injection, with conical tumefaction of the corion; 2. That in the apex, more rarely over the whole surface of the elevations, and under the cuticle, there is an effusion of a certain quantity of purulent serum; 3. That in the third stage, which follows immediately after, there is a kind of pseudo-membranous matter deposited in the centre of the elevation, which is now evidently perforated; 4. That after the voidance of this matter, and the removal of the cuticle, the pustule appears under the form of a cup-shaped cavity, surrounded by a hard, thick, puffed edge; 5. Lastly, that on the following days, this thickened margin subsides, at the same time that a slight cicatrix is formed under the crust, the centre of which is fixed within the point where the perforation had been observed."

ECTHYMA CHRONICUM.

Chronic ecthyma (Plate X., H—Q) is a more common form of disease than the acute variety; it occurs in successive eruptions, generally in persons of debilitated and cachectic habit, and is prolonged for several months.

When it appears in ill-fed, ill-clad, and weakly children, or in those who are debilitated from preceding disease, it constitutes that variety which has been designated by Willan, *ecthyma infantile*. This eruption is not unfrequently associated with irritation or disease of the alimentary mucous membrane. The pustules are very dissimilar in point of size, some being small, and some large; they are circular in form, surrounded by an areola more or less inflamed, and terminate by absorption of the purulent fluid and epidermal desquamation, or by ulceration. The ulcers in this disease are unhealthy, and difficult of cure.

In old persons, and in those whose constitution is injured by excess, the congested areolæ often present a purplish-red and livid color; the pustules are of large size, and filled with a sanguinolent, puriform fluid, and they are remarkable for the tardiness of their course. This character of the eruption constitutes the *ecthyma luridum* (P. Q.) of Willan and Bateman.

In persons of unsound and cachectic constitution, of all ages, the cachectic form of eruption is developed. The pustules occur upon all parts of the body, but most frequently on the legs. The inflammation preceding the eruption is more extensive than in ecthyma acutum, and variable in degree. At the end of six or eight days, the epidermis is raised by the effusion of a small quantity of dark sanguinolent pus,

[1] Translation by Willis, second edition, p. 530.

which forms, by its increase, an unhealthy and discolored pustule. When the pustule is fully developed, the epidermis bursts, and the denuded surface becomes covered by a thick, dark-colored crust, which remains adherent for several weeks. If the crust be removed by accident or design, an ill-favored ulcer, with inflamed edges, is exposed, which is tedious and difficult of cure.

The pustules of ecthyma are not unfrequently associated with scabies, lichen, prurigo, and some other chronic affections of the skin.

Diagnosis.—The large size and prominence of the pustules, their inflamed bases, and the mode of their development, serve to distinguish ecthyma from all other pustular affections. When the pustules of acne and sycosis attain a large size, they bear some resemblance to ecthyma, but are easily distinguished by the broad and inflamed areola of the latter, and the hard, tubercle-like elevations without areolæ of both the former.

Syphilitic ecthyma is distinguished, from the form at present under consideration, by the more chronic character of the eruption, the limited extent of the areola, its coppery hue, the blackness and concentric marking of the crust, and chiefly by the presence of other signs of constitutional syphilis.

Causes.—Ecthyma may be developed at all periods of life, and at all seasons, but is principally observed in young persons and in the adult, and most frequently in the spring and autumn. It is essentially a disease of debility and cachexia.

It may be excited by various stimuli applied to the surface of the skin, such as sugar, lime, salt, sulphur, &c. Grocers are liable to this eruption, from the irritation produced by the first of these substances, and bricklayers of the second. The manipulation of pulverulent substances of all kinds is apt to act as an exciting cause, and simple friction may give rise to the same consequences. The pustules following the irritation of tartarized antimony are ecthymatous; they are umbilicated, contain in their interior a false membrane, are very numerous, and are succeeded by dark-colored crusts.

Ecthyma is often symptomatic of a disordered state of the system, as of some chronic affections of the viscera, or irritation of the gastro-intestinal or uterine mucous membrane. It may also be induced by excess of mental or physical exertion, by bad and deficient food, want of proper clothing, residence in damp and unhealthy localities, want of cleanliness, debilitating causes of various kinds, excesses, and exposure to vicissitudes.

Prognosis.—The prognosis of ecthyma depends on the state of constitution of the patient rather than upon the eruption, which is in most cases an effect of disordered health. When the cause is external, and the form of the disease acute, the eruption seldom continues longer than two or three weeks; but the chronic affection may be prolonged for several months.

Treatment.—In the acute variety of ecthyma, after the removal of the cause, some gentle laxative and alterative medicine, with diluents and abstemious regimen, is all that will be required. The best local application is the superacetate of lead, or oxide of zinc ointment, or if

the inflammation be severe, sedative and emollient fomentations, and water-dressing.

The chronic forms of the disease call for the use of tonics and alteratives, of which the best is the nitro-muriatic acid with gentian. Sometimes quinine with sulphuric acid appears to be indicated, or the citrate of iron and quinine; the choice of the form of tonic being a matter for the judgment of the medical man. Where there is emaciation, particularly in young persons and children, the cod-liver oil is an excellent and useful remedy. Arsenic is never called for in ecthyma as a specific medicine, but as a general tonic, if thought desirable, there can be no objection to its use.

CHAPTER IX.

DISEASES ARISING FROM GENERAL CAUSES.

HERPETIC AND BULLOUS ERUPTIONS.

In the four chapters which precede, erythema, lichen, eczema, and impetigo follow each other in succession, and are closely allied, not only in their general but also in their particular cause. I have endeavored to show that they may be regarded as one disease, modified by secondary conditions appertaining to the constitution of the individual, and that they less frequently occur in a distinct form than in combination the one with the other. That erythema is the first and the last stage of all; that lichen is an erythema affecting more particularly the follicular structure of the skin; that eczema differs from erythema and lichen only in its pathological effects, being, in fact, an erythema or lichen, or both together, with the superaddition of an effusion of a colorless ichor or lymph; and that impetigo is the simple substitution of pus for lymph, the natural consequence of a pyogenic diathesis. I now, however, come to two diseases, herpes and pemphigus, grouped together by an artificial character (namely, a large vesicle or bulla), which have nothing in common with the four preceding forms of cutaneous disease, excepting their origin in a general cause, or one generated in the constitution of the individual; and nothing in common with each other, excepting that same general cause, and the special pathological phenomenon of the development of a vesicle of a more considerable size and more distinct outline than the vesicle of eczema, a vesicle which ranges in magnitude from the size of a millet-seed to that of a large orange, and has received in consequence the technical name of *bulla*.

Viewing herpes and pemphigus side by side, there will be found more difference between them than in the corresponding groups assembled under the heads of erythema, lichen, eczema, or impetigo. These groups include diseases which have a certain and mutual

affinity with each other, but that cannot be said to be the case between herpes and pemphigus; they differ in their proximate cause, and in every feature of their development and progress, excepting the one accidental similitude of both being attended with an effusion of lymph, to an amount sufficient to lift up the epidermis into a vesicle or bleb of considerable size. But, even in this particular, there is a marked distinction between them; the vesicle of herpes never exceeds a certain moderate bulk, namely, that of the hemisphere of a small pea; but the vesicle or bulla of pemphigus has no definite size, being of all dimensions on the same as well as on separate individuals. Then the character of the inflammation which accompanies them is wholly different: one is specific and severe, the other general and slight; one is remarkable for the pain with which it is accompanied, the other is painless; one runs quickly into suppuration as a part of its nature, and is apt to give rise to ulceration of the skin; the other rarely produces pus, and is quite superficial. With a perception of these contrasts before me, it is not without compunction that I group together herpes and pemphigus, and I do so simply with the view of limiting the number of divisions which would otherwise exist, and by so much complicate a department of medicine which it is my wish to render plain. Nevertheless, in my own mind, an herpetic eruption and a bullous eruption suggest very different ideas.

Heretofore, founding my notions of classification upon the nature of the product of the morbid skin, I had, with other authors, grouped herpes with eczema, but I can no longer retain it in that position. Herpes is a disease apart from all others, and must stand alone; all that I can do for it is, to place it, as I have, by the side of an affection, distinguished like itself in some degree, by the large size of its vesicles. Rupia I have transferred to a more proper location, namely, among syphilitic eruptions.

HERPES.

Syn. *Tetter*. *Olophlyctis*, Alibert. *Dartre*, Fran.

Herpes[1] (Plate IX.) is a non-contagious affection of the skin, characterized by the eruption of clusters of globular vesicles upon inflamed patches of an irregular or rounded form, and of small extent. The eruption rarely presents any remarkable degree of severity; it is not usually accompanied with symptoms of constitutional disturbance; and it lasts for a brief period only; rarely longer than two or three weeks. Each vesicle runs a course of about ten days, and terminates either by absorption of its contents, by desiccation without rupture, or by rupture and the formation of a thin brownish scab, which speedily falls.

The varieties of herpes derive their designation either from the form and arrangement of the clusters, or from the locality of the affection. In reference to their general characters, these varieties admit of a

[1] Der. ἕρπειν, to creep.

natural division into two groups, a phlyctenoid group, and a circinate group. The *phlyctenoid group* is characterized by the irregularity of form and distribution of the clusters; it is typified by the variety herpes phlyctenodes, and embraces all the local forms. The *circinate group*, on the other hand, is remarkable for the circular arrangement or form of its clusters; hence, the herpes zoster consists of irregular clusters disposed in a circular form around the trunk of the body; herpes circinatus is characterized by the disposition of individual vesicles in the form of a circle; and herpes iris presents the same peculiarity in the form of concentric circles. In a tabular plan, the varieties may be thus arranged:

1. *Phlyctenoid group.*
   - Herpes phlyctenodes,
   - " labialis,
   - " nasalis,
   - " palpebralis,
   - " auricularis,
   - " præputialis,
   - " pudendalis.

2. *Circinate group.*
   - Herpes zoster,
   - " circinatus,
   - " iris.

HERPES PHLYCTENODES.

Syn. *Herpes miliaris. Nirles. Olophlyctis miliaris*, Alibert.

The phlyctenoid variety of herpes (Plate IX., B) presents no regularity of form or of appearance; it may show itself upon any part of the cutaneous surface, or upon several regions at the same time, but is most commonly developed on the upper parts of the body, as the face, neck, and arms, and less frequently on the lower extremities.[1] The vesicles are globular; they vary in size from a mere point to the bulk of a pea, and are produced in a cluster upon an irregular or rounded patch, rarely larger than the palm of the hand. Frequently there are two or more of these patches. The eruption usually disappears at the end of a week: sometimes, however, it is prolonged by successive eruptions to two, and even to three weeks; the yellowish spot which it leaves behind continuing perceptible for as many months.

The eruption is preceded by a sense of heat, tingling, and smarting, and upon the portion of skin so affected, numerous minute red points are shortly perceptible. On the following day the redness of the patch becomes general, and a great number of small globular vesicles, of various sizes, and distended with a limpid transparent lymph, are developed. During the third day the contents of the vesicles become turbid and lactescent, with here and there one which is sanguinolent; and on the fourth day some few have a semi-purulent appearance. On the third and fourth days, the vesicles begin to shrink, and on the succeeding days to form, with their contained secretion, thin, brownish scabs; these are thrown off by desquamation on the tenth or twelfth day, leaving a redness and livor of surface, which dis-

[1] In one instance the eruption occurred on the temple; and one vesicle was developed on the conjunctiva, and gave rise to much redness and inflammation.

appears only by degrees. The purulent vesicles are not unfrequently followed by small superficial ulcerations.

The local symptoms accompanying the eruption are, itching, pricking, smarting, and an intense burning heat, with frequently a deep-seated pain, all of which symptoms continue for a short time in a mitigated degree after the subsidence of the eruption. Constitutional symptoms are rarely present, and, should they exist, are limited to some degree of languor, thirst, loss of appetite, and diminished secretions.

The following is an illustration of the common cause and progress of herpes. A boy, fifteen years of age, sat for some time on the grass, on Good Friday, April 10th, 1846. The next day he had severe pain over the whole of the front part of the right thigh, which was attributed to rheumatism. On the evening of Saturday a blush of redness, in patches, was apparent on the surface. On Sunday, minute vesicles in clusters were perceived here and there upon the red patches. These vesicles soon became distended with a transparent and colorless fluid, and reached their full size, looking, towards evening, like so many pearls. On Monday some of the vesicles were already becoming shrivelled, and had a purplish hue, while others, fully distended, possessed a rich grape-yellow tint. On Tuesday all the vesicles were on the decline, with the exception of a few tardy clusters, which were now attaining maturity. On Wednesday, the fourth day of the eruption, the greater part of the vesicles had dried up into reddish-yellow wrinkled scabs. On succeeding days the scabs became gradually darker and harder, and were closely imbedded in the skin. By Saturday a few only of these scabs remained; and on Sunday, the completion of the week, traces only of the existence of the eruption remained.

HERPES LABIALIS.

Syn. *Exanthema labiale.* *Hydroa febrile*, J. Franck. *Olophlyctis labialis*, Alibert.

Herpes labialis resembles herpes phlyctenodes in every respect, with the exception of situation and extent. This eruption is preceded by itching, redness, swelling, heat, and painful tension of the lip, sometimes affecting the mucous membrane of the prolabium only, at other times the integument alone, and again, both the one and the other conjointly. The redness extends to a variable distance around the mouth, sometimes reaching to the nose, and less frequently to the cheeks and chin. On the second day from the appearance of the redness, and sometimes earlier, several crops of small round vesicles, five or six in number, are developed on the inflamed surface. Some of the vesicles, by their confluence, unite to form small cellular bullæ, of the size of a split pea. On the third and fourth days, the lymph of the vesicles becomes turbid and lactescent, and subsequently semi-purulent. On the fifth or sixth day a brownish crust is formed by the desiccation of the vesicles and their contents; and on the eighth or tenth the crust falls. The formation of a crust may frequently be prevented, by carefully opening the vesicles as soon as formed, and by

the application of a weak solution of sulphate of zinc in rose-water. When the crust is interfered with during its formation and removed, a hardened scab is produced, which remains adherent for a much longer period than the natural crust. Herpes labialis is sometimes associated with aphthæ of the mouth.

HERPES PALPEBRALIS, NASALIS, ET AURICULARIS.

An eruption of globular vesicles identical with those of herpes labialis is sometimes developed on the upper eyelid, along the borders of the alæ of the nose, or in the concha of the ear, in association with irritation or inflammation of the mucous membrane of the eye, nares, and external ear. The progress of the eruption is similar to that of the preceding affection.

HERPES PRÆPUTIALIS.

Like herpes labialis, the present variety may affect either the mucous or cutaneous surface alone, or both conjointly. The disease in this situation appears under the form of one or more red and well-defined patches of about the size of a sixpence, upon which the globular vesicles of herpes are developed. On the cutaneous surface the vesicles pass mildly through their course, the fluid is frequently absorbed, either in its serous or semi-purulent state, or they form thin, brownish scabs, which desquamate at the end of a week or ten days.

On the mucous membrane the inflammation accompanying the eruption is somewhat more severe. The vesicles assume a larger size, become speedily lactescent and semi-purulent, and terminate in thin brownish scabs. These are not unfrequently rubbed off previously to their natural desquamation, and leave behind them small excoriated surfaces, which might, by inattention, be mistaken for chancre.

The symptoms accompanying both these forms of eruption, are, heat, itching, and often a pricking sensation. The disease is dependent for its cause on friction with the dress in persons of great susceptibility of skin; contact with discharges from the vagina; neglect of habits of cleanliness; and irritation of the genito-urinary mucous membrane. Herpes præputialis sometimes becomes chronic, and is then difficult of cure.

In its excoriated state, as I have before remarked, this eruption offers some risk of being mistaken for chancre. But the superficial ulceration of herpes, the occurrence usually of several small ulcerations in a cluster, and the uniform level of the exposed surface, are characters which contrast very strongly with the chronic progress of chancre, its thickened and raised edges, and the whitish appearance of its surface produced by a false membrane.

HERPES PUDENDALIS.

This affection presents all the characters of the preceding varieties; the vesicles appearing on the integument and mucous membrane of the labia majora, or upon the internal surface of the vulva. In these

situations, the eruption is often rendered obstinate by the continuance of irritation kept up by morbid secretions from the vagina.

HERPES ZOSTER.

Syn. *Zona. Zoster. Cingulum. Ignis sacer. Zona ignea. Shingles. Der Gürtelausschlag, Feuergürtel*, Germ.

Herpes zoster, or shingles[1] (Plate IX., A—F), is especially characterized by the arrangement of the inflamed patches with their clustered vesicles, in the form of a half zone,[2] which extends around some part of the trunk of the body, from the middle line in front to the middle line behind. The eruption usually occurs at about the middle of the trunk. When it is developed higher up, the patches take their course across the shoulder, and are frequently prolonged along the arm; and when it is situated in the lumbar region, they occasionally extend to the thigh and leg, *herpes proserpens*. In rare instances, the eruption is met with forming a half collar to the neck, or a demi-zone around the face or head; it has also been observed upon one side of the scrotum or penis. Herpes zoster occurs indiscriminately on either side of the body; by some authors, it is stated that the eruption appears for the most part upon the right side, while others contend that the left is most frequently affected; my own experience corresponds with the latter statement. It is an acute disease, lasting from one to three or four weeks.

Herpes zoster, in the manner and course of its eruption, is identical with the typical form, herpes phlyctenodes, but more severe in its symptoms. The patches by which it appears are of a vivid red color, commencing usually at both extremities of the demi-zone, and proceeding outwards by successive eruptions, until they constitute, by their approximation, an irregular line. The first formed patches are larger than those which succeed. They are perfectly distinct from each other, being separated, to a greater or less extent, by interstices of sound integument. Shortly after the appearance of each patch, a number of small white and glistening prominences are seen upon it, which speedily assume the form of vesicles, and the latter go on increasing in size, until, at the end of three or four days, they attain the magnitude of small peas. The vesicles are developed in groups, consisting of considerable numbers on each patch; and in some situations they become confluent, and resemble small bullæ. At their first eruption they are filled with transparent lymph, which becomes turbid on the second and third day, and subsequently semi-purulent, or purulent in some, and of a purplish or blackish tint in others. On the fourth or fifth day, the vesicles begin to collapse and fade; they look wrinkled, and, during the two following days, dry

[1] See "Portraits of Diseases of the Skin," Plate V., AY. In this figure, besides the zona around the trunk of the body, a large patch of herpes phlyctenodes is seen on the flank, just above the hip.

[2] An unfounded notion was prevalent among the older physicians, that if the zone encircled the entire body, the case would terminate fatally. Pliny, amongst others, refers to this presumption.

up, with their contents, into small scabs of a dark brown color, which fall on the tenth or twelfth day, leaving behind them a redness of the skin, which slowly disappears. The vesicles are not unfrequently intermingled with true pustules.

This disease is greatly modified, as regards its termination, by the state of health and vigor of the patient. In young and healthy persons the contents of many of the vesicles are absorbed on the fifth or sixth day, and the affection terminates by desquamation. In weakly and old persons, on the contrary, the sero-pustules burst, and produce painful excoriations, or ulcerations, which are often long in healing. These unpleasant consequences are most frequent on the dorsal region of the trunk, from the friction and pressure to which the vesicles are subject in this situation during decubitus. Sometimes, also, in old persons, the disease terminates in gangrene of the integument.

The symptoms accompanying herpes zoster are, a pungent and burning heat (*ignis sacer*, *zona ignea*) at the commencement of the vesicular eruption, and a continuance of the burning pain, to a greater or less extent, throughout the course of the disease. Its invasion is not unfrequently indicated by acute pains, which seem to shoot through the chest and epigastrium, and by palpitations and tumultuous action of the heart. The close of the affection is sometimes marked by severe, and often intense neuralgic pains, which continue for several weeks, or even months. The constitutional symptoms are for the most part slight, consisting of feverishness, quickened pulse, and gastro-intestinal irritation. In some cases, the latter symptom is remarkable for its severity; and, in rare instances, the eruption is preceded by a rigor.

The urinary secretion in herpes zoster has been made the subject of chemical examination by Heller.[1] In one case, that of a boy eight years of age, the urine was abundant, faintly alkaline, pale yellow, rather turbid, rapidly became putrid, and deposited crystals of ammoniaco-magnesian phosphate. Its specific gravity was 1014–1015. In a young man, aged nineteen, the urine was clear, became turbid in the course of twelve hours, and deposited crystals of ammoniaco-magnesian phosphate; specific gravity 1018. In a man, thirty-one years of age, in whom there was slight fever, the urinary secretion was suppressed, that which was examined being the first that had passed for twenty-four hours. It was strongly alkaline, and deposited a sediment of ammoniaco-magnesian phosphate and urate of ammonia. Its specific gravity was 1028.

The deductions resulting from the analysis of these three cases are, that there is—"1. A marked increase of the chlorides and phosphates, and a corresponding diminution of the sulphates; 2. An excess of hydrochlorate of ammonia; 3. A large amount of fat; 4. A diminution in the amount of uric acid;" an increase only occurring when the disease is accompanied with fever. The presence of oxalate of lime may always be suspected in these cases.

[1] Dr. Day, in Simon's Animal Chemistry.

HERPES CIRCINATUS.

Syn. *Zona herpetica. Vesicular ringworm.*

Herpes circinatus (Plate IX., G) is an eruption of vesicles of small size and globular shape, upon patches of inflamed skin, which assume the form of a circular ring. The circles are of various size and breadth, rarely exceeding in diameter the palm of the hand, and inclose an area of unaffected skin. They are of a vivid red color, and the vesicles numerous and sometimes confluent. The patches run through their course in eight or ten days, but when the disease assumes a chronic character, and the circles are successive in their eruption, it may be prolonged for several weeks. This eruption appears upon all parts of the body, but is most frequently developed on the face, neck, breast, and upper extremities.

Herpes circinatus commences in the form of small circular or oval patches of vivid redness, which become pale in the centre, while they increase in size by the circumference. The vesicles are developed nearer the outer margin of the patch; they are small and globular, and run through the usual course of herpetic vesicles, becoming, at first, turbid and milky, and then desiccating into small thin scabs, which fall off in eight or ten days, the denuded surface of the skin retaining a red color, which gradually subsides. The symptoms accompanying the eruption are, a slight pricking and smarting sensation, with some degree of itching.

When the attack is slight, the vesicles are small, and their contents are disposed of by absorption, the eruption terminating by desquamation. In other cases, the central area is not wholly free from the influence of the inflammatory action, but desquamates with the circumferential ring.

HERPES IRIS.

Syn. *Rainbow ringworm. Erythema iris. Pemphigus iris.*

Herpes iris[1] is a very remarkable and comparatively rare variety of cutaneous affection. It is characterized by the eruption of a vesicle on a small circular erythematous blotch; the blotch increases in size by its periphery, throwing out an erythematous ring upon which the cuticle is raised into an annular vesicle more or less complete. Sometimes the process ceases at this stage, at other times new rings are produced, either with or without fresh elevations of the cuticle, and the blotches attain a considerable size. The rings being successive, exhibit various tints of color, hence the term *iris*, and the elevations of the cuticle being also successive, either remain as puckered rings more or less complete, sometimes as separate vesicles, or they are taken into the original vesicle and constitute a bulla of considerable size (*pemphigus iris*). On the decline of the eruption the contents of the vesicles are absorbed, or dry up, and together with the cuticle

[1] Portraits of Diseases of the Skin, Plate VI., AZ, exhibits a well-marked case of this curious form of eruption.

form a thin laminated scab, which after a time is thrown off: the erythematous rings also desquamate, and the site of the blotch remains for some days, marked by circular traces of concentric rings, which fade by degrees.

As I have remarked, the eruption may stop at any stage of its progress, and on different parts of the body, or in different degrees of severity of the disease, the patches are more or less considerable, and their characters more or less complete. Thus, if it stop at the erythematous stage, without throwing up a vesicle, but produce a series of rings, the case is one of *erythema iris;* if it develop a vesicle of moderate size, either surrounded by erythematous rings, or by vesicular as well as erythematous rings, the case is *herpes iris;* and if, by a more active effusion, the vesicle should creep on with the erythematous rings, taking them into its area as it proceeds, a bulla of greater or less magnitude is formed, and the case is *pemphigus iris.* When the eruption is general, the whole of these forms may frequently be seen at the same moment, and the gradations of development are made evident.[1]

In elderly persons this eruption is occasionally met with occurring on the hands and feet, and remaining at the erythematous stage; in adults, the herpetic form prevails; in children, and also in adults where the system is relaxed and the constitution cachectic, the bullous or pemphigoid form is most frequently met with. In the erythematous form, as it is commonly seen on the hands, the eruption presents three shades of color, which are more or less distinct; the centre is red, then follows a ring of a whitish or yellowish tint, and externally to this is a narrow areola of light crimson. On other parts of the body, the number of tints of color and the number of rings may be increased to five or six, or even double that number. I have observed that a new ring is generally produced in the course of twenty-four hours; so that by counting the rings it would be possible to determine the number of days it had taken to arrive at its existing state. In one patch I counted seven white rings, representing seven days, and seven circles of fading red between them, the outermost white ring being bounded by a narrow areola of pale crimson; and in another patch, only half an inch in diameter, I counted nine different tints of color, which from the centre to the circumference were as follows: red, brown, white, deep red, lighter red, deep red, pale red, deep red, yellowish white, and crimson blush.

Herpes iris is essentially chronic, and a disease of cachexia, and in both these particulars it is allied rather with pemphigus than with herpes. Herpes runs a definite course, and although its patches may appear in succession, each individual patch has its specific and uniform career. Not so with regard to herpes iris; in the erythematous form it is always slow, remaining without change for several days, while in the bullous form, it has all the rapidity of pemphigus; and in neither

[1] Dr. Marshall Hall has given an excellent description of this disease in the "Edinburgh Medical and Surgical Journal." He remarks that some of the patches attain the diameter of an inch, and that the central vesicule sometimes becomes developed to the size of a bulla, and obscures the concentric rings.

has it the exact periods of herpes. The same remarks apply to the constitutional symptoms: in the erythematous form, the symptoms are referable to chronic mal-assimilation; while in the bullous form, the leading character of the disorder is cachexia. In one patient, a little boy, there was a perpetual state of feverishness, with emaciation, and a dry and parched state of the skin; while in another, an adult, the mucous membrane, was severely affected; there were aphthæ in the mouth, fauces, and nares, the bowels were sometimes teased with diarrhœa, sometimes with dysentery, and the discharges from the bowels contained a quantity of mucus tinged with blood. The whole condition of this patient was one of cachexia, and when the eruption broke out, the constitutional symptoms were relieved.

Diagnosis.—The globular form of the vesicles, their size, their number, their pearl-like lustre, their clustered arrangement, and the redness and isolation of the patches, are the chief pathognomonic characters of herpes, and serve to distinguish it from every other affection. The vesicles are too small to be mistaken for the bullæ of pemphigus, and they are larger, more prominent, and better defined than the vesicles of eczema.

Herpes phlyctenodes and *zoster* are distinguished only by the arrangement of the inflamed patches. In the former they are distributed upon various parts of the body at the same time, while in the latter they are limited to a region. The vesicles of herpes zoster are larger than those of the other varieties, and are also more violent in their effects.

Herpes circinatus, from the peculiarity of its form, is liable to be confounded with erythema circinatum, or with lepra in its decline. From the first it is not easily distinguished, unless one or more of its vesicles remain; from the second, the absence of a hard and elevated border, the absence of similar patches on other parts of the body, the presence of, at least, one or two herpetic vesicles, and the speedy decline of the redness, serve to establish a difference.

Herpes iris, in its erythematous stage, bears some resemblance to a variety of roseola with concentric rings.

Causes.—Herpes must be regarded as a neurotic affection, as originating in some cause which weakens the tone and vigor of a nerve or its cutaneous branches, and renders the part of the skin which it supplies more sensitive to the influence of an irritant, as of a cold wind.

This seems to be especially the case in herpes zoster, in which the neurotic affection, as indicated by neuralgia, precedes the eruption of the skin, and in which also the neurotic affection not unfrequently continues after the eruption is healed. Herpes occurs, for the most part, in young persons and females, and particularly in those who possess a delicate and irritable skin. The seasons in which the disease is most prevalent are, the spring, the summer, and the autumn. Herpes is very commonly dependent upon some disturbance of the digestive functions, or upon irritation of the respiratory mucous membrane, and may frequently be regarded as an effort of the system to eliminate some disposition to visceral disease. The ordinary exciting

causes of the affection are, irregularities in diet, exposure to cold while the body is heated, coldness and dampness of the atmosphere, a cold east or northeast wind, contact of local irritants, fatigue, moral emotions of a depressing kind, &c.

Herpes labialis not unfrequently results from the influence of cold, as in the transition from a warm atmosphere to a cold sharp wind. It is also associated with gastro-pulmonary irritation, and frequently appears as a critical sequela of fevers, catarrhs, and some affections of the viscera.

Herpes zoster frequently attacks adults and old persons, and in the latter is often a painful and distressing disease. In adults it has been observed to be more common in the male than in the female sex. The seasons most favorable to its appearance are the spring and autumn. Sometimes the affection would appear to be hereditary, and in certain seasons it has attacked so many persons as to have the character of an epidemic. In rare instances it has been observed as a critical eruption. I regard cold as its special cause.

Herpes circinatus is sometimes seen to attack several members of the same family at the same time, or consecutively. This observation, however, merely points to a similarity of exciting cause, since various experiments have shown the impossibility of propagating the eruption by inoculation.

Prognosis.—Herpes, in young persons and in the adult, is a mild disease, and is important only in relation to the visceral affections with which it may be concomitant, and of which it is frequently symptomatic; in old persons, however, it is more serious, from a disposition to gangrene of the inflamed skin, and especially to neuralgia.

Treatment.—The treatment of herpes should be mildly antiphlogistic, and should consist of gentle laxatives, diaphoretics, and diluents, unless some visceral disorder be suspected, and call for especial attention. The local management requires the aid of fomentations and emollients to relieve the local pain, unless contraindicated by position or other circumstances. In most instances a simple ointment will be found preferable to fomentations, especially when the vesicles are seated on parts of the body liable to friction or pressure. In the latter case, where some of the vesicles have burst, and the surface is bedewed with moisture, it should be dusted with starch powder.

The severe pains which often accompany herpes zoster, sometimes preceding and sometimes following it, and evidently neuralgic, should be treated with colchicum and iodide of potassium, followed by quinine; and the local suffering at the same time combated by sedatives. In three cases of this kind I found tincture of opium with tincture of aconite, rubbed into the painful part, procure relief; but in other cases the remedy has failed. Nothing can be conceived more dreadful than the pangs accompanying herpes sometimes become: a gentleman whom I once asked to give me an idea in words of the nature of his suffering, replied, "You must fancy the marrow taken out of the bones of my arm, and a rough towel threaded through them; you must then imagine two devils at work with all their strength at each end of the towel, sawing it backwards and forwards; that is what it is like." In

the region of the scapula, around the thorax and around the abdomen, the pain is sometimes dreadfully severe. Dr. Ranking, in his "Abstract," records the opinions of two gentlemen, Dr. Palmer and Mr. Humpage, on the local treatment of this painful affection; the former recommends the application of the tincture of arnica, and the internal use of the oxide of silver; the latter proposes a blister followed by a belladonna plaster. Dr. Ranking himself suggests the endermic use of morphine or electro-magnetism.

Herpes labialis is too slight to require remedial treatment; if, however, the heat, tension, and itching, are productive of much uneasiness, they may be relieved by a weak lotion of acetate of lead, or sulphate of zinc; by an ointment containing a drachm of the liquor plumbi diacetatis to an ounce of elder-flower ointment; or by the benzoated ointment of oxide of zinc.

The course of the vesicles, at an early stage, may frequently be arrested by the above lotions; when, however, the vesicles have formed, they may still be checked by puncturing them with a needle, and inserting into the puncture, for an instant, a fine point of nitrate of silver.

The other local forms of herpes, including herpes præputialis, may be treated upon the principle recommended for herpes labialis.

In *herpes zoster*, when the patient is weakly or aged, tonic remedies and a generous diet will be required. He should be careful not to lie on the affected side, lest the vesicles be ruptured, and troublesome ulcerations or gangrenous sores ensue.

When the vesicles are succeeded by excoriations or ulcerations, the ointments recommended for herpes labialis, spread upon lint, will be found useful. If the excoriations exhibit a tendency to gangrene, an ointment of nitrate of silver, containing ten grains of the salt to an ounce of simple cerate, should be used. And if the disease be accompanied with much pain, an ointment of opium, in the proportion of half a drachm of the watery extract to an ounce of simple cerate, will be found an advantageous remedy. My friend, Mr. Lay, who suffered severely from the smarting and itching attendant upon this disorder, while engaged in Beechey's expedition, had recourse to a moist cloth, which he found of great service in quieting those symptoms when they had become unbearable from the warmth of bed. Lotions of sulphate of zinc, of super-sulphate of alumina, and borate of soda, are recommended by Bateman for the same purpose.

The ectrotic treatment by caustic is applicable to herpes zoster, as well as to herpes labialis, and other varieties of the eruption. The vesicles should be carefully punctured with a needle, and the sharp point of a pencil of nitrate of silver introduced, for an instant, into the opening. By this means the progress of the vesicles may be checked, and the cure brought more speedily about than by leaving the eruption to its course.

If any tardiness be apparent in the development of the eruption, the treatment suggested by Mr. Plumbe should be adopted; namely, the application of a strip of blistering plaster on the sound skin, in the situation where the vesicles are likely to appear, or immediately ad-

joining those which are already produced. This has not only the effect of checking the extension of the disease, "but of producing a shrivelling of the vesicles already formed, and cutting short its progress altogether; avoiding at once its tediousness and all the pain attending it." Care must be taken not to apply the blister over the vesicles, lest it occasion sloughing of the derma. Moreover, Mr. Plumbe has remarked, that blisters do not rise upon the inflamed patch of herpes.

Herpes circinatas and *iris* require no special remedies; they should be treated upon the general principles above indicated, and by tonic medicines and regimen. When the circinate variety becomes chronic, Gibert recommends an ointment composed of one drachm of sulphuret of lime, fifteen grains of camphor, in powder, and one ounce of lard. If this ointment should fail, a blister will often succeed in putting a stop to the eruption.

PEMPHIGUS.

Syn. *Pompholyx. Pemphix. Fièvre bulleuse*, Fran. *Blasenausschlag; Wassenblasen*, Germ. *Pemphix*, Alibert.

Pemphigus[1] (Plate VIII.) is an eruption of bullæ of considerable size, appearing upon circular or oval erythematous patches corresponding in diameter with, or a very little larger than, the bases of the bullæ. The bullæ arise in the course of a few hours; they vary in bulk from that of a split pea to that of one valve of a walnut-shell, and occasionally they increase to the size of a fowl's egg. On their first appearance they contain a transparent, limpid, or yellowish serum, which, in a short space of time, becomes pinkish, sanguineous, or turbid, and is eventually discharged by the rupture of the bulla, or desiccates into a thin, dark-colored crust. When the bulla bursts, which it generally does in one or two days, an excoriation corresponding with its base remains behind. The disease occurs usually in successive crops; in rare instances, only, simultaneously upon all parts of the body. It may be partial or general, and may be prolonged in duration from a few days to several months, and even years.

The numerous varieties[2] of pemphigus indicated by different authors may all be embraced under the three heads of acute, chronic, and gangrenous. The first includes the pemphigus vulgaris, pompholyx benignus, and pompholyx solitarius of Willan; the second corresponds with the pompholyx diutinus of that author; while the third is the pemphigus infantilis of Willan, the pemphigus gangrenosus of Stokes. The pemphigus contagiosus of Willan appears to be based upon insufficient data.

PEMPHIGUS ACUTUS.

Syn. *Pompholyx. Pemphigus vulgaris; confluens; confertus.*

Pemphigus acutus[3] (Plate VIII.), is a rare form of cutaneous disease,

[1] Der. πίμφιξ, a bubble; πομφόλυξ, a water-bubble.

[2] Pemphigus congenitus; p. infantilis; p. simultaneus; p. successivus; p. solitarius; p. confluens; p acutus; p. chronicus; p pyreticus; p. apyreticus.

[3] Portraits of Diseases of the Skin, Plate VIII., AG.

attacking children and young persons chiefly, attended with a trifling or moderate degree of constitutional disturbance, and lasting for a longer or shorter period.[1] The disease may be partial or general, disseminated or confluent, and it occurs for the most part in successive eruptions.

The constitutional symptoms of acute pemphigus may be slight, not exceeding a trifling degree of listlessness or languor, or they may be severe, consisting of chilliness and rigors, flushes of heat, pains in the head and limbs, thirst, loss of appetite, nausea, sore throat, pain at the epigastrium, quick frequent pulse, and sometimes delirium. Irritation of the gastro-pulmonary, or of the urethro-sexual mucous membrane, is a frequent complication of the constitutional symptoms.

The milder series of the above detailed symptoms belong to the *pompholyx benignus* of Willan; the same mild constitutional affection, with sickness and languor, accompanies his *pompholyx solitarius*.

The local symptoms consist in the appearance, on the second or third day, or at a later period from the commencement of the constitutional disorder, of small red spots, accompanied by itching and a dry burning sensation. The spots speedily increase in size, and constitute circular erythematous patches, which vary in their degree of redness from a pale to a vivid tint. In the course of a few hours a vesicle rises in the middle of each patch, becomes rapidly distended with a limpid serum, and increases to the size of a hazel-nut, or large walnut. The bulla is of a circular or oval form, and frequently somewhat flattened at its summit. It usually corresponds in diameter with the breadth of the erythematous patch, which it then completely conceals; at other times it is somewhat smaller than the patch, and the latter shows around it as a narrow zone. Sometimes, again, the bulla is much smaller, and appears to be surrounded by a broad areola. The bullæ generally burst at the end of a day or two, and expose an excoriated surface, which secretes a serous fluid for a few days longer, and then becomes covered by a thin, yellowish scab, which gradually assumes a brown, and subsequently a black color. When the rupture of the bullæ does not take place, the limpid and transparent fluid which they contain assumes a yellowish and amber tint; it then becomes turbid and opaque, diminishes in quantity by absorption and evaporation, and at the end of about a week, dries up, forming a thin dark-colored scab. Occasionally the contents of the bullæ become pinkish or purplish in place of yellowish and turbid; and, when the local inflammation has been violent, they may even be mingled with lymph or pus. The scabs fall in the course of three weeks, leaving the skin beneath of a dusky red hue, but perfectly sound. The period of rupture of the bullæ is dependent in great measure upon situation, and upon the greater thickness or thinness of the epidermis. The bullæ present some variety in point of distribution; they are sometimes isolated; sometimes aggregated into clusters or confluent; and sometimes are disposed in circles around the circumference of a given

[1] Rayer relates a remarkable and interesting case of this affection, which was admitted into hospital on the 21st of August, and discharged cured on the 3d of September.

patch of erythema. The duration of the disease is regulated by the manner of its irruption; when the bullæ appear at once, the affection terminates in one or two weeks. When, however, they are developed, as usually happens, at successive periods, the disease is prolonged in a similar ratio, and may extend to three weeks or a month. In the progress of the cutaneous eruption vesicles are not unfrequently observed upon the mucous membrane of the mouth.

The fluid of pemphigus has been made the subject of chemical analysis by Scherer.[1] It had a yellowish tint, an acid reaction, a specific gravity of 1018, and deposited a sediment composed of corpuscles, which Scherer states to have resembled mucus or pus-corpuscles, but which were probably newly-formed epidermal cells. On evaporation it gave forth an odor of acetic acid, and deposited a quantity of very white albumen on being heated. It contained no trace of urea. The analysis gave the following results:

Water,	940.0
Solid constituents,	60.0
Fat containing cholesterin,	2.6
Albumen, with earthy phosphates,	48.0
Alcohol extract, with lactate of soda, and chlorides of sodium and potassium,	6.5
A substance resembling ptyalin, soluble in water,	1.9
Free acetic acid and corpuscles.	

In the same patient, five years afterwards, the proportions of water and solid constituents were 959.8, 40.2.

In certain vesicles on the abdomen, probably herpetic, from the quantity of albumen which they contained, the fluid contents, examined by Girardin, gave the following analysis:

Water,	939.500
Solid constituents,	60.500
Albumen,	49.200
Cholesterin,	6.475
Alcohol extract,	1.075
Phosphates of soda and lime, and chloride of sodium,	3.750

The urine analyzed by Heller, in a case of severe pemphigus, which proved fatal, the patient being a woman forty years of age, was acid, and its specific gravity 1017.5. It deposited a light cloudy sediment of mucus with fat-globules, urate of ammonia, and epithelium scales. His analysis is as follows:

Water,	955.80
Solid constituents,	44.20
Urea,	24.63
Uric acid,	0.58
Extractive matters,	11.79
Fixed salts,	7.20

"Of the fixed salts the earthy phosphates were normal, the sulphates much increased, and the chloride of sodium proportionally diminished. The urea is considerably above the normal average."[2]

[1] Dr. Day, in Simon's Animal Chemistry.

[2] Ibid.

In the case of a little boy, affected with acute pemphigus, my brother, Dr. Marris Wilson, found the quantity of urine passed in the twenty-four hours much below the average, namely, about twelve ounces; its specific gravity high, namely, 1033; and its reaction powerfully acid. It was of a light color, deposited on standing a light flocculent cloud containing minute crystals of oxalate of lime, and was loaded with urea. In a thousand parts the quantity of solid constituents was 76.89.[1]

In the exceedingly rare variety of pemphigus named by Willan *pompholyx solitarius*, the bulla attains the size of an orange, enlarging very rapidly, and containing several ounces of serous fluid. It is preceded by a disagreeable sensation of tingling and smarting, breaks in about forty-eight hours, and is succeeded by a superficial ulceration. At the end of one or two days after the disappearance of the first bulla, another rises in its vicinity, and pursues the same course as the preceding. In this way five or six bullæ may follow each other successively, extending the duration of the disease to eight or ten days. Willan remarks, with regard to pompholyx solitarius, that "it is a disease which rarely occurs, and seems only to affect women. I have seen three cases of it: in one, the left arm was affected; in the other two the breasts. The excoriations occasioned pain and irritation, with partial hardness in the substance of the breasts." Biett met with a chronic variety of this disease.

PEMPHIGUS CHRONICUS.

Pompholyx diutinus, Willan.

The chronic form of pemphigus is identical with the pompholyx diutinus of Willan. It is of more frequent occurrence than the acute variety, is tedious and painful in its course, always successive in its appearance, and takes place in persons of debilitated constitution of both sexes, and in aged individuals. In its eruption it is either general or partial, and occasionally it makes its attacks at a particular season, for several consecutive years, appearing, for instance, in the autumn or winter, and declining in the spring. Sometimes it lasts continuously for years.[2]

The constitutional symptoms are slight as compared with pemphigus acutus. There is usually some degree of sickness of stomach, headache, and lassitude, which precede for several days the appearance of the eruption. And if the latter be severe, the constitutional symptoms are considerably augmented. The cutaneous disease is sometimes associated with aphthæ, with considerable gastro-intestinal irritation, with dysuria and hæmaturia, and in old persons it not unfrequently terminates fatally in consequence of its complication with pulmonary disease, or with effusion into the serous cavities.

[1] For the details of this case see Portraits of Diseases of the Skin; pemphigus acutus, Plate VII., AG.

[2] Dr. Duchesne-Duparc relates that he saw, in St. Louis, a girl eighteen years of age of weakly constitution, who had never menstruated, and who had been affected with chronic pemphigus since the age of five years.

The local symptoms are ushered in with pricking and smarting of the skin, and by the eruption of a number of small reddish spots, upon which bullæ speedily appear. The bullæ increase in the course of a few hours to the size of a pea or walnut, and sometimes attain the magnitude of a fowl's egg. At the end of three or four days some of the bullæ burst, and discharge their contents, leaving behind them an angry-looking excoriation of the derma. In others the serous fluid becomes reddish and turbid, and decreases in quantity until it dries up, forming a dark-colored scab, covered with the shrivelled epidermis. As one crop disappears another is produced, so that the disease may be observed in all its stages at the same moment, and may be prolonged for several months, or with intervals for years. Occasionally the bullæ are confluent, especially when they make their appearance, which is not frequently the case, on the face.

Chronic pemphigus is sometimes complicated with prurigo, particularly in old persons; this complication excites the most distressing irritation, and frequently causes a fatal termination.

PEMPHIGUS GANGRÆNOSUS.

Syn. *Pemphigus infantilis*, Willan. *Rupia escharotica.*

This disease consists in the formation of bullæ upon somewhat prominent and purplish or livid spots. The bullæ are smaller than in the preceding varieties; they are irregular in form, and flattened at the summit, and they contain a sanguinolent serous fluid, which becomes turbid and dark-colored, or almost black. At this period, the bullæ are surrounded by a purplish areola, formed by the circumference of the livid spot upon which they are developed. At a variable period after their distension the bullæ burst, and leave at their bases unhealthy and excavated ulcers, which increase gradually in breadth and depth. The ulcers are painful; they are frequently covered with sloughs, they secrete a sanious and fetid pus, their borders are thin and inflamed, and they are slow and tedious in their cure. As soon as the ulcers have formed, other bullæ arise, and follow the same course with the preceding, and the disease generally terminates in the death of the patient, from excessive and continued irritation. This disease occurs chiefly on the lower extremities, on the trunk of the body, more particularly its anterior surface, on the neck, and on the scrotum or labia pudendi. It is accompanied with fever, sleeplessness, restlessness, and general disturbance of the nutritive functions.

Dr. Whitley Stokes, in a paper published in the *Dublin Medical Essays* for 1807, describes this disease as it makes its appearance in an epidemic form among children in Ireland, under the name of pemphigus gangrænosus. It is known in different counties of Ireland under the names of *white blisters*, *eating hive*, and *burnt holes*. Sometimes the eruption is preceded by a livid suffusion of the skin; more frequently, in a state of perfect health, one or more vesicles somewhat larger than a small-pox pustule appear, increase for two or three days, burst, and discharge a thin fluid having a disagreeable smell, limpid

in most cases, sometimes whitish and sometimes yellowish. The sore left by the breaking of the vesicles is painful, discharges a thin, fetid, ichorous fluid, ulcerates and spreads quickly, the edges of the ulcer being livid. The unfavorable signs of the disease are the rapidity of extension of the sores, their abundant and highly fetid discharge, and the blackness which commences at the edges and spreads over the entire sore.

The parts chiefly attacked are the fold of the ears, the hands or feet, generative organs, breast, groins, abdomen, and inside of the mouth and lips. "If the sores are behind the ears, they destroy the connection of the posterior cartilage with the cranium; they spread to the meatus auditorius; to the eyes, the sight of which seemed, in a few cases, to have been destroyed one or two days before death; and they sometimes extend to the vertex.

"The constitutional disturbance that accompanies this disease seems principally the effect of irritation. When the vesicles burst, the child begins to grow peevish and fretful, pale, loses its appetite, and the flesh becomes remarkably flabby. The periods of the disorder are not very regular; but it often happens about the eighth day that the pulse sinks, the lividity spreads over the whole sore, the fetor and discharge increase greatly." "Death takes place about the tenth or twelfth day, often preceded by convulsions, sometimes by extreme lividity."

PEMPHIGUS CONTAGIOSUS.—Willan founds a contagious variety of pemphigus upon the description of an endemic disease, accompanied with bullæ, which raged in Switzerland in 1752, and which is recorded by Dr. Langhans. He also alludes, in support of this variety, to the bullæ of plague, and to those which are sometimes observed in the last stage of typhus fever. The contagious variety is far from being satisfactorily established.

DIAGNOSIS.—Acute pemphigus, with its bullæ raised upon inflamed bases, bears some resemblance to erysipelas; but the number and small size of the erythematous patches of the former are easily distinguished from the extensively inflamed, the tumefied and painful surfaces presented by erysipelas. The duration of the disease, with the exceeding mildness of the constitutional symptoms, are the principal characteristics of the chronic form of pemphigus.

CAUSES.—Acute pemphigus attacks children and young persons chiefly; occasionally it appears as a congenital affection, and is sometimes of hereditary origin. The season during which it is most prevalent is the summer. Its occasional causes are teething, gastric and intestinal irritation, excess in diet, deficient innervation, irritability of system, mental affections, amenorrhœa and dysmenorrhœa. It sometimes results from the constitutional irritation caused by the introduction of the vaccine virus into the system. It has also been observed as a complication of intermittent fever, and several instances are recorded of its occurrence as an epidemic affection. A variety named *pemphigus indicus* is described by Sauvages as a symptom of dysentery.

Chronic pemphigus affects principally aged persons, and adults with debilitated constitutions. It is also, but less frequently, met with in children. It appears usually in the autumn or winter season. The most fruitful causes of chronic pemphigus are those of a depressing kind, such as fatigue, anxiety, intemperate habits, bad food, chronic irritation of the gastro-pulmonary or genito-urinary mucous membrane, amenorrhœa, residence in damp and unhealthy situations, exposure to cold, and starvation. I once saw the disease as a sequela of scarlatina. In those most liable to this affection there is an habitual dryness of skin and deficiency of cutaneous secretion. Biett remarks that he has frequently found a fatty liver in persons who have died of chronic pemphigus.

Dr. Whitley Stokes remarks that the causes of pemphigus gangrænosus are obscure. It seems confined to children, and attacks the finest in preference; the children of the poor more frequently than those of the affluent; and those who live in damp situations seem more particularly subject to it than others. The disease is more prevalent in summer than in winter, and appears to be infectious, though obscurely so.

Two cases that have recently come under my notice led me to believe that pemphigus may sometimes result from the inoculation of the system by some poisonous principle. One of these cases was that of a surgeon who, eighteen months previously, punctured his right hand with a lancet which had just been used for opening a thecal abscess. The arm became swollen as high as the axilla, and was three weeks before it got well. Between three and four weeks after the cure of the arm a crop of pemphigus made its appearance on his left thigh and leg, and has continued to show itself from time to time up to the present period. The development of the bullæ is always preceded by a febrile attack; there is a scalding sensation in the skin, and the next morning a crop of full-grown bullæ are seen.

The second case was that of a girl, aged twenty-two, who "poisoned" her right hand seven years ago, in cleaning brass with a red paste. Three or four days after the injury a number of ecchymosed spots and bladders made their appearance on her wrist and forearm, and have continued to trouble her until the present time.

Prognosis.—Pemphigus is dangerous in proportion to its complications, and to the constitutional disturbance of the system. The acute variety is of little importance, but the chronic affection is always obstinate, and sometimes fatal, particularly in old persons. The disease would appear to exert sometimes a beneficial effect upon the system; thus Rayer narrates that he "once saw a man who, after having had several attacks of hæmoptysis, became subject to chronic pemphigus of the legs, and from this period the bleeding from the lungs did not recur. The cure of pemphigus has, in some cases, been observed to be followed by various ill consequences."

Treatment.—When the febrile symptoms are acute, they must be met with purgatives, salines, and antiphlogistic regimen. The natural tendency of the disease is, however, towards debility, and it will generally be found needful to have early recourse to tonics.

In the chronic forms of the disease, tonics must be employed at once, the best of them being acids and bark, the latter either in the form of infusion or quinine. A valuable remedy in pemphigus is the hydriodate of potass. In those cases in which the symptoms present obvious indications of diseased action in any of the organs or viscera, such disorder should be made the especial aim of our treatment. Thus, when the alimentary canal is in a state of irritation, that irritation must be calmed; when the mucous membrane of the bronchia is the seat of morbid action, counterirritants must be applied to the chest, and such other means adopted as will relieve those symptoms; when the uterine function is disordered, ferruginous remedies must be administered. Restlessness and pain will be quieted by opiates. In an obstinate case of pemphigus, Rayer had recourse to arseniate of soda in small doses; in similar cases I have found Fowler's solution a useful remedy.

The inflamed skin should then be thickly anointed with the benzoated zinc ointment; sometimes the old Turner's cerate or calamine ointment forms a convenient change, and sometimes the unguentum cetacei with liquor plumbi; the unguentum plumbi compositum, the unguentum cretæ compositum, the unguentum mellis, the unguentum cetacei with Peruvian balsam (℥j ad ℥j), the diluted juniper tar ointment, or an ointment of the nitrate of silver (gr. ij—vj ad ℥j) may be preferred. When moisture exudes from the bullæ, or from the excoriated skin, the surface may be dusted with the oxide of zinc or starch powder; and if the excoriations be very irritable and tender, a weak solution of the nitrate of silver in distilled water (gr. j—iij ad ℥j) will diminish the morbid sensitiveness. Fomentations are rarely of any advantage, and where the surface affected is large there would be difficulty in applying them.

In the epidemic pemphigus gangrænosus, Dr. Stokes recommends an ointment of scrophularia nodosa, containing as much green vegetable matter as possible. He remarks that this is a traditional remedy, but he found it more successful than any other plan of treatment. The ointment should be warmed until it possesses the consistence of honey, and then laid on with a brush, and dressed with the same spread upon lint. The utmost gentleness should be used, and the dressing renewed every six hours. Where there is swelling of the surrounding parts, or when any powder has been previously used, he applies, in the first instance, a poultice of porter and oatmeal, or a carrot poultice in a state of fermentation.

The diet in pemphigus, as soon as the febrile symptoms have subsided, should be nutritive and generous.

CHAPTER X.

DISEASES ARISING FROM GENERAL CAUSES.

FURUNCULAR ERUPTIONS.

UNDER the head of furuncular eruptions, I propose to consider that common and well-known affliction of the skin, the boil, or FURUNCULUS, and that greater boil, the carbuncle, or ANTHRAX, with whatever modifications they may chance to present. The general character of the furuncular eruption is an inflammation, extending deeply into the skin, forming more or less prominence on the surface, and resulting in the loss of vitality of a portion of the substance of the derma. The portion of the substance of the skin so destroyed is the heart of the boil, the core (*cœur*), and the suppuration which follows has for its object the separation and expulsion of the core. The degree of prominence of the boil would seem to depend on the depth of the portion of the skin attacked; when the latter is superficial, involving parts which are looser in texture, and more susceptible of distension, the prominence is greatest, but when the inflammation sinks deeply, the prominence is less, although the mischief may be considerably greater, and the case in every way more serious, being attended both with a greater amount of pain, and being much slower in its progress. This, and the extent of the skin attacked, are the prime distinctions between the furunculus and the carbuncle; in furunculus there is but one core, and the core is less deep; in carbuncle there is more than one core, and these cores extend deeply into the derma. Thus mere size is only a secondary feature in the diagnosis between furuncle and carbuncle; a large boil may be larger than a small carbuncle; although the carbuncle, being an aggregated boil, is generally much more extensive than the furunculus, sometimes reaching to a diameter of six or more inches.

The cutaneous diseases which have formed the subjects of the previous chapters, have all been superficial in comparison with the furuncular eruption, and have resulted, as we have seen, in mere exfoliation of the cuticle, in effusion of lymph, and formation of pus, with no injury to the vitality of the skin: but now we have before us a disease in which the mortification of the part attacked is the principal and leading character; there is a concentration of inflammation; that inflammation is of a destructive kind, and the death of the part affected is the immediate consequence. In a pathological point of view, I am of opinion that the purpose of the inflammation is elimination; that the blood hurried on by the inflammatory impetus centres in a follicle, or several adjacent follicles, the representatives of the glandular function of the skin; that partly from the violence

of the inflammatory impetus, and partly from the dense nature of the structure of that portion of the skin surrounding the follicle, the blood is arrested in its current, it becomes stagnant, and the part which it has ceased to supply dies, while the stagnant elements of the blood are by a reparative process converted into pus, and constitute the subsequent suppuration.

The characters of distinction between furunculus and anthrax relate to their prominence, depth, breadth, color, number of cores, and degree of pain. Furunculus is more prominent than anthrax, but the latter extends most deeply into the skin, and involves a greater breadth of the structure of the derma. The color of furunculus is a deep red, becoming, as the disease advances, more or less dull and bluish; that of anthrax presents the same tints in a heightened degree, the deep red is still deeper and darker, often approaching a mahogany hue, and the bluish tint of furunculus becomes a deep purple and livid tint in anthrax. The core, which is single in furunculus, may be multiplied to twenty or thirty in anthrax, until the numerous openings formed on its surface for the exit of the cores give it the appearance of a sieve or cullender. Lastly, the pain, severe in furunculus, is more intense and more burning in anthrax.

Furunculus and anthrax, together with HORDEOLUM, or sty, which is a small boil occurring upon the edge of the eyelids, in connection with one of the Meibomian glands, are grouped by Willan under the genus PHYMA; the latter term φῦμα derived from φύω, produco, signifying a tuber, tubercle, or small swelling; and applied by Hippocrates and the older writers to a suppurating tumor; hence the designations phyma furunculus, phyma hordeolum, and phyma anthrax. Phyma is the first genus of the Order Tubercula of Willan; Plenck makes it a genus of his Class Bullæ, under the popular term "Eiterblasen," *pus-bladder;* while he places Terminthus, with the popular signification "Erbsenblattern," *pea-bladders*, among Pustulæ. The term furunculus is derived from *furere*, to rage, and is expressive of the severity of the pain which often accompanies this eruption; while the term anthrax, ἄνθραξ, carbo, in quo ἀνθεῖ, id est, floret ignis; a burning coal; indicates a greater degree of severity, and an intense burning pain. To a boil which is more painful at night than during the day, the term EPINYCTIS (ἐπινυκτις ὅτι νυκτὸρ ἔγενετο, quoniam noctu oritur) has been applied. Anthrax presents two varieties, not recognized at the present day, namely, pruna and terminthus. PRUNA, from its resemblance to a small plum, a term applied by Avicenna, is a carbuncle surmounted by a black eschar; while TERMINTHUS, or terebinthus, is a variety of carbuncle of which the core or slough has been likened in shape and color to the ripe cone of the pinus abies, or turpentine tree.

The diseases included in the present chapter, as constituting the family of furuncular phymata, are, therefore, three in number, namely, furunculus, hordeolum, and anthrax.

FURUNCULUS.

Syn. *Phyma furunculus. Boil.*

Furunculus, or boil, is a small tumor, more or less prominent and conical, of a vivid or deep red color, hard to the touch, excessively tender and painful, slow in reaching maturity, suppurating imperfectly, and containing a central core or slough of mortified cutaneous tissue. After the ejection and separation of a grayish and pulpy slough, the sore heals slowly, the affected skin remains for some time congested and discolored, and a permanent cicatrix is left behind.

Boils may occur on any and all parts of the body; they rarely appear as a general eruption, but are successive in their invasion; and are usually more abundant upon some one region of the body than upon the rest, although by no means confined to a single region. Their common locality is the back of the neck, the shoulders, the armpits, the wrists and hands, the buttock, the perineum, the labia pudendi, the thighs, and the legs; and they are more commonly met with in the thick skin of the back of the trunk and outer side of the limbs than upon the front of the trunk and inside of the limbs. This remark does not, however, apply to the eruption when it attacks the armpits, the labia pudendi, the meatus auris, and the inside of the buttock, all common localities. Among other situations, I have seen boils on the eyelids, on the nose and ears, on the integument around the mouth, on the cheeks, and on the scalp.

The boil begins as a small red point in the skin, frequently painful from its origin, and tender to the touch; passing the finger over it, it is felt to be harder, and deeper than a common papule, and the tissue around it is evidently condensed; it is gradually and slowly expanding itself in the skin, and threatening the mischief which never fails to follow. Slow and certain in its progress, the integument is gradually raised into a prominence of a more or less conical figure, the surface is at first red, then vividly red, then purplish red, sometimes a deep dull red, and sometimes purple, and even livid. After some days (four to six) a point is seen in the centre of the cone, showing that pus has commenced to form, or a blister is raised, the skin gives way, the pus escapes, the core or slough is brought into view, and, after a time, several (four to six), often many days, the slough is sufficiently loosened by the formation of pus between it and the sound tissue, to be thrown off; granulations are then formed on the surface of the cavity, the cavity contracts, the granulations shoot up and reach the surface, and cicatrization takes place; the process of reparation being extremely active (two to four days) when compared with that of the separation of the slough.

The process now described is attended with pain, intense pain, *crede experto;* the tumor is excessively tender, "as sore as a bile," and the pain is curiously increased at night, reminding us of one of the synonyms of the disease, namely, epinyctis. The great pain at night very probably results from the inactivity of the muscular system and the relaxation of the mind from its daily office, aided, no

doubt, by the horizontal position of the body, the warmth of bed, the stillness of the time, and the necessity for a state of calm and insensibility. The pain attendant on a single boil is prolonged for two, three, and sometimes four days; and when the eruption is successive, the pain of one is only obliterated by that of another, until the patient is worn out with suffering. Some persons are so happily constituted as to their nervous system, that they suffer but little, while others endure the most dreadful agony. Certain differences naturally result from the seat of a boil; a small boil in the meatus of the ear pressing upon tissues incapable of resistance from their inclosure by bone and confinement by strong ligamentous bands, almost crushing the numerous and sensitive nerves of that region, nerves which are in intimate communication with all the most important nervous trunks of the body, is painful to agony, to frenzy; while, by the same patient, a large boil in another situation, where from the nature of the tissues every facility of expansion exists, would be regarded as a mere inconvenience. A boil is painful in relation to the density or confinement of the tissues in which it occurs, and in relation to the neighborhood of sensitive nerves. A boil in a part of the skin supplied by the trifacial nerve, and involving a filament of that nerve, is intensely painful; so is a boil in the skin of the nose, tied down to the cartilages by an unyielding fibrous tissue; or in the lip, where every beat of the coronary artery vibrates through the system; in the perineum, where the skin is also fixed by strong fibrous tissue; in the labium pudendi, where the part is apt to swell to almost bursting: in the armpit, where many filaments of nerves are distributed, or on the fingers, where the nerves are also abundant and sensitive.

In an attack of boils, it is not all that run the course described in a preceding paragraph; some stop at different periods of their progress; some do not survive the stage of pimples; others acquire a certain size, but neither suppurate nor slough; these are the so-called *blind boils:* they gradually and slowly subside; their contents, if any, are absorbed; they entitle themselves to the distinction of *indolent boils;* while a certain number only reach perfection. It sometimes happens that the local inflammation is not confined to the boil itself; it spreads to the surrounding tissue; the whole region is swollen and painful, and occasionally develops subcutaneous abscesses; and sometimes the absorbent vessels become inflamed, and the inflammation is propagated to the lymphatic glands, producing swelling, and sometimes suppuration of those organs. Enlarged lymphatic glands in the groin from boils on the buttock or pudendum are not uncommon, and enlarged axillary glands, from boils on the hand or wrist, or in the armpit itself, are comparatively frequent.

Furunculus is commonly accompanied with constitutional symptoms of a very slight description; but sometimes, when the pain is very intense and prolonged, the feverish symptoms run sufficiently high to call for antiphlogistic treatment. The pulse may be quickened, there may be pain and tightness of the head, thirst, dryness of the tongue, languor, and restlessness, and the secretions may be deficient in quantity or arrested; added to which, when the pain is excessive,

or when the boil is developed in the meatus auris, there may be delirium.

HORDEOLUM.

Syn. *Phyma hordeolum. Stigh; stithe; stihan;*[1] *stian; sty.*

Hordeolum, or sty, is a small boil occurring upon the edge of the eyelid, and involving a Meibomian gland. In its progress it is indolent, coming slowly to maturity, and presenting at its summit a single purulent point, and sometimes two or three. It is attended with much pain, causes swelling, and sometimes œdema of the eyelids, and diminishes but slowly in size as it subsides, sometimes leaving behind it a chronic redness, which may last for several months. Commonly, hordeolum is single; sometimes two are met with on the same lid; sometimes one or more exist on both lids; and sometimes both eyes are affected at the same time.

ANTHRAX.

Syn. *Phyma anthrax. Carbuncle. Ignis Persicus.*

Anthrax, or carbuncle, is a hard, circumscribed, flattened tumor, very little raised above the level of the skin, but extending deeply (an inch or more) into the cutaneous tissue. It is red in color, the redness being more or less vivid or dark at first, often presenting a mahogany tint; then becoming more or less purple, then livid; and after the separation of the sloughs and the healing of the skin, leaving behind it a chronic redness and deep brown stain, which lasts for a considerable time. The pain of carbuncle is very severe, and of the throbbing and burning kind; the latter character having gained for it its twofold appellation of carbuncle and anthrax; carbuncle signifying a little coal, and anthrax that same coal efflorescent with fire. When it has attained its full size, and the surface is purple or livid, the cuticle becomes raised into one or more blisters, numerous suppurating points appear in the skin, and these suppurating points are succeeded by perforations, through which the core issues from the stratum beneath in the form of sloughs, the sloughs being the fibrous tissue of the derma, converted into a grayish and whitish pulp, more or less soft and viscous, and mingled with an ichorous, purulent, and sanious discharge. Perforated all over its surface in this way, the face of the carbuncle has the appearance of a cullender or sieve. Sometimes, instead of numerous perforations, a portion of the skin of considerable size loses its vitality, and becomes converted into a black eschar, and the slough which follows is homogeneous and extensive. This is the *pruna*, or eschar carbuncle. At other times, and also as a consequence of the loss of vitality of a considerable portion of the centre of the carbuncle, the brownish or reddish-brown slough, isolated by suppuration from the surrounding living parts, broader at its base than its summit, and foliated on the sides by successive exten-

[1] Stihan, a Saxon word signifying arising, springing up, or ascent. "To sty," as used by Spenser, means "to soar, to ascend," as in the following couplet:

"To climb aloft and others to excel,
That was ambition and desire to *sty*."

sion of the sphacelus, has somewhat of the appearance of the ripened cone or fruit of a fir-tree. This idea in the poetical mind of our forefathers gave origin to the name *terminthus* applied to this variety of carbuncle; terminthus being a mode of writing terebinthus, and referring to the turpentine tree, the pinus abies.

Carbuncle, unlike boil, is generally single, and attains a considerable size; sometimes, when small, there may be several dispersed on various parts of the body, as not unfrequently occurs in the furuncular epidemic at present existing.[1] Commonly, the carbuncle varies from two to six or eight inches in diameter, and one inch to one and a half in depth; it is hard and dense to the touch, and feels as though it were imbedded in the skin. It is usually met with on the back of the neck, close to the occiput, or upon the back of the trunk. I have seen it frequently on the shoulder, the side of the trunk, or the loins; and less frequently on the limbs.

A large carbuncle is at all times a dangerous complaint, on account of the great pain which it occasions, the long continuance of that pain, the exhausting process requisite to separate the slough, and the irritative fever with which it is attended; added to all, is the fact of its very existence being due to enfeebled powers of constitution; but the danger of carbuncle is vastly increased by its occurrence on the nape of the neck, in which situation it is apt to excite erysipelas of a serious kind, and often give rise to congestion of the brain, an event which is usually fatal.

Carbuncle is accompanied with more or less irritative fever and general disturbance of the nutritive, vascular, and nervous systems. It occasions loss of appetite and loss of sleep; and when the pain is severe the patient is not unfrequently delirious.

Diagnosis.—The distinguishing characters of the furuncular eruptions are, their hardness, redness, depth in the substance of the skin, pain, and, at a later period, the deeper tint of color which they acquire, their perforation at the summit, the escape of so small and insignificant a quantity of pus, and the subsequent appearance of the core or slough. Hordeolum, moreover, is known by its seat of development. The special characters which distinguish furunculus and anthrax, at the first appearance of the latter, are the conical shape of furunculus, and the flatness of surface and greater depth of base of carbuncle; at a later period, bulk, number of cores, tendency to suppurate imperfectly in furunculus and slough in carbuncle, are superadded as further distinguishing features. The mutual relations and resemblances of the two diseases are further exhibited in the name which has been given to the smaller carbuncles, when only three or four cores exist, namely, furunculus anthracoides.

Cause.—In referring to the books of our fathers of a few years back, we might be led to infer that boils were a proof of exuberant health, that they were indicative only of the most exalted powers of constitution, and that the *plague of boils* was one of the most desirable

[1] This furuncular epidemic commenced in 1852 or 1853, and in 1856 is still active.

events that could happen to youth and manhood. "The boil," says Mason Good, "is found in persons of an entonic or phlogotic habit, with a peculiar susceptibility of irritation;" therefore, he continues, this tumor is "chiefly found in persons of high health and in the vigor of youth." At the present day, however, this is certainly not the fact, for we see boils associated with debility in every degree; we are, therefore, driven to the conclusion, that either the human constitution must have undergone a change since the time of our ancestors, or that altered atmospheric conditions have induced an alteration in the diseases of man. Probably both of these propositions are true; for, with regard to the first, we know that the free use of the lancet which was made by our predecessors could not be tolerated at the present time; and with regard to the latter, we are aware that diseases of dyscrasia have increased of late years, and go on increasing; and that the general tendency of disease is to assume a low and debilitated form.

During the last four years, namely, from 1852 to 1856, there has existed amongst us, and still continues to exist, an epidemic of boils; they afflict persons of both sexes, at all ages, and all seasons of the year, but I have never seen them occur in any one possessing genuine good health; there is always mal-assimilation, often cachexia, and frequently the boils are associated with other forms of cutaneous disease, such as eczema or acne. In this so-called furuncular epidemic the boils are for the most part small, and they have a frequent tendency to put on that form which is termed *furunculus anthracoides*, many of them having the character of small carbuncles rather than boils. They are also not unfrequently associatad with the *push*, a small cutaneous phlegmon terminating in abscess; and sometimes large collections of pus are formed in the neighborhood of the boils, as when they occur in the axilla or in the labium pudendi.

The anthrax or carbuncle is a disease of the latter half of life, and of a debilitated constitution, being always associated with cachexia, and frequently with the gouty diathesis. This has always appeared to me to be the active cause of that monster carbuncle which is apt to form upon the back of the neck; and the cerebral congestion which frequently follow in its trains is a gouty congestion, allied to the gouty apoplexy which was so common in the winter of 1855–56, as almost to appear in the light of an epidemic. John Hunter remarks that carbuncle is a disease of a full habit and good living, and almost exclusively confined to the richer classes, and that he never saw but one case in hospital. This was, no doubt, true at the time that he wrote; it may have been true also in reference to the selection of cases for treatment in hospitals, but it is directly opposed to my own experience; I have repeatedly seen carbuncle in the parish-workhouse, and, among the better class, in persons who were strictly abstemious and moderate in their habits, whose only excess was in mental pursuits, which indeed is a great source of deterioration and debility of the physical powers.

Prognosis.—Furunculus, however abundant, is not dangerous, and with the restoration of the general powers is sure to get well. Anthrax is only dangerous when it occurs in a debilitated and

exhausted constitution; when it is developed on the occiput and back of the neck; and when any excess of gouty salts is allowed to take possession of the blood during the progress of the disease or its treatment.

TREATMENT.—"Bleed, purge," say our ancestors; "Don't bleed, don't purge," is the voice of the present day. Empty the bowels with mild aperients, restore the secretions as they may appear to require, but have the tonics close at hand for ready use as soon as these indications are fulfilled; carefully avoid depressing the system farther than it is already depressed. I return to the enunciation of my law of treatment of cutaneous disease, to which the furuncular eruptions form no exception. ELIMINATE, for elimination is necessary; RESTORE TONE, for tone is wanting, and the prime cause of the defect of assimilation; ALLEVIATE THE LOCAL DISTRESS as best you may.

We all know the improvement of power which results from the action of a simple aperient, when the system is weighted down, is under a cloud of its own morbid humors; relieve this. When there has been feverishness, as is generally the case where much pain exists, particularly in carbuncle, I have followed up aperients, or combined with them antiphlogistic and effervescent salines; I have secured healthy secretions, and then I have attacked the disease with tonics; with the nitro-muriatic acid and gentian, or calumba; with cinchona and sulphuric acid; with quinine and sulphuric acid; with the citrate of iron and quinine and citric acid, &c. It is astonishing, in these *surgical cases*, how little is left for the surgeon to do, if the physician play his part well.

In anthrax the gouty salts are rarely absent; therefore we must combine with our aperients, bitters and alkalies, gentian, calumba, quassia, chamomile, hop, taraxacum, with bicarbonate of potash (not soda), liquor potassæ, iodide of potash, nitrate of potash, sulphate of potash, tartrate of potash, lemon-juice, &c.; but we must bear in mind, at the same time, that all alkalies are lowering, are debilitating, and can only be used for a time, to be quickly followed by the mineral acids and bitters. Sedatives may be necessary both in furunculus and anthrax, and can be used with safety after the bowels are thoroughly relieved and the secretions regulated; and, with the same precaution, recourse may be had, if thought desirable, to colchicum.

So troublesome and painful a disorder as furunculus has naturally suggested a variety of empirical remedies, which have obtained, from time to time, more or less credit, partly from the vehemence with which their merits have been extolled, and partly from some intrinsic value really existing in them. In some instances the principle of action of empirical remedies is obvious, and they are found to derive their reputation from their accidental use at the right moment, while at any other moment they would be mischievous and often dangerous; in others it is hypothetical, probably producing some chemical alteration in the composition of the blood, or affording an element necessary for assimilation. Of this latter class is *yeast;* yeast taken in doses of an ounce, three times a day, is said to cure the furuncular diathesis. I have no experience of the remedy, and should have no objection to make trial

of it, *after* I had prepared the system by the proper eliminants, and when the necessity for tonics was not a more presssing indication. I feel disinclined to speculate upon the "modus operandi" of yeast, until the fact of its usefulness is more fully established. As an external remedy, yeast, in certain cases, is amongst our best local applications.

The diet in furunculus, hordeolum, and anthrax, should be generous and nutritious, with a fair proportion of stimulus; sugar, potatoes, and beer, should be avoided, but meat and wine taken in moderation, and regulated according to the previous habits of the patient. Of wines, sherry, claret, dry champagne, and the Rhenish wines, are the best; port, or rather the composition which goes by that name, the worst.

And now as to local treatment, the last and least. Boils and carbuncles may be checked in their progress, and at least prevented reaching their full extent of size, by cold applications, by the liquor plumbi lotion, by the liquor plumbi diacetatis used pure, and pencilled on the coming tumor, and by an opium plaster spread on wash leather; other remedies which I do not hold in the same repute, are pencilling with a solution of nitrate of silver in nitric æther (ten grains to the ounce); compound tincture of iodine, &c.

When the boil or carbuncle advances in spite of these means, it should be covered with water-dressing, with Alison's prepared corium, or a linseed poultice; and when it breaks, yeast may be added to the linseed poultice. The question often arises in the course of the treatment of boils, should they be punctured with the lancet? and when? Opinion is divided upon this question. I am against interfering with them unless the pain be very severe, or the boils threaten to assume a large size; then, undoubtedly, advantage may be gained by free incision; such an incision as will arrest the inflammatory action by depletion, and relieve the tension, which is the chief cause of pain. Again, if the indication point to incision, the sooner it be performed the better; after suppuration is established it is comparatively useless.

Taking the relief of tension and consequent pain, and the local abstraction of blood as the leading indications to determine the question of incision, we need never be at a loss to decide when it should be performed; and this question being set at rest, another arises as to how the incision should be practised. It should be free and deep, it should completely bisect the tumor, and if the tumor be large, the incision must be crucial; a small incision does not effect the objects we have in view, it neither relieves the tension, nor does it unload the vessels completely, but, on the contrary, becomes an irritant, and adds to the evil which we are attempting to remedy. Incision must be thorough or none, there can be no intermediate course; and neglect of this aphorism has brought incision into popular discredit. I must not, however, be supposed to recommend the indiscriminate use of the lancet or knife; all I wish to urge is, that if it be right to do, it should be done completely or not at all.

In practising an incision in the case of boils and carbuncles, there

may be present to our mind the possibility of an unseemly scar following the operation, and the pain which we are about to inflict on our patient. The first of these considerations applies chiefly to cases where the boil is in sight, as upon the face and neck, and may be met by regulating the extent and direction of the incision, which latter should always correspond with the natural folds of the skin. The other consideration, namely, that of the pain of the operation, may happily be controlled by chloroform, or by the congelation of the part with ice, according to the plan of Dr. James Arnott.

Incision may, therefore, be practised on boils for the purpose of cutting short their progress, and as an ectrotic method of treatment: or they may be treated according to the plan previously indicated, by cold applications at first, and then by fomentation and poultices; the multiple boil, or furunculus anthracoides, will more frequently require incision than the simple furuncle; and in anthrax the incision can hardly be dispensed with. If the carbuncle be treated for a while by cooling applications, fomentations, and poultices, and if, in spite of these remedies, it continue to increase in size, to give much pain, and excite considerable irritative fever, it must be incised at once, and without delay; for unless this be done, exhaustion will soon follow, with delirium, and sloughing of the tumor to a greater or less extent.

When a carbuncle is freely incised, the surface of the section is seen to be studded all over with the yellow and gray spots of the pus and sloughs; and the substance of the hypertrophied derma looks spongy and worm-eaten; sometimes large sloughs are brought into view, and a free exit is established for the stagnated blood, and pent-up collections of pus and dead fibrous tissue. In debilitated and worn-out constitutions the loss of blood which follows the section of a carbuncle may be supposed to increase the exhaustion of the patient, but that is really not the case unless the hemorrhage be excessive. It is surprising how much blood may be lost without inconvenience to the patient, the loss being completely compensated by the relief from pain and suffering which immediately succeeds the operation.

Added to the other advantages which result from the treatment of carbuncle by incision is the saving of the skin from destruction by sloughing, a matter of importance in connection with the healing of the ulcer; for, where much integument is lost, the cure of the ulcer is slow and protracted, and the cicatrix imperfect and unsightly. To obviate the pain of incision and the loss of blood attendant upon the operation, it has been proposed to open the carbuncle by means of the caustic potash; but this mode of proceeding offers a more than counterbalancing amount of objections; the vessels are not relieved of their surcharge of blood, as in the plan by incision, and the destruction of integument by the caustic induces all the worst local consequences of carbuncle in respect of the healing of the ulcer and the production of an ugly cicatrix.

During the suppurating and sloughing stage the carbuncle should be kept diligently poulticed with the linseed-poultice, the carrot-poultice, or the linseed-poultice with yeast; or, when the weight and bulk of a poultice are objectionable, it may be kept covered with that

excellent application, the invention of Dr. Scott Alison, the prepared corium or lambskin. The prepared corium, when saturated with water, is extremely soft, pulpy, adhesive and light, and possesses most of the advantages of a poultice without its objectionable qualities.

Daniel Turner gives the following admirable account of his treatment of a furuncle, the "largest bile" he had ever seen: "When it was arrived to a cone, and I perceived the matter made, I passed in a lancet, and discharged a considerable quantity of well-concocted pus, under which, after two or three days' time, I found a large core or slough, extending, under the lips, the whole compass of the tumor; to come at which I was under necessity to dilate both upwards and downwards; then, filling up the ulcer with præcipitatum rubrum, and a pledgit spread with basilicon over all, I dressed him up, and left this dressing on for two days; after removing which there came out therewith about one-half of the said slough. I continued this way of dressing till the ulcer was *mundified*, and being *incarned* with a mixture of the same basilicon and precipitate, *cicatrized* with dry lint and my ceratum de lapide calaminare; more examples I think needless."[1]

The local treatment of furuncular eruption may be summed in a few words: First, allay the rising inflammation; secondly, when the inflammation has reached its height, favor the formation of pus by means of the linseed-poultice; and thirdly, when the tumor has burst or been opened, and the process of separation of the slough moves tardily, assist that process by gentle stimulation. For the first of these three indications cooling and soothing applications are needed; for the second, warmth and moisture; for the third, stimulating remedies, such as the red precipitate and basilicon mentioned by Turner. The right remedy in the right place and at the right time, is an aphorism as applicable to medicine as to politics. In the employment of stimulants we must avoid irritation; and a stimulant without irritation, and admitting of being graduated to any extent, we have in pressure, pressure by means of adhesive plaster, either the simple emplastrum plumbi on linen, calico, or wash-leather, or the emplastrum galbani et opii. In carbuncle, pressure applied in this way is invaluable for aiding the separation and expulsion of the sloughs. The coating of plaster has the further good effect of maintaining a proper degree of moisture and warmth of the part.

Viewed according to this standard, we can understand the value and proper time for application of various popular and domestic remedies which have a reputation in the treatment of boils; for example, the split fig, the honey poultice, and the cobblers'-wax plaster. The honey poultice consists of half an ounce of honey and the same quantity of melted lard, with the yolk of an egg, well mixed together, and inspissated to the proper degree by the addition of flour. The cobblers'-wax plaster is to be regarded as a digestive remedy of a somewhat active kind, suited only to the coarse skins and coarser podices of the rural population by whom it is employed. Turner

[1] De Morbis Cutaneis. A treatise of diseases incident to the skin. Fourth Edition, 1731, page 117.

observes that "the common people apply shoemaker's wax, a very uneasy application upon so tender a part;" and he continues, "melilot emplaster, or basilicon, used by others, are much preferable, which both suppurate and often heal." Among the remedies in use in his time were a poultice made by boiling figs in milk, the lily root boiled in milk, and linseed boiled in milk; these applications were frequently mixed together, and used in combination.

The treatment of hordeolum should be the same as that of furunculus: cooling lotions to subdue heat and inflammation during the first stage; warm fomentations and poultices to encourage suppuration as soon as the first period is passed; stimulants, such as the unguentum hydrargyri nitratis diluted, to disperse any swelling or induration that may be left after the matter is evacuated, and restore the part to its normal state. Constitutional treatment should not be neglected, the principle of treatment being the same as that for boils.

CHAPTER XI.

DISEASES ARISING FROM GENERAL CAUSES.

SCORBUTIC ERUPTION.

UNDER the designation of scorbutic eruption I propose to describe a peculiar disease, which is characterized by the extravasation or effusion of blood into the tissue of the skin, the blood so effused giving rise to the production of purple and livid spots. The color of the spots has gained for the disease the name of PURPURA; while the spots, presenting considerable variety of form and size, have been termed *stigmata*, *petechiæ*, *vibices*, and *ecchymoses*, or ecchymomata. Stigma is the smallest kind of spot, a mere point or speck; petechiæ are small round spots, of about the size and bearing a close resemblance to flea-bites (hence their name), but without the central point which marks the puncture made by the lancets of the insect; vibices are larger than petechiæ, and irregular in form, frequently resulting from the aggregation of several of the latter; while ecchymoses, or ecchymomata, are distinct and palpable extravasations of blood, presenting every variety of figure and dimension.

Willan in his classification places purpura in the order Exanthemata, defining it as "an efflorescence, consisting of small, distinct, purple specks and patches, attended with general debility, but not always with fever." In the same group are assembled rubeola, scarlatina, urticaria, roseola, and erythema; purpura occupying a position between the two latter. With rubeola and scarlatina, purpura has no relation whatever, proceeding from a different nature of cause, and being totally unlike in its phenomena; with urticaria it has a slight tie, as presenting a variety in which a rounded, button-like elevation, very similar to urticaria, occurs, the variety being

distinguished by the appellation of purpura urticans. To roseola it also bears a resemblance, in the bruise-like vibices, ecchymoses, and stains which follow some varieties of that eruption; and to erythema it is distinctly allied, in its mode of manifestation on the skin. Nevertheless, with all the foregoing points of similarity, purpura has appeared to me to be sufficiently distinct from the whole of these affections to merit the position in which I have placed it, namely, at the end of the seven forms of cutaneous eruption which originate in general causes.

With the exception of the vibices and bruise-like stains which follow some of the varieties of roseola, purpura is sufficiently distinct to incur no risk of being mistaken for any other eruption of the skin. The deep red, blood-like, purple and livid spots occasioned by the blood particles escaped from their vessels, are totally different in color from the redness which is the result of congestion of the capillaries; in the latter case, pressure by the finger empties the cutaneous vessels, and the congested spots, however vivid, immediately disappear; but in purpura they are permanent under pressure, the effused blood may be compressed, but cannot be displaced from its position, and the spots, consequently, remain unchanged. Their ultimate removal from the skin is the result of absorption.

In essential nature, purpura is an escape of blood from the capillary vessels, in other words, an extravasation of blood, in which morbid phenomenon both blood and bloodvessels participate. The blood itself is altered in quality, and deficient in fibrinous elements; while the capillaries are no doubt softened in texture, and yield before the pressure of the circulation or any accidental pressure applied to the skin; in a word, there exists a state of general cacochymia and dyscrasia, of which the morbid constitution of the blood and the general want of tone of all the tissues of the body, are but a part.

Let us now proceed to examine the particular symptoms of this disease and its varieties.

PURPURA.

Syn. *Purpurata apyreta. Purpura chronica. Porphyra*, Mason Good. *Hæmorrhœa petechialis*, Adair. *Phœnigmus petechialis*, Sauvages. *Petechiæ sine febre. Petechiæ mendaces. Morbus pulicaris sine febre*, Amatus Lusitanus. *Morbus maculosus. Maculæ nigræ sine febre. Ecchymoses spontaneæ. Land scurvy.*

In the long series of synonyms appertaining to purpura, the terms apyreta, chronica, sine febre, and spontanea, are all intended to point to a distinction between this form of eruption and that which accompanies typhus and some other fevers. This is a purpura dependent on causes not inconsistent with a moderate amount of well-doing, as respects health, on the part of the individual; that is due to the destructive alteration of the blood concomitant with a fever in which the vitality of the blood and of the tissues is seriously compromised. Both are symptomatic of exhausted power and debility, but in a very different degree, and to an extent calling for a considerable difference of management.

The varieties of purpura, distinguished by Willan, are five in number, of which four are generally admitted at the present day; the fifth, *purpura contagiosa*, being the purpura above alluded to, as appearing in connection with typhus and typhoid fevers. The other four varieties are as follows:

Purpura simplex,
" hæmorrhagica,
" urticans,
" senilis.

Purpura simplex denotes the most simple form of petechial scurvy; slighter in its characters and degree than purpura hæmorrhagica, and unaccompanied, like the latter, with hemorrhage from the mucous membranes. Purpura urticans, as I have already remarked, is accompanied with button-like elevations resembling urticaria; and purpura senilis is an affection of the skin of a trivial nature, met with in elderly persons.

PURPURA SIMPLEX.

Porphyra simplex, Mason Good. *Petechial scurvy.*

Purpura simplex is an efflorescence of purple and livid spots on the skin, presenting the forms of stigmata, petechiæ, and vibices; appearing in succession, and displaying at the same moment every grade of development, from the brighter hues of recent extravasation, to the purple and livid hue of a more advanced stage, and the yellow and brown stains of the fading eruption. It is commonly met with pretty equally distributed over the body; but on the trunk, the spots are most abundant on the breast and abdomen, and on the limbs, in the thinner skin of the insides of those members. The eruption is accompanied with tingling, and with a moderate degree of soreness and tenderness of the affected parts of the skin. At its decline the spots gradually fade and disappear, without exfoliation of the epidermis.

The purple spots are sometimes seen in the mucous membrane of the mouth, nose, and fauces, and sometimes on the conjunctiva. But they are less frequently met with on the mucous membrane in purpura simplex, than in purpura hæmorrhagica.

The constitutional symptoms accompanying purpura simplex, are, some degree of languor and lassitude, a feeling of debility, a soreness of the muscles of the limbs; a pale, broad, indented, and sometimes coated tongue; a yellowish and murky discoloration of the skin; bowels sometimes relaxed, and sometimes confined; urine, sometimes scanty and sometimes abundant, sometimes deficient in uric acid salts, sometimes containing them in excess; and more or less œdematous swelling of the legs; in a word, the ordinary symptoms of mal-assimilation and cacochymia. I have a case of this kind before me at the present moment; in the first week of May a gentleman consulted me for erythema attended with pruritus, and complained at the same time of a slight degree of sciatica, and some wandering rheumatic pains in his shoulders and arms. He had also a few blotches about the face, and exhibited symptoms of cachexia, induced by anxious and long-

continued application to his duties. In other respects, he was a man of atonic diathesis, somewhat over temperate, and in the habit of fasting too long. I saw him twice, at intervals of a week, and was disappointed with the slow progress of improvement which he exhibited; and on his third visit at the end of a month, he presented a fine specimen of purpura simplex, with a yellow cachectic countenance, and œdematous lower limbs. The purple spots were numerous and discrete, and chiefly confined to the lower half of the body.

In another case, occurring at about the same time as the preceding, the details were as follows: A merchant, aged forty-two, a single man, of temperate and abstemious habits, had applied himself too closely to the duties of the counting-house for some time, and had suffered in health as a consequence. He was pale, of fair complexion, far from robust or strong, and experienced frequent attacks of dyspepsia, constipation, and rheumatism.

Towards the end of the year 1855, and after two or three weeks of dyspepsia, this gentleman was suddenly seized with rheumatic pains, which came on during the night. The pains were most severe in the axillæ and across the chest and back; and he had pains, also, in one of his hips. This attack was accompanied with rigors; the bowels were constipated, urine scanty and high-colored, with red sediment, but the appetite was not affected. After ten days of suffering, he had administered to him a blue pill, and immediately following the action of the pill, and caused by the pill as he imagined, a crop of petechial spots made their appearance on his legs and arms.

At the time of the appearance of the petechial spots, he suffered from great prostration of strength and depression of spirits, his muscles were sore, and he was unable to walk. After four days, during which fresh petechiæ continued to appear, a crop of vibices suddenly broke out upon the lower limbs; the vibices became the seat of bullæ, which were filled with a purplish fluid; the integument was œdematous; he was unable to stir his legs, and there were scattered over them as many as twenty bullæ at a time. These symptoms continued for six or seven weeks, when the petechiæ and vibices gradually faded, the skin got well, and he seemed to be recovering.

Six weeks after this another attack of rheumatism suddenly took place; he was seized as before with severe pains in the axillæ, extending across his chest and back; the muscles of the back felt as if they had been bruised, and the rheumatic pains seemed to descend from his chest into the joints of his limbs. While in this state, he had administered to him five grains of blue pill on two consecutive nights, and immediately afterwards the purpura returned as before; firstly, as petechiæ, and then as vibices on the legs, covered with bullæ. With the petechiæ and vibices the legs became swollen and hot, the muscles were sore, and he was unable to move them. At the end of a month the symptoms began to subside, and he was sufficiently well to come to London from a distant county to seek my advice.

On the occasion of his visit to me in July, 1856, I found him complaining of languor and lassitude; his tongue was pale, there were no petechiæ in the mouth, no sponginess of gums, or bleeding from any

internal organ; his appetite was moderately good; and his bowels, usually costive, were regular. He made an average quantity of water, which deposited a red sediment; his pulse was weak, unequal, 126 in the minute, and he complained of occasional palpitations of the heart. His joints were still tender and somewhat swollen, and there were scattered over his arms and legs a plentiful sprinkling of petechiæ; on the legs there were vibices as well as petechia, but the bullæ were dried up, and the cuticle was in a state of exfoliation. He remarked that he could always foretell an eruption of petechiæ by an increase of pain in his joints; and, at these times, the slightest pressure on the skin would produce a bruise. The eruption itself gave rise to a little tingling, amounting, when the vibices were numerous, to some degree of pain, but not sufficient to cause anything more than a trifling inconvenience.

This case is interesting, as showing the alliance between rheumatism with the lithic diathesis, and purpura, and this association points at once to the indications which we should follow in our treatment. I prescribed for him the tincture of gentian, with nitro-muriatic acid as a tonic; and the guaiacum powder with bicarbonate of potash as an aperient; with a generous but moderate diet.

One of my friends, of gouty diathesis, and subject to occasional attacks of lichen and eczema of the legs, has not unfrequently, in combination with this eruption, a pretty extensive development of purpura both of the simple and urticating kind. The deep-seated soreness and bruised feeling of the limbs, extending deeply into the muscles, is very remarkable; as is also the stinging and prickling sensation in the skin, wherever the buttons of urticaria are developed. The neurotic nature of the disease is evinced by these symptoms; and to an exhausted condition of nervous tone, may also in all probability be attributed the altered plasma of the blood, and the non-retentive power of the capillaries and small bloodvessels.

PURPURA HÆMORRHAGICA.

Porphyra hæmorrhagica; Porphyra nautica, Mason Good. *Land and sea-scurvy.*

Purpura hæmorrhagica is an aggravated form of purpura simplex, aggravated both in local and constitutional symptoms. The petechiæ and vibices are more numerous, and the ecchymoses more frequent and extensive; sometimes there are, besides, large vesicles or bullæ containing blood. The mucous membranes are affected in a similar way with the skin; the gums are spongy, and bleed; and petechial extravasations have been met with in every tissue of the body, even on the brain and beneath the inner coat of the arteries and veins. The susceptibility to extravasation of blood is so great, that pressure, however slight, produces ecchymosis, and the folds of the skin are marked by an appearance of purple and livid stripes. In the mucous membrane, hemorrhages to a greater or less extent are not uncommon; and it is this character which has given the specific name to the present form of purpura.

The constitutional symptoms of purpura hemorrhagica are a repetition of those of purpura simplex, but in a more severe degree; there is more languor, lassitude, prostration, and muscular debility. The pulse is feeble and quick; there is more or less depression of the moral powers, and fever of the hectic kind. The frequent recurrence of internal hemorrhages increases the debility and hectic feverishness; there is great faintness; the limbs become œdematous; and the patient sinks from exhaustion, sometimes dying suddenly during the continuance of a hemorrhage, or from the effusion taking place in a vital part.

The stigmata, petechiæ, vibices, and ecchymomata, present all the varieties and phenomena which have been noted in connection with purpura simplex, but in a heightened degree. They commence on the lower extremities, and extend by degrees to the trunk of the body, the hands and face being usually free.

The duration of this disease, like its predecessor, is uncertain; it sometimes lasts for months, and has been known to continue for years.

It is this disease which at one time was so common in our navy, and was described under the name of scorbutus (purpura nautica), and which is found to prevail from time to time among masses of people congregated in unhealthy localities, and subjected to vicissitudes of temperature, particularly a cold and damp atmosphere, with bad and insufficient food, imperfect ventilation, exhausting fatigue, or deficient exercise, or a too prolonged use of salt provisions, and which is so effectually remedied and prevented by the reverse of these conditions; namely, a dry atmosphere, good ventilation, good, fresh, and sufficient food, and proper exercise and cleanliness. The general symptoms of sea-scurvy are exactly similar to those described under the head of land-scurvy and purpura hemorrhagica, but often assume an exaggerated character. There is more physical prostration, the skin is pale and discolored, the vibices are larger, the gums more spongy and bleeding, the breath very offensive, the excretions both from the bladder and bowels fetid, the pulse weak and feeble, syncope frequent, hemorrhages more copious and general, and death a more common finale of the disorder. On the other hand, it has been observed in sea-scurvy that the physical depression is greater than that of the mind, that the latter is bright and vigorous to the last, and that the body dies suddenly from efforts made in obedience to the command of the will.

PURPURA URTICANS.

This form of purpura commences with round elevations of a whitish or pale color, sometimes reddish, which resemble the rounded wheals of nettle-rash; but there is generally less irritation and pruritus, and the wheals are less evanescent. When of a reddish hue, they have seemed to me to belong rather to erythema tuberosum than to urticaria; they are somewhat elevated, generally well-defined, and soon become purple and livid, after which they subside slowly, leaving behind them brownish yellow stains; as they are successive

in eruption, they may be seen in all their stages at the same moment. They occur, for the most part, on the lower limbs, and are commonly attended with some degree of œdema. I have seen purpura urticans most frequently in female servants, in whom it has been associated with uterine disturbance; in similar cases, in fact, to those in which erythema tuberosum is apt to be found; and I have also seen it associated with lichen and eczema.

PURPURA SENILIS.

The form of purpura described under this name by Bateman is not very infrequent in elderly women, particularly in those whose arms have been much exposed to local irritants of different kinds, such as the sun's rays, water, &c., and is always to be met with in our workhouses. It is associated with a preternatural degree of thinness of the integument, which is embrowned, yellowish, and mottled, being sometimes smooth and sometimes rigid and wrinkled. Bateman describes it so well that I quote his words: "It appears principally along the outside of the forearm in successive dark purple blotches of an irregular form and various magnitude. Each of these continues from a week to ten or twelve days, when the extravasated blood is absorbed. A constant series of these ecchymoses had appeared in one case during ten years, and in others for a shorter period, but in all, the skin of the arm was left of a brown color." The general health is in nowise affected in these cases, and the patient suffers no inconvenience beyond that of the unsightly appearance of the blotches.

Diagnosis.—The purple and livid color of the spots; the blood being not in the vessels, but extravasated in the tissue of the skin; the persistence of the spots under pressure with the finger: these are the distinguishing signs of purpura. The purple and discolored stains which follow some forms of roseola, and the purple pimples of lichen lividus, are distinguished by their connection with a distinct roseolous eruption on the one hand, and a papulous eruption on the other.

Cause.—The cause of purpura is cachexia resulting from mal-assimilation: the mal-assimilation being one while the effect of generally depressing causes, whether physical or mental; another while, the effect of improper or insufficient food, malarious atmosphere, excessive fatigue, defective ventilation, neglect of exercise and habits of cleanliness; or, again, it may be the consequence of some organic disease, of local weakening of the tissues, as in anasarca, or of general and local weakening, as in old age. The severity or violence of the cause may be very different in different constitutions; in some, purpura is easily induced, and the affection is unimportant; in others, the system of the individual only yields when overpowered, and the disease is therefore grave. In the first of the cases which I have detailed under the head of purpura simplex, the mal-assimilation was induced by fatigue, abstinence, and some degree of mental anxiety, perhaps aided by some unknown miasma, proceeding either from the

neighborhood of the residence of the patient, or from imperfect drainage in his own house. The mal-assimilation first evinced itself as a neuralgia; then as an erythematous eruption; then boils appeared; and lastly, purpura with œdema of the lower limbs; the skin of the face during the whole progress of the morbid phenomena being yellow and discolored. In the second case the cause was somewhat similar.

PROGNOSIS.—Purpura may be trifling or serious, according to the nature of the cause, the constitution of the individual, and the violence of the disease. Purpura simplex is very unimportant; but purpura hæmorrhagica is always serious, in consequence of its complication with internal hemorrhage, which may take place in a vital organ, as in the lungs, and prove suddenly fatal.

TREATMENT.—The treatment of purpura offers no indication different from those for the treatment of cutaneous eruptions in general. We must *eliminate*, we must *restore power*, and we must remove the patient if possible out of the reach of the predisposing cause. For elimination, our remedies are saline aperients and effervescent salines; sometimes we may think it desirable to begin with a dose of calomel or blue pill, to remove any irritant matters or secretions that may be present in the alimentary canal or in the ducts of the liver, or to induce a more healthy action of the liver and kidneys, or we may prefer rhubarb or guaiacum; sometimes we may conjoin a tonic with an aperient, as in the infusion of roses with sulphate of magnesia and quinine; or, having done as much by way of elimination as we think desirable, we must endeavor to restore power, assimilative and vital, through the agency of our bitters and acids, bark and sulphuric acid; gentian or calumba, or hop, with the nitro-muriatic acid, &c. Sometimes in the presence of a lithic acid or gouty diathesis, the bitters, with mild aperient alkalies, such as the sulphate or phosphate of soda, or sulphate of potash, together with the iodide of potash, will do good service. We shall also derive benefit, in some cases, from the combination of the salts of iron with our other tonics, such as the hydrochlorate, the acetate, and the citrate of iron, with quinine.

To the physical medicine must be added a moral medicine; a rest from those exertions which have acted as a predisposing cause of the disease, change of air and scene, and particularly a sojourn for a time by the sea, together with tranquillity of mind.

The diet should be moderate in quantity, but generous; and less abundant and stimulating during the febrile period than subsequently. Meat is one of the most wholesome as it is the most easy of digestion of all our articles of food; it will afford the best materials of supply while the old and morbid elements are being removed by the eliminative process, and it will invigorate the blood and the entire organism. To meat may be added wine, or in some instances beer, as the physician shall see fit.

Local treatment is rarely necessary, but if there existed any uneasiness of surface, which it might be desirable to relieve, the lotion of liquor ammoniæ acetatis, diluted with one half of rose-water, or an

emulsion of bitter almonds, will be found the most suitable for the purpose.

In the sea-scurvy, lemon-juice and potatoes have obtained a deserved reputation, together with fresh meat and water, malt and spruce beer, and wholesome hygienic conditions.

CHAPTER XII.

DISEASES ARISING FROM SPECIAL EXTERNAL CAUSES.

THE special external causes capable of affecting the skin, and giving rise to irritation and inflammation, are three in number, namely, parasitic animals living in, upon, or under the skin; heat; and cold. Of the parasitic animals, the chief are, the acarus, the pediculus, the pulex, the cimex, and the filaria medinensis. The acarus scabiei lives within the skin, burrowing and depositing its ova in the epidermis, and drawing its sustenance from the juices of the true skin. The acarus autumnalis, or harvest bug, only makes a temporary sojourn on the skin, for the purpose of supplying its wants, and is merely a temporary infliction; the pediculus also resides upon the skin, clinging to its surface, pediculus corporis; or to the hairs, close to their exit from the follicles, pediculus capitis, and pediculus pubis. The pulex and cimex, the flea and the bed-bug, belong rather to the covering of man, than to his proper self, attacking his skin only for the purposes of food. The filaria medinensis is a slender worm, of great length, a native of tropical countries, which forms for itself an abiding place in the subcutaneous cellular tissue, and sometimes gives rise to considerable pain and inflammation of the part infested. As it is occasionally brought to this country, it calls for our attention with the present group. Lastly, the effects of heat and cold, the one causing burns and scalds; the other gelatio or frostbite and chilblains, require no further illustration than that which they obtain under their respective heads.

The diseases originating from these causes, and to be treated of in the present chapter are, therefore, SCABIES, the inflammation of the skin caused by the *acarus scabiei;* MALIS, the evil or disease caused by the presence of parasitic animals on the skin; AMBUSTIO, or burn; and GELATIO, or frostbite, the effect of cold acting destructively on the skin; the latter head also includes that common cause of suffering in the winter season, namely, *pernio*, or *chilblain*.

SCABIES.

Syn. *Itch. Scabies papuliformis; papularis; vesiculosa; vesicularis; lymphatica; pustulans; pustulosa; purulenta; ulcerans; vermicularis; cachectica;* Willan. *Ecpyesis scabies*, Mason Good. *Gale*, Fran. *Kraetze*, Germ.

Scabies[1] is an affection of the skin characterized by scaliness of the epidermis, by vesicles, and in some cases by pustules; to which may be added, excoriations, accidental abrasions, and scratches produced by the nails.[2] It is accompanied with excessive itching, the itching being augmented by warmth, and by the use of stimulating food and drinks.

The above appearances are due to the presence of a minute animalcule, the acarus scabiei, which burrows within the epidermis, and excites irritation in the papillary surface of the derma. The burrowing of this little creature gives rise to the *scaliness* (scabrities) and undermined state of the epidermis. The vesicles, which are few and scattered, bearing no proportion to the number of the acari, and little relation to their seat, present some differences in form and character, resulting from their position. Thus, in the thin epidermis of the lateral surfaces of the fingers they are distinctly conical and acuminated; on the wrists and other parts of the body they are frequently more or less rounded, and resemble the vesicles of eczema; while in the latter situations they are also variable in size. The vesicles differ in reference to their contents; in those of a conical form, the contained fluid is transparent and viscous; in the rounded vesicle the fluid is also transparent, but in some it is more or less opaque and puriform. The pustules are present only in severe cases, or in persons with an extremely sensitive skin, for example, in children; they are generally psydracious, and vary in size, from the small pustule of impetigo, to the larger pustule of ecthyma.

When one of the early vesicles of scabies is examined with attention, a minute spot or streak may be observed upon some one point of its surface. This is the aperture originally made by the insect on its first entrance within the epidermis, and from this spot or streak a whitish fluted line may be traced either in a straight or a curved direction, into the neighboring epidermis. The whitish line is the *cuniculus*, or burrow of the acarus; it necessarily varies in length, being sometimes as much as five or six lines in extent, and at its termination, under a slight elevation of the epidermis, the little inhabitant lies concealed. The acarus may be easily distinguished by the experienced eye, as a small dark crescent, or as a minute white glistening orb, with a dark crescentic edge, at the end of the cuniculus, and if a thin capsule of epidermis be raised in this situation, with the point of a needle, the little creature is brought into view.

The spot or streak which is here described is not met with on all

[1] Quasi *scabrities*.

[2] Portraits of Diseases of the Skin; Plate XVII., AA.; in which a good example of scabies is shown.

the vesicles, for the same animal may excite a series of these in its course; and a number may be developed in the vicinity of its habitation, while in the primitive vesicle alone—that formed by the entrance of the acarus—it is, that the trace of its entrance can be expected. The aperture, again, does not communicate with the interior of the vesicle; it is the too close neighborhood of the little *grubber* that acts as the cause of the formation of the vesicle; the vesicle is consequently a provision of nature to protect the derma from the near approach of the cause of irritation. The acarus scabiei, therefore, is *never* situated within the vesicle or within the pustule, and there is no communication between the vesicle and the cuniculus.

At a later period it is no uncommon thing to find at one extremity of the cuniculus the marginal outline of the base of the vesicle, while at the other end is the little dome under which the acarus is imbedded. The accompanying sketch is intended to illustrate this appearance, the cuniculi (A) being about twice the natural size. The vesicular end of the cuniculus is a mere outline bounded by the broken edge of cuticle which formed the base of the vesicle, the rest of the vesicle having been removed by attrition and desiccation. The next portion of the cuniculus, for about half its length was an open groove with a ragged border, while the remainder of the cuniculus was an arched canal or tubulus, somewhat expanded from point to point, where the animal made its temporary rest in its mole-like progress onwards. In the magnified figure (B) the acarus is seen at the end of the cuniculus; it resembles a white and pearl like glistening globule capped on its anterior border, or that which is nearest the end of the cuniculus, with a reddish brown crescent; the colored crescent being the chytinous investment of the head and anterior legs. Figure C represents the acarus removed from the cuniculus, and its appearance when seen with the naked eye through the thin convex plate of cuticle which covers it as with a watch-glass.

Fig. H.

The eruption of scabies usually makes its first appearance between the fingers; from these it extends more or less quickly to the wrists, flexures of the elbow, axillæ, inner sides of the thighs, and abdomen. In weakly constitutions it may be limited to the hands for a considerable period without extending further, while in severe cases and sanguine constitutions it may speedily spread over the entire body, with the exception of the face, which is very rarely affected.[1] The excessive itching causes persons suffering from this annoyance to scratch, with violence, the seat of the eruption; but the scratching only diffuses the

[1] The only case on record with which I am acquainted, of scabies affecting the face, is one mentioned by Alibert. The subject was an infant, and was supposed to have received the disease from the mammæ of its nurse.

pruritus, and the skin is often severely torn and abraded. When the points of the vesicles are broken, they become covered with small, thin, yellowish scales, and when they are made to bleed, they are occasionally followed by little black scales, like those of prurigo. When, in consequence of superadded irritation from susceptibility of the skin from scratching, from injudicious remedies, or from a plethoric state of the system, the vesicles take on the characters of pustules, the disease assumes the appearance which has been described by Willan under the name of *pustular itch* (scabies purulenta).

The seat of the eruption of scabies is occasionally found to be modified by circumstances. For instance, while, in the generality of cases, the disease is observed between the fingers and on the wrists, in those who, from hard labor or the manipulation of hard substances, have the epidermis of the hands and arms much thickened, it would be sought for in vain on those parts. In tailors and needlewomen the eruption is first developed on the hands; and in infants, Rayer remarks, that the vesicles are first perceived upon the breech.

The activity and extent of scabies are strikingly modified by the state of constitution of the patient, its energy maintaining an exact relation with the vigor of the system. When the person is of sanguine temperament, and robust, the scabies spreads rapidly, and gives rise to insupportable pruritus; when, however, the subject is weakly and infirm, or reduced by the presence of other disease, its progress is slow, the eruption partial, and the pruritus moderate.

Although in cold and temperate climates scabies may be regarded as a mild and unimportant affection as respects the health, producing but little local disease, and no constitutional symptoms, yet in warmer climates, as observed by Dr. Adams[1] in Madeira, it is accompanied with pyrexia, and the local effects are often very severe. The itch-animalcule is very common in the island of Madeira, where it is called *ouçou* or *ouçam*. The following case, illustrative of these remarks, I quote from Dr. Adams's account of these animalcules:[2]

"A patient (a European) applied to me on account of a spreading inflammation, attended with large vesications, collections of serum, in some places of pus, with intolerable itching, sometimes intense pain and smart fever. All these symptoms were much exasperated at a certain period of the day. I treated it like any other inflammatory complaint, with evacuants, and poultices to the part. The latter afforded some relief, but my patient grew extremely impatient from the fever and frequent violent pains, which deprived him of sleep. This induced me to examine the part with more care, and to convince myself that, how great soever the pain might be, the mischief extended only immediately under the cuticle. In the meantime, the female servant, who assisted with the poultices, pronounced the disease *ouçöes*, and to convince him of the truth of her assertion, extracted two from the edges of the sore, which he saw crawling on his nail. This appearance of the disease, so entirely local, and the part affected with such violence, was so different from anything I had met with before, that

[1] On Morbid Poisons. [2] Page 298.

no evidence less than the above would have satisfied me. The pain indeed was less surprising when we consider the disease was immediately on the rete mucosum. Subsequent experience taught me that these symptoms are by no means uncommon. The disease yielded instantly to the usual topical remedy."

DIAGNOSIS.—One of the most important features in the history of scabies is the distinction of the disease from other cutaneous affections; and this not only with reference to the mind of the patient, but also with regard to the management to be adopted. The treatment which is applicable to scabies would be improper in other diseases; while, on the other hand, the means appropriate for the cure of other diseases would leave the itch in full possession of its mischievous activity. The chief diagnostic features of scabies are, *firstly*, a peculiar scaliness and undermined state of the epidermis, which are not met with in other cutaneous affections; *secondly*, its conical vesicles, with acuminated and transparent points; and *thirdly*, and principally, the presence of the acarus, which may be extracted from its retreat beneath the loosened epidermis with the point of any sharp instrument. The diseases with which this disease is apt to be confounded are, eczema, prurigo, lichen, impetigo, and ecthyma.

Eczema is a vesicular disease, and therefore bears some resemblance to one of the characters of scabies, but the vesicles are globular, and scarcely raised above the surface; they are always collected in clusters, and give rise to a sensation of pricking rather than of itching; moreover, eczema is not communicable by contact.

Prurigo is a disease attended with thickening and considerable alteration of the skin, and unaccompanied by vesicles; it occurs on the back and shoulders, and the outer sides of the limbs, where the skin is thickest. The pimples of prurigo are frequently torn by the nails, and surmounted by little black scabs, which are characteristic of prurigo; whereas the scabs which form on the ruptured vesicles of scabies are mere scales, and yellowish in color, a few only being black, when the scratching is carried to the extent of making the vesicles bleed. The pruritus of the two diseases, again, is different; in prurigo it is burning, pricking, and painful, which is not the case in scabies, and, moreover, the disease is not communicable. Prurigo is occasionally met with as a complication of scabies, and in this case the diagnosis requires a nice discrimination.

Lichen simplex, again, is a papular disease without vesicles, the pimples being for the most part thickly disseminated. When lichen occurs on the hands it affects the dorsal surface, and not the interspaces of the fingers; the pruritus accompanying lichen is different from that of scabies, and the disease is not contagious. Lichen sometimes complicates the eruption of scabies.

Scabies can only be mistaken for impetigo and ecthyma when complicated with pustules; however, the limitation of the pustules to the hands or flexures of the joints, and the presence of the scaly epidermis and conical vesicles of itch, will be sufficient to determine the diagnosis.

Another complication of scabies frequently results from the irritation of substances employed in the treatment of the disease; it is an eruption of eczema simplex. I have seen cases wherein the treatment of scabies has been continued for upwards of six months, and the disease, to all appearance, has resisted the remedies employed for its cure. But in these cases the scabies was long since eradicated, and the obstinate eruption which continued was an eczema simplex, induced and perpetuated by the irritating applications used for the cure of the supposed itch. These cases immediately recovered when treatment was laid aside.

CAUSES.—Scabies affects all ages, both sexes, and all ranks of society, but is most frequently seen among the lower classes, in whom personal cleanliness is neglected, and the opportunity of communication consequently greater. When the disease makes its invasion in respectable families, its source may generally be traced to laundresses, servants, and their connections.

Until very recently scabies was hardly known in London, nor probably in England; it had disappeared even from our work-houses, and was rarely met with among nurses and children in private families. But since the return of the army from the Crimea the disorder is revived; it has spread very extensively, and has found its way into a higher class of society than that in which it previously moved. Immediately upon the close of the war, scarcely a day passed without bringing me a case of scabies, chiefly in the person of a military or naval officer; and at present I see several such cases in the course of a week, not however so much among the original introducers of the disorder, as in those to whom it has extended.

The disease is always communicated by contact, either immediately, or through the medium of articles of clothing which have been in the possession of the infected individual. But there are many circumstances predisposing to its influence, such as luxuriant health and vigor, sanguine or lymphatic temperament, the spring or summer season of the year, warm climates, youth, confined atmosphere, want of cleanliness, &c. The period at which the vesicles make their appearance after the invasion of the acarus, presents several important and remarkable modifications, having relation to the state of health and age of the subject, and the season of the year. Thus, in strong and healthy children, the vesicles have been observed at the end of two days after contact, the ordinary period for children being four or five days, while in those that are weakly the period of eruption may be still further postponed. In adults, the ordinary period of incubation is a week or ten days, but in the winter the eruption may not appear for a fortnight or three weeks. Old persons, again, require a still longer time for the development of the vesicles, particularly in the winter season.

The proximate cause of scabies is the acarus scabiei,[1] which is transferred by the infected to those who are sound, by actual contact.

[1] The history of this animalcule will be found recorded in a separate chapter at the conclusion of the volume.

In some instances it may be conveyed to the sound person in the adult state; while in others, ova, or embryos suspended in the fluid of the vesicles, may be the mode of transmission. Certain it is, that the application of one of these animalcules to the skin of a sound person will give rise to the disease.

Some interesting and conclusive experiments on the habits of the animalcule were made, on the revival of the acarus scabiei in France, by M. Albin Gras, a pupil at Saint Louis, and published by that gentleman in the year 1834.

Exp. 1.—"On the twenty-eighth of August," writes M. Gras, "in the presence of several physicians and students, I placed two living acari on the middle and anterior part of my fore-arm, and covered them with a watch-glass kept in its place by a bandage. On removing the apparatus on the thirtieth, we found two superficial cuniculi (sillons) half a line in length, and at their extremity two little white points,[1] indicating the presence of the acari. Substituting a fold of linen, retained in its place by a piece of adhesive plaster, for the watch-glass, the acari were left undisturbed for six days longer. At the end of this time the white points were no longer perceptible, and the cuniculi having become obliterated, had disappeared."

Exp. 2.—"On the first of September I placed seven living acari on my fore-arm, and covered them with a fold of linen, and piece of diachylon plaster. Four days after we found four or five well-marked cuniculi. On the sixth of September two of the acari being extracted from their cuniculi, were found active; they were then replaced. On the twelfth another animalcule was removed and examined; it was quite lively. On the fourteenth there was considerable itching, with the development of a vesicle; the cuniculi were two lines long. On the sixteenth there were *several new vesicles near the cuniculi, but not on their line.* On the seventeenth the vesicles of the previous day had been rubbed off by the linen, but two or three new ones were visible. On the following day I put an end to the experiment, by rubbing some sulphuro-alkaline ointment into the part. During the course of the experiment I suffered pruritus from time to time."

Exp. 3.—"On the ninth of the month I imprisoned six acari on my ring finger, by means of the finger of a glove. Next day there were two cuniculi half a line long. The acarus of one of these burrows was apparent for ten days, the other for three weeks, but after this period they both disappeared. During this interval I cauterized several suspicious vesicles developed on the same finger, and discovered two new cuniculi originating in acari that had fixed themselves without having been observed. None of the vesicles appeared on the line of the cuniculi."

Exp. 4.—"I lately placed nine acari in the bend of my left arm, and retained them there by a compress and bandage. Four hours after I felt pruritus, and next day perceived four cuniculi. Several days after, some vesicles showed themselves on my fore-arm."

[1] The dark brown crescentic speck produced by the color of the head and anterior legs, is certainly more striking as a diagnostic character than the white body of the animal here referred to; both, however, should be taken in conjunction.

Exp. 5.—"Having placed two acari in the flexure of the elbow of two persons, who expressed their willingness to submit to my experiments; on one, three or four vesicles were apparent on the fifth day, and were accompanied by severe itching. On the other there were two cuniculi, with pruritus, but no vesicles."

Scabies is not limited to man; it is not unfrequently seen in animals, and by them may sometimes be communicated to man. During the spring of 1840, I had the opportunity of seeing and treating a case so communicated, in the person of a veterinary surgeon, who had received the contagion from an ass upon which he was performing a physiological experiment.

Prognosis.—Scabies is a mild disease, and little affective of the strength of the system. Some few cases have been recorded in which the eruption has subsided during an acute disease, to reappear as soon as that disease had become somewhat mitigated. Instances have also been advanced with a view to prove that certain serious visceral disorders have occasionally been developed, upon the sudden retrocession of scabies. These statements are not borne out by observation, and refer to a period when scabies was the generic epithet for every disease of the skin attended with itching; but there is good reason for belief that a brisk attack of itch would rather be useful than otherwise, as a counter-irritant.

Treatment.—The treatment of scabies is purely local, and numerous therapeutic remedies have been employed from time to time for its cure; moreover, as the object to be attained is simply the extermination of the acarus, many have been successful. Several of these medicines act by means of their stimulating powers, and at the same time that they destroy the parasite, excite considerable irritation in the skin. Others, again, effect this object without causing irritation, or they give rise to much less inconvenience. In selecting our measures of treatment, therefore, our attention should be directed to the employment of remedies which will act with certainty, and will produce the least possible degree of excitement in the cutaneous surface. Such a remedy is presented to us in sulphur, which may be regarded as specific in the treatment of scabies. To effect the cure the sulphur is rubbed into the skin, and is conveyed by imbibition into the texture of the epidermis. Here it probably combines with hydrogen, and sulphuretted hydrogen gas is evolved, which acts as a deadly poison on the acarus, and destroys its ova. In some instances the sulphuretted hydrogen gas in solution is employed as a wash or bath, and answers the purpose perfectly, but is longer in effecting a cure than the sulphur, probably on account of the gradual and constant generation of the gas in the tissue of the epidermis, in the latter case. The sulphuretted hydrogen lotion gives rise to less irritation than the sulphur ointment, and is therefore a preferable mode of treatment in children, and persons with a delicate skin. Before either of these or any other remedies are employed, however, it is desirable to prepare the skin for their reception by a thorough ablution with a warm solution of subcarbonate of potash, containing about half a pound of alkaline salt to a gallon of water.

To effect the cure of scabies in the shortest possible time, the best preparation of sulphur is the simple sulphur ointment, of which, in the adult, four ounces should be well rubbed into the entire skin, and particularly into the affected portions, morning and evening, for two days. It is desirable also, that the patient should wear a flannel shirt, and retain the same during the whole treatment. When this covering is not sufficiently large to envelop the entire body, he should also lie between blankets. On the morning of the third day the patient should take a warm bath, and wash the skin thoroughly with plenty of soap, when the cure will, generally, be found to be effected. Much, however, depends upon the manner in which the alkaline ablution and the friction of the affected parts shall have been performed. In some cases it may be desirable, as a matter of precaution, to continue the inunction for a third day, or to use the white precipitate ointment[1] to the affected parts for a week or ten days, in case any ova may have escaped the influence of the sulphur treatment. In children one-half of the above quantity of ointment will be found sufficient. This method, while it offers the advantage of a rapid cure, is liable to the inconvenience of producing accidental eruptions. I am in the habit of combining with this plan the internal administration of sulphur, in doses of a scruple or half a drachm, with a scruple of bitartrate of potash three times a day. And this I should recommend to be done, when the cure by inunction of lard or chamomile ointment is preferred.

Reflecting on the *rationale* of the treatment of scabies by sulphur, we are led to the conclusion that the object to be attained is the thorough impregnation of the skin with the vapor of sulphur; and then the question arises, whether this end is to be attained in any other way than that above described? In hospital practice, and in the case of children, it may be easy enough to saturate the skin with the sulphur ointment, and keep the patient within blankets to concentrate the sulphureous vapor on the skin; but this plan is highly inconvenient, and often impossible, to persons engaged in occupations which require daily attention, let alone the annoyance that a man in perfect health must feel at being buried in blankets for a couple of days. Appreciating this difficulty, I have, for some years past, had recourse to a very simple method which I have found to answer the purpose completely, and which has the advantage of demanding no confinement and none of the heroic rubbings-in above described. My plan is to require the patient to rub into his hands, and particularly into the wrists and between the fingers a little sulphur ointment. This he repeats several times a day; for example, every time he washes his hands, and again at bedtime; the latter rubbing being a more thorough one than the rest. Moreover, at bedtime he further rubs the ointment into any other part of the body where the eruption may

[1] ℞.—Ung. hydrarg. ammonio-chloridi, ℥j.
Moschi, gr. ij.
Olei lavandulæ, ♏ij.
Olei amygdalarum, ℥j.—M.

exist. Then, besides the outward application, he takes from ten to thirty grains of the sulphur sublimatum twice or three times a day. In this way we secure a perpetual atmosphere of sulphur, and a thorough saturation of the skin, both from within and without, an amount of saturation, in fact, which no acarus can resist. The quantity of sulphur ointment required is small, and such as may be allowed to remain on the skin and between the fingers without detection by an indifferent person, and yet sufficient to answer all the purpose. This method of treatment destroys the acarus in the clothes as well as in the skin of the patient; and with the slight exception of giving him the smell of a brimstone match, a smell which he may cover with any kind of perfume, it is unattended with the least inconvenience. A week of this treatment, followed by a second or third week of a modified plan, for example, merely using dry sulphur-powder to the hands, instead of the ointment, and continuing the sulphur internally, will effectually cure the disease; and during its progress the patient may take a tepid or warm soap-bath every third day. To protect the clothes not in use, shutting them up in a drawer, with some sulphur-powder sprinkled between them, will be found sufficient, and I also recommend the sprinkling of sulphur within the bed.

The sulphuretted hydrogen treatment consists in bathing the surface of the body in a solution or bath of sulphuret of potash, containing one or two ounces of the salt to a pint of tepid water; or in sponging the skin with a mixture of two ounces of each of the following solutions in half a pint of tepid water, many times in the course of the day:

℞.—Sulphureti potassæ, ℥ij.
Aquæ, Oj.
M. ft. solutio.

℞.—Acidi muriatici, ℥j.
Aquæ, Oj.
M. ft. solutio.

The former of these methods is well adapted for young children, but the latter frequently creates considerable irritation, and produces accidental eruptions. The duration of treatment is a week or ten days.

Numerous other preparations, sulphureous and non-sulphureous, and each possessing, according to their advocates, peculiar advantages, have been recommended by different authors. Among the more deserving of these remedies are the following:

Saponaceous Compounds.

℞.—Potassæ subcarbonatis, ℥ij.
Aquæ, ℥j.
Olei olivarum, ℥ss.
Camphoræ gummi, ℥ij.
Sulphuris sublimati, ℥v.—M.

℞.—Sulphuris sublimati,
Saponis alb., āā ℔ss.—M.

The saponaceous compounds possess the advantage of not soiling the habiliments of the patient, but they require a longer use than the sulphur remedies, namely, two or three weeks.

Pyhorel recommends the friction of half a drachm of sulphuret of lime with sweet oil into the palms of the hands without any application to the surface of the body, the treatment being continued for

fifteen or twenty days. Fantonetti advocated the use of chloride of lime; and Delpech the employment of frictions of sweet oil alone. This last remedy would, doubtless, act most destructively upon the acarus, could the oil reach the animalcule. In my own practice I have found sweet oil, containing a little camphor, very successful in infants whose skin was too tender to bear sulphur ointment. And, carrying out the idea of the oily matter bearing a considerable share in the curative agency of the sulphur remedies, I have also employed inunction with lard alone with a satisfactory result. The lard requires to be well rubbed into all parts of the body, particularly into those chiefly affected, night and morning, and by the end of a week the cure is complete. A warm soap-bath should then be taken to purify the skin. Mr. Stiff, in a communication made to the *Medical Times*, in 1845, is an advocate for this plan; and M. Bazin, in some trials lately made at St. Louis, states that six frictions with oil or lard are all that are requisite for the cure of scabies.

M. Bazin, however, prefers an ointment of chamomile to the simple lard, and he states, as its advantages, that it cures in three frictions; that it relieves the itching instantly; and that it gives rise to no secondary eruptions, as is the case with the sulphur and sulpho-alkaline treatment. His formula for making the ointment is to mingle equal parts of fresh chamomile flowers, olive-oil, and lard, and heat them together on a sand-bath. It appears to me that the same purpose would be gained by adding the essential oil of chamomile to lard.

Among the simples recommended from time to time by different physicians, or employed popularly, are solution of tobacco, used by Boerhaave, but liable to many objections; stavesacre, hellebore, scabious, sweet-scented rush, elecampane, and onions.

The use of stavesacre and hellebore have lately been revived, and, according to their respective suggestors, with flattering success. M. Bourguignon recommends that the patients should begin their treatment as usual, by taking a soap-bath; that, after the bath, the stavesacre ointment should be well rubbed into the whole body, particularly into the parts chiefly affected; and that the inunction should be repeated four times a day. On the fourth day the cure is complete, and another soap-bath should be taken. M. Bourguignon's formula for the ointment is twelve ounces of powder of the seeds of stavesacre to be stirred into twenty ounces of boiling lard, and macerated in a sand-bath for twenty-four hours. It may then be strained, and some essences added to give it a pleasant odor.

The formula proposed for the hellebore is, to mix together eight ounces of powder of white hellebore with four ounces of soft soap, and sufficient hot water to bring it to a consistence fitted for friction on the skin. It should be used once a day until all itching ceases, and then washed away in a warm bath. After a few frictions it produces a feeling of heat in the skin.

Especial care should be taken that the whole of the garments worn by the patient, and the bedclothes in which he has lain, should be

disinfected by exposure to sulphureous acid gas. This is a measure of great importance, since the acari and their ova remain attached to all articles of apparel, and are easily communicated by them. Indeed, whenever practicable, the infected clothing should be destroyed. To complete the eradication of the animalcules, perfumes should be worn in the dress for several weeks.

The treatment of scabies has been enriched by the observations of M. Albin Gras, in the work before alluded to. He observes:

"I was enabled to obtain living acari from a patient who had taken two or three sulphur baths, containing four ounces of sulphuret of potass to the bath. On the contrary, I have frequently found them all dead after a single friction with the sulphuro-alkaline ointment." "But, although the insects are dead, vesicles still continue to appear for several days."

"Immersed in pure water the acarus was alive after three hours; in saline water it moved feebly at the end of three hours; in Goulard solution it moved after an hour; in olive-oil, almond-oil, and castor-oil, it survived more than two hours. In croton oil it was living after the lapse of an hour, but dead at the end of four; in lime-water it was dead in three-quarters of an hour; in vinegar in twenty minutes; in alcohol also in twenty minutes; but in naphthaline still more quickly; in a solution of sulphuret of potass it was dead in twelve minutes; in spirit of turpentine in nine minutes; in a concentrated solution of hydriodate of potass the acarus ceased to exist in from four to six minutes; in a solution of arsenious acid it was dead in four minutes; in sulphuric acid, diluted with three parts water, it died in three minutes; in pure creasote, and in concentrated acids and alkalies, its death was immediate. Placed over night on powdered sulphur, the animalcule was found dead the next day; and it required to be exposed to the vapor of burning sulphur for sixteen minutes before it died."

One of the most remarkable of the phenomena of scabies, is the localization of the acarus to the hands; while the eruption excited by it may be spread more or less extensively over the entire body. The animal is the excitant, and the excitation of the sensory nerves of the skin of the hands is communicated to the whole of the nervous apparatus of the skin, hence the itching and eruption on parts of the skin which the acarus never reaches. Hence, also, the principle of cure, to remove the local irritation, and thereby to subdue the excito-sensory phenomena which take their rise in the local irritation. But the morbid sensibility of the skin induced by the acarus, is often aggravated by the occurrence of the disorder in a person of eczematous diathesis; in which case the eczema, in some one of its forms, becomes established and permanent, and requires the treatment of eczema for its removal. In such a constitution the acarus merely takes the place of a more common cause of the complaint, and the disease which ensues is not to be regarded as scabies, but in its true character as eczema or lichen, as the case may be. The treatment also must be that which is suitable for eczema, without reference to the scabies, which must be treated locally by the usual means; or, as the eczema

is secondary in its development, the scabies may be cured first, and then the eczema may be attacked. After the first week of treatment specifically directed to the removal of scabies, the case must no longer be confounded with scabies; the medical man must not yield to the belief that he has to do with an instance of unmanageable scabies; and the patient must not be permitted to carry away the impression that his medical adviser is unable to cure the scabies. But to effect the cure the removal of the primary cause is essential. No treatment, however well directed, will benefit the eczema until the acarus is destroyed; and when the acarus is effectually destroyed, as may be ascertained by the disappearance of all irritation about the hands and wrists, the treatment should be continued as for an ordinary and uncomplicated example of eczematous eruption.

From these experiments we may infer, that sponging with vinegar would be a good practice, and one sufficiently harmless to be adopted in the case of the youngest children.

MALIS.

Die Insektengeschwulstesucht.

The term malis, the μάλις and μαλιασμὸς of the Greeks, is used as a generic term to signify the presence of parasitic animals on, in, and under the skin, and may be made to include the bites and stings of insects. The animals which are commonly found to draw their nourishment from the human skin are the acarus scabiei, acarus autumnalis, pediculus, pulex, cimex lectuarius, and filaria medinensis. The effects of the acarus scabiei, constituting the disease scabies, have been already examined; there remain, therefore, to be considered, the nature of the suffering occasioned by the acarus autumnalis, and the remaining parasites. This will be discussed under the five following heads, namely, malis acari, malis pediculi, malis pulicis, malis cimicis, and malis filariæ.

MALIS ACARI.

Crinones. Die Mitesser.

The acarus, or mite, is very abundantly dispersed throughout nature, existing apparently wherever nourishment is to be found, and representing among terrestrial and air-breathing animals, the infusoria of the aqueous world. Acari are well known to inhabit vegetable substances, such as meal, dried fruits, sugar, &c., and to be the cause of their decay and destruction; in like manner, it is found among animal substances, as cheese, dried meats, and fish, &c., gradually converting the nutritious parts to its own purpose, and leaving behind only that which is innutritious or resists its powers of disintegration. The surface of other animals, again, is a region in which animal matters of various kinds are to be met with, either in the form of excretions from the skin, or the juices of the skin itself; hence it is, that in this region we find the acarus revelling in abundance, sheltered among the lower animals by their hairy coverings, and provided with

means of fixing upon and burrowing into the smooth and uncovered skin of man.

To the observers of nature, the large acarus which takes up its quarters on the under side of the common dung-beetle is well known. This creature probably takes advantage of the habits of the beetle to enjoy with him the feast which he laboriously buries in the ground. The acarus casei, or cheese-mite, is also familiar to all; but besides these common examples of the acarus, I have discovered it on the skin of the pheasant, in the mouse, and in the horse; in the latter constituting the cutaneous disease termed the *mange*.[1] From these observations it may be inferred that every animal has its acarus; and, judging from the great variety of form which the few examples I have had the opportunity of observing have presented, I should be ready to conclude that each genus or even species of animal had its peculiar acarus, modified in its configuration and structure to suit the special circumstances by which it may happen to be surrounded. Thus the meal-mite and the cheese-mite, imbedded in their food, require no special prehensile organs, and are chiefly remarkable for the bush of hairs which spring from their bodies to keep off the particles of their food and protect them from pressure and suffocation. The acarus scabiei is especially constructed for burrowing in the substance of the epidermis; he is furnished with a coat of plate and four strong arms in front, spines set backwards on his body, and four small weak legs behind. The acarus equi, much larger than the acarus scabiei, is also organized for burrowing: as in him, the legs are set forwards and backwards, the former being strong, the latter weak; and he is additionally provided with a pair of strong perforating organs, constituting a haustellum, the sides of the haustellum being furnished with recurved lateral hooks. Both the acarus scabiei and acarus equi have suckers attached to their feet; but the acarus autumnalis, being only an occasional parasite, and not organized for habitation in or on the skin, is only supplied with hooks to grapple with the surface while he is taking in his supply of food.

The acarus scabiei and acarus autumnalis are the only two acari at present known which attack the human skin, at least in this country; but it is not impossible that in other countries and climates other parasites of the genus acarus may be met with. In illustration of this suggestion, I may mention that some specimens of acari were sent me, a few years since, from the United States of America, by Dr. Hanbury Smith, with an account of the circumstances under which they were obtained. They were found on a lady residing in Stockholm. She was for a long time teased with them, and they gave rise to much inconvenience and vexation. The Stockholm acarus is of large size, $\frac{1}{28}$th of an inch in length, by $\frac{1}{40}$th of an inch in breadth; consequently somewhat more than three times the size of the acarus scabiei and acarus autumnalis. It is oval in form, and furnished with eight legs,

[1] The acarus equi will be found described by me in the Transactions of the Veterinary Medical Association for 1843–4, page 399. Some figures drawn with the camera lucida accompany the description of the animal.

two of which are set forward and six laterally; therefore the creature is not organized for burrowing. The legs are long, seven-jointed, and

Fig. I.

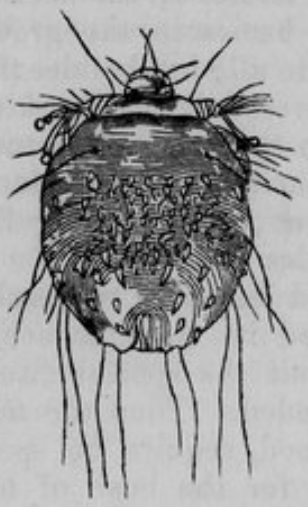


Fig. L.

Fig. M.

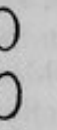


Fig. K.

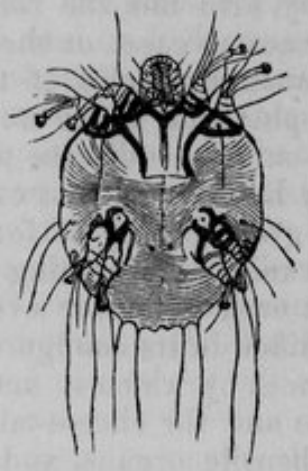
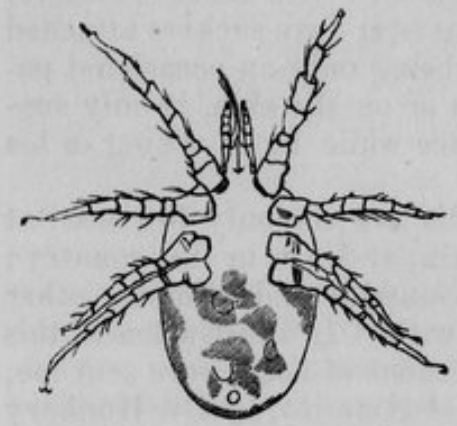


Fig. I.—The itch animalcule, acarus scabiei, viewed upon the back; showing its figure and the arrangement of its spines and filaments.
Fig. K.—The itch animalcule, viewed upon the under surface, showing its legs and lobulated feet.
Fig. L.—The foot and last joints of the leg of the itch animalcule.
Fig. M.—Ova of the itch animalcule.

armed with a double tarsal hook, which would enable the animal to adhere firmly to the skin; its head is supplied with maxillæ and palpi, or rather chelæ, which are five-jointed; and from between the chelæ is projected a long, lancet-shaped haustellum. Judging from the organization of this acarus, I should conclude that its presence on the skin of man was the result of accident, that it drew its subsistence habitually from some other source, but that it was quite capable of piercing the cuticle, and obtaining its food from the juices of the human body, and in this way giving rise to considerable irritation. Probably it is to this species of acarus that Rayer refers when he observes that "symptoms similar to those produced by pediculi, may be occasioned by *acarides*, an insect very closely allied to the *ixodes*, but capable, according to Bory St. Vincent, of forming a new class, characterized by a small sucker, accompanied with two feelers, consisting of four joints. M. Bory St. Vincent has observed these insects upon a woman of about forty years of age, who, after having experienced violent itchiness over the whole body, was very much astonished to see thousands of acarides on all the parts which she had scratched."

Fig. N.



The Stockholm acarus, viewed on its under surface, and magnified 38 diameters.

ACARUS AUTUMNALIS.

Harvest-bug. Mower's Mite. Wheal-worm. Rouget.

The acarus autumnalis is scarcely larger than the acarus scabiei, measuring, in average numbers, about $\frac{1}{100}$th of an inch in length, by the $\frac{1}{150}$th of an inch in breadth; the average size of the acarus scabiei being $\frac{1}{100}$th of an inch in length, by $\frac{1}{140}$th of an inch in breadth; consequently the acarus autumnalis is narrower than the acarus scabiei, and flattened instead of being globular. It is of a reddish color, and provided with six legs and two chelæ. The chelæ are four-jointed, scarcely reach beyond the level of the maxillæ, and are furnished at the extremity with strong nippers. The six legs spring from the thorax, are long, seven-jointed, and terminated by a short tarsus, with a pair of ample recurved hooks. The haustellum is concealed.

Fig. O.

The acarus autumnalis, viewed on its under surface, and magnified 70 diameters.

The acarus autumnalis is most troublesome in the autumn season, and commonly during harvest, and is met with most abundantly on a chalky soil. It makes its attack chiefly on the legs of those who venture into the fields during the harvest season, and from the legs finds its way to every part of the body, causing more or less irritation according to the susceptibility of the individual. Its bite is followed by redness and some degree of swelling, the amount of both depending more upon the cutaneous sensibility of the person than upon the real injury done to the skin; sometimes the bite is followed by a small, glossy, red blotch, white, and raised in the centre, like a wheal of urticaria, hence one of the names of the little animal, *wheal-worm;* at other times the inflammatory congestion is as large as a crown-piece; or, when the bites have been numerous, a broad expanse of erythema may be the consequence. If the inflamed spot be examined with care, a small red point will be observed in the centre, this is the acarus; and it requires some dexterity on account of its adhesiveness to remove it from the skin. The irritation caused by this little creature, always troublesome, is, in some persons, so severe, as to amount for the time to a kind of torture.

The best remedies for the bite of the harvest-bug, to destroy the animal and subdue the irritation are, spirits of wine, a lotion of ammonia, containing a drachm of the sesquicarbonate to eight ounces of elder-flower water; a lotion of equal parts of sal-volatile and distilled water, the liquor ammoniæ acetatis, distilled vinegar, the elder-flower ointment, or an ointment consisting of simple cerate with camphor.

MALIS PEDICULI.

Morbus pedicularis. Phthiriasis. Die Laussucht.

Three kinds of pediculi infest the human body, the pediculus capitis, pediculus corporis, and pediculus pubis. The pediculus capitis is

found chiefly in children, but is not absent in the adult; the pediculus corporis is met with principally in the adult and elderly persons; and the pediculus pubis is more common in the adult than in the young.

The PEDICULUS CAPITIS is protected from injury by the hair, and deposits its ova, commonly called nits, on the stems of the hairs; and the itching which it creates is said to be referable more to the movements of the animal on the skin than to the sting with which it is supposed to be armed; they are named pediculi, says Isidore, "quod magis pedum motu lædant, quam morsu." They are remarkable for the rapidity with which they multiply, and some of the phenomena to which their presence gives rise may be attributed to this circumstance. Leuwenhoeck put their power of procreation to the test of experiment; he "took two females and placed them in a black silk stocking which he wore day and night, that they might have the full benefit of feeding upon him. He found that in six days each laid fifty eggs without exhausting its store, and that in twenty-four days the young were capable of laying eggs themselves; and carrying on the calculation, he estimates that the two females conjointly might produce eighteen thousand in two months."

The PEDICULUS CORPORIS is larger than the pediculus capitis, it is also whiter and flatter, and its ova are agglomerated and deposited among the body-clothes of the person. Just as the pediculus capitis never deserts the head, the pediculus corporis is rarely found among the hair, preferring the smooth parts of the body, to which it adheres closely. It is commonly met with in prisons and workhouses, and in those abodes of the poor where cleanliness and nastiness meet; less frequently in hovels, where the mingled odors of cooking, smoking, and match-making are diffused through the atmosphere. Pediculi have deliçate noses, and are easily affronted by unseemly smells.

Pediculi, like all other animals, are strongly influenced by the conditions among which they are placed; when those conditions are favorable to their existence, they multiply to an enormous extent, and cover the body completely. This is the state to which the terms morbus pedicularis and phthiriasis (φθεὶρ, pediculus) are particularly applicable. The irritation of these creatures on the skin, and the scratching of the surface which naturally accompanies the itching, give rise to more or less erythema and lichen, and sometimes to pustules, and then the skin presents the characters of a true disease. It is difficult to understand the extraordinary increase of these creatures on the skin in certain cases, even among persons of cleanly habits, and we cannot but come to the conclusion, that certain states of the fluids of the body are peculiarly favorable to their nourishment. Thus, they are sometimes found to be produced during an illness, and in some families have been known to invade the body shortly before death, and so become an admonition of the approach of death. I have seen them teeming on the bodies of persons laboring under malignant disease, in whom the powers of life were scarcely sufficient to preserve the body from decomposition; and probably to this circumstance, to the exhalation of effluvia agreeable to their instincts, their presence in such excessive numbers might be attributed. Stories are on record

relative to this disease that read rather like fable than truth, and yet may have had some truth for their basis. "It is recorded by authors, both ancient and modern," writes Daniel Turner, "that diverse persons have come to their ends, being devoured by lice. among whom the poet Alcmanes and Pherecydes Syrus, mentioned by Aristotle, are accounted." Riolanus says: "Felicitatem Syllæ phtyriasis terminavit; eodom morbo Pherecides, Pythagoræ preceptor, et Alcman perierunt." Of these last, Q. Serenus has these verses:

"Sed quis non paveat Pherecydis fata tragœdi,
Qui nimio sudore fluens, animalia tetra
Eduxit, turpi miserum quæ morte tulerunt?
Sylla quoque infelix tali languore peresus
Corruit, et fœdo se vidit ab agmine vinci."

Turner suggests another idea with regard to them in the following passage, they "are reckoned to prognosticate death or speedy mortality to those they abandon, or when they, shift their quarters unprovoked by medicine or external application."

Some notion has been entertained of the development and existence of pediculi under the skin, and it has been reported by authors that tumors have been opened which were found full of lice. There is certainly no reason against the creeping of pediculi into the sacs of follicular tumors of the skin, feeding on their contents, and afterwards being found to be the sole possessors of these sacs, but in this case they have originally proceeded from the exterior, and crept through an opening which must have been overlooked by the observers in whom the report originated. It is clear from their organization, that pediculi are air-breathing animals, and that they cannot exist under or in the tissue of the skin where they would be deprived of that element.

The PEDICULUS PUBIS is very different in form from the preceding; it is rather square-shaped than long; it is flat, has enormous legs, enlarging towards their extremities like the claw of a lobster or crab, and the body is covered with tubercles, from which proceed tufts of hair. Its resemblance to a crab has gained for it the appellation of *crab-louse;* while other of its names are *plactulæ*, *petalæ*, and *pessolatæ* (probably from its flatness), and *morpiones*. Although termed pediculus pubis, it is also found on other parts of the trunk of the body where there is hair, in the axillæ, eyebrows, and at the roots of the eyelashes; but however abundant on the rest of the body it is not met with on the head.

The pediculus pubis gives rise to great itching, hence it has been named *pediculus ferox;* and by means of its strong feet, armed with a long recurved hook, which closes between two sharp spines, it is enabled to retain its hold upon the shafts of the hair with great tenacity, so much so, in fact, as to render its removal difficult, and scarcely to be effected without the loss of one or two legs. The difficulty is increased by the flatness of the animal, and by the smoothness of its back, over which the finger might pass without detecting its presence. To the eye it is more obvious, and is easily distinguished; and the eye is further attracted to its haunts by the quantity of reddish fecal

matter which it leaves upon the skin, entangled among the roots of the hair.

The skin infested by the pediculus pubis is always more or less torn by the nails; and sometimes it sets up a degree of irritation which pervades the skin more or less extensively, giving rise to an eruption of lichen. On the borders of the eyelids it is apt to create some degree of inflammation.

Like the pediculus capitis, the pediculus pubis fixes its ova on the hairs, by means of the secretion which forms the horny capsule of the ovum. This substance, soft when excreted, soon becomes hard by desiccation, and establishes an inseparable adhesion between the ovum and the hair.

The REMEDIES most suitable for the treatment of the pediculus, whether infesting the head or the body, are the white precipitate ointment, scented with some pungent odor, such as lavender or camphor; the red precipitate ointment;[1] calomel ointment; sulphur ointment or fumigation; a lotion of the bichloride of mercury, and calomel in powder. Several simples have also retained a reputation in this complaint, namely, the seeds of the stavesacre in infusion; the lesser centaurea in decoction; the powdered seeds of the parsley; wormwood seeds; seeds of veratrum, lycopodium, rue, &c.

MALIS PULICIS.

Two species of the pulex or flea are commonly recognized, the *pulex irritans*, the common flea of this country, as well as of the rest of the world; and the *pulex penetrans*, the chigoe or chiggre, a flea met with in the West Indies and South America. The former is merely a cause of irritation and annoyance; the latter is capable of giving rise to a state of real disease.

The pulex inflicts a deep wound in the skin, by means of a pair of very fine and sharp lancets attached to its head, and the sheath of the lancets probably acts the part of a haustellum in drawing the fluids from the wound. Its bite is recognized by a small circular spot or petechia, which it is sometimes important to distinguish from the petechia of purpura. In the petechia produced by the flea, a red point in the centre indicates the perforation made by the little animal, and this point is perceptible under pressure of the skin, while the pinkish disk, in the centre of which it is placed, disappears. In the petechia of purpura, on the other hand, there is no central puncture, and the whole spot remains under pressure of the finger. Occasionally, I have seen the petechiæ of flea-bites purplish in color, and

[1] The Scottish bard Burns seems to have been acquainted with the destructive properties of the "mercurial rozet" for this purpose, as well as of "fell red smeddum," which I take to mean red lead; he suggests their use in the following verse:

"My sooth! right bauld ye set your nose out,
As plump and gay as ony grozet;
Oh! for some rank mercurial rozet,
Or fell red smeddum;
I'd gie ye sic a hearty dose o't,
Wad dress your droddum."

resembling small bruises; in which case the distinction between them and the spots of purpura is not so obvious. As another ground of diagnosis, it may be observed that the petechiæ of purpura are more general than those produced by fleas.

Fleas, like pediculi, have a great repugnance to powerful and fragrant odors; and these may be employed as a means of protection against their attacks, at least when they are not impelled by too fierce a hunger. Lavender, musk, thyme, are all inimical to the instincts of the flea, and Linnæus commends very strongly the seeds of the sea wormwood, absinthium maritimum, as a pulicifuge.

The PULEX PENETRANS, or chiggre, burrows beneath the skin, commonly of the feet, and by the side of the nails, or on the heels, and there deposits ova. This operation is attended with some degree of itching, and often the flea may be seen through the skin as a dusky spot. After awhile a small tumor, as large as a lentil, rises upon its place of concealment, and when the tumor bursts, it is found to contain a small quantity of sanious pus, with an abundance of small, white, oblong bodies, which are the ova of the creature. The tumor is succeeded by a troublesome ulcer, which the hatching ova continue to irritate; new tumors are formed, followed by other ulcers, until the whole foot is in a state of inflammation. The attack of the chiggre is generally confined to the toes, and to the sole of the foot, but sometimes it invades the dorsum of the foot; and the ulcerations to which it gives rise have been known to occasion deep ulcers, with necrosis of the bones; and in some few instances mortification and death.

The treatment of the chiggre is to remove the sac containing the ova without disturbing the latter, for if any of the ova are allowed to escape, the young pulices will prevent the healing of the sore, and all the inconveniences of the original disease will recur. The negroes and natives of the countries where the chiggre is found are peculiarly dexterous at this operation, which they perform with a pin or needle, and by great care succeed in dislodging the sac entire. After the removal of the sac, they dress the wound with the juice of tobacco.

MALIS CIMICIS.

The CIMEX LECTUARIUS is a well-known scourge of large towns and cities; the creature lies hidden by day, but issues from its retreat at night, and feasts upon its victim, destroying sleep and rest, and covering the skin more or less extensively with inflamed and irritable bumps. The cimex has received its specific name of *lectuarius*, or *lectularius*, *bed-bug*, from being found commonly in the joints and crevices of the wood, of which the bed is constructed; here it propagates largely, and is conveniently located for its nocturnal excursions. But it is not confined to the frames of beds alone; it also takes up its abode in the crevices of the walls and of the floor, in the seams and under the folds of clothes; indeed in any situation where it can obtain concealment from the light. The creature is round, flat, and of a red color, is provided with a powerful haustellum, which it buries in the

skin to reach the nutrient fluids of the body, and has a powerful and offensive cinnamon-like smell.

The bumps occasioned by the cimex lectuarius are more or less raised and inflamed, according to the constitution of the sufferer. They are for the most part white and elevated in the centre, where the puncture is perceptible, and more or less deeply red in the circumference. They admit of being mistaken for erythema papulosum or tuberosum; sometimes they are accompanied with an extent of swelling amounting to œdema, particularly when they occur on or near the eyelids, and have suggested the idea of an incipient attack of erysipelas. In doubtful cases the diagnosis may be made clear by a knowledge of the cause, and by the presence of less swollen bumps of a similar kind on other parts of the body.

The best application for the relief of the irritation of these inflamed bumps is, vinegar, Goulard's lotion, spirits of wine and water, or mindererus spirit, the liquor ammoniæ acetatis.

MALIS FILARIÆ.

Helmintiasis. Die Hautwurm.

The FILARIA MEDINENSIS[1] is a worm found under the skin in the southern countries of the world, and particularly in India. The worm is of about the thickness of a crow's quill, grows to the length of several feet, is white in color, and commonly single. There may be several worms in different parts of the body, but only one in the particular nest which the worm makes for itself in the subcutaneous tissues. It gives rise to redness of the affected spot, more or less swelling, and pain, all of which symptoms are subject to considerable variety; the redness may be more or less extensive, the swelling œdematous, and the pain very severe. In Hindostan it attacks both natives and Europeans, and has been known to give rise to so much inflammation and irritative fever as to have rendered necessary the amputation of a limb.

The filaria medinensis is rarely seen in this country, but it has been occasionally met with in persons returning from a residence in India. I have seen two such cases in young military officers; both were out of health, and in one of the two I succeeded in performing the feat in which the natives of India are so expert, namely, of extracting the worm. In this case the filaria measured more than a yard in length.

One of the most striking phenomena in connection with these cases is the length of time during which the worm is latent, and develops no symptoms by which its presence may be surmised. Upwards of twelve months had transpired since one of these gentlemen left India,

[1] Medinensis, from the prevalence of the worm in the country of Medina, in Arabia. Irk medini of Avicenna; vermis medinensis; nervus medinensis; vena medinensis; vena civilis; δρακοντία of the Greeks; dracunculus; Guinea worm. Some of the older physicians, as Galen and Soranus, were of opinion that the filaria was not a worm, but a "nervous concretion," hence the name nervus medinensis. "Pollux calls the dracunculus a piece of corrupted nerve."

before he became aware of anything being wrong with his foot. He then had what appeared to be a small flat abscess on the instep; the abscess burst, allowing a small quantity of sanious pus to escape, and with the matter a thin white cord, like a piece of bobbin, protruded from the opening. He drew out this protruding bobbin to the extent of a few inches, and in a short time the wound healed. Some weeks later he came to me with a small phlegmon on the side of the foot, and complained of its excessive painfulness. I recommended him to apply a poultice. A day or two later I perceived a fluctuating point, which I punctured, and a small white loop about an inch long was projected from the puncture, with a very small quantity of sanious pus. I secured the loop, and drawing upon it gently, one end became released from the opening. The portion which remained measured four inches in length, and this I wound upon a narrow slip of card; I then placed his foot under a stream of cold water, and winding as I proceeded, gradually and slowly drew out about six inches more. I repeated this operation daily for five or six days, and by that time had extracted the whole of the worm—that is, the whole of that portion of which the broken end had first appeared at the opening made by the lancet, this fragment measuring nearly a yard in length.

On the occasion of his first visit to me, there was a good deal of pain extending up the limb; he was unable to walk, and during the progress of the case this pain increased; the skin was œdematous and shining, the ankle swollen and erythematous, and the pain extended in the course of the nerves of the limb, as high as the groin. Once I was obliged to desist from any further traction on the worm for several days, on account of the severity of these symptoms, which excited some irritative fever, and completely destroyed his rest at night, while the foot was so tender that he could not bear upon it the pressure of the bed clothes. My attention was attracted from the first, before I had discovered the cause of his suffering, to the extraordinary disproportion between the apparent local disease and the amount of pain of which he complained; and there was nothing in the slightly-flushed and somewhat swollen blotch on the side of the foot to explain so much suffering. On looking at the smooth and shining skin covering the worm, I perceived a tortuous and slightly-elevated ridge, which no doubt corresponded with the burrow of the animal beneath, and which led me to give credence to the patient's suggestion, that the cause might be the guinea-worm; and having never seen a similar case, I watched it with attention; the result I have already stated.

After each daily operation, a linseed poultice was wrapped around the foot and kept on until the following day. When the traction was commenced, from two to four inches of the worm came out easily; then a little more force was required; this force became relaxed under the paralyzing shock of the stream of cold water; but, after a little while, no amount of force, consistent with the integrity of the animal, could succeed in producing a particle more. When it came out easily the patient experienced no pain; but when it came with difficulty, or resisted further traction, the pain was excessive, and

finally, when no more of the animal could be obtained, contributed to the necessity of putting a stop to the operation. The piece of card was then secured near the aperture of the opening until the next day.

It appeared to me that the inflammatory process, and the suppuration which ensued, weakened the vitality of the animal; and that, to secure its existence, it was necessary that it should be enabled to burrow in the tissues and feed upon them, without occasioning that amount of excitement which results in inflammation. This idea is borne out by the fact of no symptoms of the presence of the worm being experienced until the animal has attained the prodigious length of several feet; that then, for the first time, and as though from the accident of its coming too near the sensitive tissue of the skin, inflammation is set up, and the inflammation is followed by a scanty suppuration. Bathed in the heated fluid of the inflamed tissues, the worm becomes debilitated and exhausted; and when the abscess bursts, or is opened, a torpid loop of the creature is ejected through the opening. This loop may be handled without exciting contraction or motion; it looks soft and swollen, and sometimes is so much softened that it breaks easily; it is also of a different color to the more vigorous part of the worm; the latter is somewhat transparent; its internal structure may be seen through its tegumentary coat, it is firm and even rigid; the extruded loop, on the other hand, is of an opaque white color, and soft. These differences, moreover, are perceptible in the daily operations on the worm; the first portion, weakened in vitality by exposure at the aperture by its unnatural confinement around the slip of card, and by its contact with purulent fluid, is soft, swollen, and opaquely white; it yields easily to the effort of traction, to the extent of two, three, or four inches; it then becomes thinner, more transparent and firmer, and soon resists every amount of force that can be used for its extraction; appearing from the pain which it occasions, to clasp with its coils the walls of the tortuous burrow in which it is concealed, perhaps clutching fiercely on the thread of a nervous filament. The cold water, falling upon its bed from a height, paralyzes its muscular structure for a moment, and an inch more of the creature is wound upon the card, until, in a few minutes, it seems to become part of the flesh itself, and to be immovable. After days of careful and laborious winding of this creature, I was agreeably surprised, on the last day, to find it come out without difficulty, even to the end, perseverance and gradual encroachment had finally exhausted its vitality and powers of muscular resistance.

After the extraction of the worm all pain ceased immediately, and the sinuous ulcer in which the creature had lain imbedded speedily healed. In the second case that came under my notice, there was more pain and inflammation of the foot than in the first, and the worm was so soft as to preclude the use of any force in the attempts made to extract it. At last, after about eighteen inches had been removed, it suddenly broke, and the end became retracted within the skin. As we could not hope to recover the worm, after this

accident, for a week or more, I counselled my patient to go into the country to recruit his health, and to return to London as soon as he perceived any reappearance of the worm. He paid me a visit after a few weeks, but it was only to say that he had seen nothing more of his enemy, and that his foot was quite well. I was not surprised at this report, for it appeared to me that the creature had been destroyed by the inflammation and suppuration, and that the inflammatory action had occasioned a spontaneous cure. Whether this result would have followed in the native country of the animal, it is difficult to say; probably it would not.

Another remarkable phenomenon in the history of malis filariæ is the curious fact of the isolation of the animal; and this is the more extraordinary, as the sanious pus which exudes from the sore teems with hundreds of young filariæ, all minute and all of the same size. Why these young filariæ do not grow to the size of the parent and propagate in the tissues of the skin is most difficult to decide; but all our records of the history of the animal tend to show that such is not the case. And the question suggests itself, are these minute worms the young of the Filaria, or do they belong to a different species?

AMBUSTIO.

Burns and Scalds.

Under the head of ambustio, or burn, we have to consider those morbid conditions of the skin and subjacent parts which are produced by caloric in a concentrated form, whether the immediate agent of injury be irradiated heat, as that from the sun and bodies in a high state of temperature, or whether it proceed from the direct contact of flame, boiling fluids, or heated solids. Proceeding from sources so different, heat will vary in its degree of intensity, and it will also vary in its effects upon the skin according to its duration or continuance. The rays of the sun, however powerful in themselves, are not to be compared with the sudden contact of flame, and the latter is inferior in power to the more prolonged contact of boiling fluids or heated metal. Thus, in degree, heat may be feeble but prolonged; or it may be strong and instantaneous; strong, and continued for a brief period; or strong, and continued for a long period.

These differences in *degree* of heat, and *duration* of its action on the skin, necessarily give rise to differences in effects, such differences constituting the *degrees of burn*, noted from the earliest period of their history, and recognized universally at the present day. Daniel Turner divides burns—

1. "Into such as are superficial, where the skin is lightly scorched, and the cuticle raised into blisters.

2. "Such as go farther, not only blistering the scarf-skin, but altering the texture of the skin itself, which comes away in a light slough.

3. "Into those which penetrate still deeper, burning not only the skin, but flesh and other parts subjacent, into a coal or crust."

Dupuytren has enlarged and improved on this division of burns; he makes six degrees of severity, which he classifies as follows:

1. "Erythema, or superficial inflammation of the skin without vesicles.
2. "Inflammation of the skin, with separation of the cuticle, and the production of vesicles filled with serum.
3. "Destruction of the papillary layer of the skin.
4. "Disorganization of the entire thickness of the skin, down to the subcutaneous cellular tissue.
5. "Destruction of all the superficial structures, together with the muscles, to a variable degree of depth short of the bones.
6. "Carbonization of the entire thickness of the burned part."

For our present purpose, and with especial reference to the skin, it may be convenient to classify burns into three groups, namely: 1. Erythematous burn; 2. Vesicated burn; and 3. Gangrenous burn; leaving the two degrees of destruction of the true skin, and the two degrees of destruction of parts beyond the skin, as sub-varieties of the latter.

ERYTHEMATOUS BURN (ambustio erythematosa) is characterized by a vivid and diffused redness of the skin, some degree of swelling, and a pungent smarting pain. The pain continues for some hours; the redness subsides in a variable period of time, several hours or days, according to the severity of the burn, and is followed by desquamation of the epidermis, and gradual restoration of the skin to its natural state.

Erythematous burn may be occasioned by exposure to the heat of the sun's rays in hot weather or hot climates, and particularly if the part exposed be one usually covered by the clothes; or it may result from the momentary action of hot water or steam, or from long subjection to the heat of a fire. The erythematous burn produced by insolation or the heat of the sun's rays is commonly called *ephelis solaris* (ἐπὶ ἥλιος, the sun); it occurs chiefly in the summer season, and generally in women and children, or persons not habitually exposed to the sun's influence. After the first effects of the erythema have subsided, the epidermis becomes thickened, and desquamates repeatedly; the color of the skin changes to a reddish brown, which is more or less permanent; and the skin loses a part of its sensitiveness to outward impressions.

Erythematous burn occasioned by the prolonged action of the heat of fire on the skin, is illustrated in an affection more common in France than in this country, the *ephelis igneąlis*. This form of ephelis is known by a mottled or marbled appearance of the skin, occurring, for the most part, on the legs and thighs of women, and immediately resulting from the heat of the charcoal brazier, or *chauffrette*, which they use for warming themselves in the winter season. The mottled patches are of a reddish brown color, partly owing to dilatation and congestion of the capillaries of the skin, and partly to increase of cutaneous pigment; and by long continuance of the habit, the mottling assumes a deep brown tint.

The *constitutional symptoms* of erythematous burn are insignificant

or absent altogether, if the burn be slight, of small extent, or the individual insusceptible; but, under the influence of opposite conditions, particularly if the burn be extensive, the action of the heart may be accelerated, and there may be more or less of irritative fever, with gastric or intestinal disturbance. When the head is the seat of the burn there may be sleeplessness and delirium, followed by coma and death. "Cases are related," says Dupuytren, "where persons in hot countries, having gone to sleep in the open air, have been so scorched by the rays of the sun that a violent inflammation of the skin has resulted, the inflammation has been followed by gangrene, and they have died on the fourth or fifth day."

VESICATED BURN (ambustio vesicularis), the second degree of burn of Dupuytren, is indicated by the development of vesicles (ambusta, uritis) on the inflamed and erythematous skin. The vesicles sometimes appear immediately, but more frequently after the lapse of a few hours; they vary in size, and are filled with a transparent serum; occasionally a part of the epidermis is removed at the time of the burn, and then the local action is more severe, and results in suppuration. The inflamed skin is pervaded with an intense burning and smarting pain; and as it becomes swollen, the pain is increased by a sense of tension. When the vesicles are broken or rubbed off, the excoriated derma is acutely sensitive, and becomes quickly covered with a gelatinous and whitish film of coagulated lymph, which serves to protect it. Sometimes, after the first symptoms are past, the pain, swelling, and redness subside, and the skin, after exfoliation of the epidermis, returns to its natural state, without leaving any trace behind; at other times, and especially when the epidermis has been removed at the time of the burn, suppuration and sometimes superficial ulceration are set up, and the burn rarely gets well without leaving a cicatrix.

The *constitutional symptoms* accompanying vesicated burn are more severe than those of the erythematous kind; the shock to the nervous system being greater, and the chances of internal congestion more probable; moreover, the danger is increased as the subject of the accident is more excitable and delicate. I once met with the case of a young child who, standing before the fire warming its hands, was struck on the chest with a jet of boiling water from the spout of a tea-kettle. The inflamed spot was little larger than a crown-piece; the epidermis was raised into blisters. Eleven hours afterwards the child was seized with convulsions from cerebro-spinal irritation, and in nineteen hours was dead.

GANGRENOUS BURN (ambustio gangrenosa) comprises the third and fourth degrees of burns of Dupuytren; the third degree being that in which the papillary layer of the derma is alone destroyed; the fourth degree being the destruction of the entire thickness of the skin.

The *third degree* of burn is distinguished by the presence of one or more patches of a grayish white, yellowish, or brownish color, representing the dead portion of the papillary layer of the skin; the vesicles covering these patches are filled with a brownish, lactescent,

or sanguineous serum, while those on the erythematous part of the burn are transparent. If the discolored patches be lightly touched, they are found to be insensible, but if they be pressed with any force so as to act upon the parts below, the pain is considerable. The pain attending this form of burn is always more severe than that of any other kind, in consequence of the seat of mischief being the most sensitive part of that organ of acute sensation, the skin; and it lasts for one or two days. In three or four days after the burn, the pain, which had ceased, is suddenly renewed, suppuration becomes active, and the process of separation, by which the dead is to be removed from the living tissues, is established. When the ulceration finally heals, it leaves behind it a cicatrix, which is white from the loss of the vascular layer of the skin, and more or less fibrous and areolated, according to the depth in the corium, to which the burn had extended.

In the *fourth degree* of burn the heat is prolonged, until the whole thickness of the skin is burnt through; at first, the surface is dried by the contact of the burning body, and the process of drying is continued until the skin itself becomes inflammable, and burns in the heat which is applied to it. The pain is excessive while the burning lasts, but as soon as it is over, there is a cessation of pain, on account of the entire destruction of vitality of the injured part. The eschar is dark gray, or blackish and yellowish in color, hard, dry, and insensible; and being shrunk by the heat, draws the skin around it into puckers and folds, the latter presenting the erythematous and vesicated forms of burn. In scald the eschar is soft, pulpy, and gray.

At the end of three or four days the process of separation of the slough commences, being ushered in by severe and acute pains, and by the appearance of a broad erythematous band around the eschar. The eschar is loosened by an abundant suppuration, and at the end of from fifteen to twenty days is thrown off, leaving a deep ulcer, which heals up quickly by granulation. The cicatrix which follows the healing of the ulcer is indelible, and often a cause of considerable deformity, on account of the contraction which ensues and the adhesion of parts accidentally drawn together. It is well remarked by Dupuytren, that this contraction rarely takes place on the dorsal side of the trunk of the body and limbs, in consequence of the constant and powerful action of the flexor muscles. In the neck, arms, hands, and feet it is less uncommon.

The *fifth* and *sixth degrees* of burn are simply more complete than the preceding, involving a greater depth of tissues in destruction. They result either from a longer continuance or from a higher degree of heat. In the latter case the effects may be so rapid as hardly to occasion pain. Roche, Sanson, and Begin, report the case of a young man who, having placed his foot in a gutter through which molten metal was about to flow, was overtaken by the stream of liquid fire, and on withdrawing his limb, found his foot and the lower part of the leg gone, without having experienced any sensation of pain.

The *constitutional symptoms* of gangrenous burn differ from those accompanying the erythematous and vesicated burn, chiefly by the addition of certain secondary phenomena, which accompany the sepa-

ration and elimination of the dead portions of the skin. Thus, in a burn, we have to consider two groups of symptoms, primary and secondary, the primary symptoms being those which result from the shock done to the constitution; the secondary symptoms those which are concerned in the reparation of the injury.

The *primary* symptoms are, cerebral and spinal irritation, congestion of the cerebral, thoracic, and abdominal organs, and internal hemorrhagic effusions.

The immediate agent in the excitation of the brain and spinal cord is pain, and the pain is sometimes so great as to destroy life at once, particularly in children and persons of sensitive temperament. Dupuytren was of opinion that pain might exhaust the nervous system of its vital spirits, just as the heart and vascular system are exhausted by excessive hemorrhage, and he distinguished these cases as instances of *mort par excès de douleur*. At other times, the pain, by exciting violently the brain and nervous system, may cause an immediate and instantaneous congestion of the whole of the internal organs of the body, the brain, the lungs and heart, the alimentary canal, with its cavities and glands. This state, in fact, is met with in persons who have been rescued dead from a conflagration, or, although living at the moment, have died immediately afterwards; the brain, heart, lungs, and mucous membrane have been found gorged with blood, extravasation has occurred in many places, particularly in the mucous membrane, and blood has been effused by exhalation into the cavities of the mucous and serous membranes. This state of congestion is termed primary, from its occurrence at the time of the injury, and to distinguish it from those phenomena which are the consequence of reaction, secondary phenomena. The effect of violent congestion of the heart is to arrest the function of that organ, and cause immediate death.

In every case of burn, therefore, of any extent, we have to deal with the shock to the nervous system, which may, as we have seen, exhaust life at once; or by excitement and violent stimulation of the nervous system, cause a rapid and serious congestion of all the organs of the body. In the one case we may find extreme prostration of muscular power, mental stupor, cold skin and extremities; small quick pulse, and slow respiration. In the other case we may have excessive agitation, mental excitement, restlessness, sleeplessness, convulsions, and a high degree of fever. In both, congestion of internal organs may occur, and both may be speedily fatal, or may give way to more favorable symptoms; in the one reaction, in the other calm and sleep.

The *secondary symptoms* of burn, or those which belong to the reparative period, are such as accompany the development of inflammation and suppuration for the removal of the injured parts, and the exhaustion which necessarily follows the suppurative process. According to Dupuytren, there are four epochs of danger in the course of a burn: firstly, the period of irritation; secondly, that of inflammation; thirdly, that of suppuration; and fourthly, that of exhaustion. The inflammatory reaction may be so severe as to give rise to a state

of general fever; the patient has a frequent and full pulse, the skin is hot and parched, the tongue red and dry; there is thirst, nausea, and vomiting, and every indication of gastro-intestinal irritation, frequently complicated with cerebral and pulmonary congestion. The limits of this period are from the third to the ninth day. After suppuration is established, serious internal lesions may result from the absorption of pus; and during this period the internal congestions which have already taken place may undergo further morbid changes, and result in ulcerations, perforation of the duodenum, destruction of tissues, and other dangerous consequences; while the period of exhaustion, from a long-continued drain on the powers of the constitution, is also a stage of considerable danger and anxiety. Besides all these unfavorable conditions, the patient may be the subject of erysipelas, or phlegmonous erysipelas, at any period of the progress of the injury.

My friend, Mr. Grantham, of Crayford, in Kent, has published a remarkable case of burn, in which several of the points of difficulty and danger here laid down are illustrated.[1] The patient was a boy, about seventeen years of age, who was burned by fireworks exploding in his pockets; the burn occupied nearly the whole of the trunk of the body, destroying the entire thickness of the skin, and offered an extent of six hundred superficial inches, equal to four feet twenty-four inches of surface; and was a quarter of an inch in depth. The *period of depression* lasted forty-eight hours, being marked by coma, a rapid fluttering pulse, and coldness of surface; and *reaction* was accompanied by an excitable state of the brain, a pulse ranging between 150 and 200 beats in the minute, and an irritable stomach, that refused to retain fluids of any kind. This state continued for a period of four days, and was succeeded for twenty-five days by a low typhoid form of fever. The fever then abated, and he gradually improved until the seventh month, when he was attacked with bronchitis, accompanied with sanguineous expectoration. At the end of eighteen months he was able to walk a short distance, and then had a violent attack of erysipelas, and was not finally cured until nearly five years after the accident.

The treatment pursued during the *period of depression*, was opium, brandy, beef-tea with arrowroot, artificial heat by means of hot bottles to restore the warmth of the body, and the application of spirits of turpentine to the edges of the burn. During the period of *reaction*, while the stomach was so irritable as to reject all fluids, beef-tea was exhibited in the form of enema; and shortly afterwards, bicarbonate of soda and compound spirits of ammonia were given in drachm doses by the mouth, as the stomach would bear them. During the continuance of the typhoid fever he was nourished with beef-tea, mutton broth, and port wine; and as the typhoid symptoms abated, was plentifully supplied with milk, taking on an average six pints within twenty-four hours.

[1] Facts and Observations in Medicine and Surgery: the gleanings of ten years of active general practice, &c. Churchill. 1844.

The local treatment consisted of linseed poultices with yeast; dusting the separating parts with powdered bark and chalk; and when the typhoid fever had abated, dressing the ulcers with spermaceti spread on lint, covering the lint with cotton-wool, and then applying a roller.

The attack of erysipelas, which occurred at the eighteenth month, had the effect of enlarging the dimensions of the ulcer from forty-five to one hundred and fifty inches; recourse was again had to opium in small doses, and nitric acid; and after the subsidence of the erysipelas, the healing progressed with rapidity. By the end of the second year the ulcer was reduced in size to twelve inches; and by the end of the third year to one inch; it now remains "in a passive state for the space of a year and a half" before it finally healed.

During the whole process, Mr. Grantham remarks that there was a greater or less "tendency to congestion of the brain," which was "relieved by small bleedings, occasional saline aperients, and a strict attention to diet, especially in reference to the use of stimulants, which never appeared to be indicated."

Of the *cause* and *diagnosis* of burn nothing need be said more than has been already related. The *prognosis* of the burn is a question, into the answer to which a number of considerations enter—namely, its extent, both in breadth and depth; its seat, whether upon the trunk of the body, the face, neck, or limbs; the age of the patient, his constitution and temperament; and the nature of the agent causing the burn, whether fluid or solid, whether limpid or dense; whether of a moderate or excessive degree of temperature; whether in the form of steam or flame; whether combined with mephitic vapors; and whether instantaneous in its application to the skin, such as the explosion of gas or gunpowder, or prolonged. Again, the question of prognosis not only involves the consideration of the primary and secondary dangers attendant on burn, but also, if the prognosis be favorable, the nature of the cure; burns of the first, second, and third degree produce no deformity, but burns of the fourth degree are often followed by considerable deformity, from the contraction of the surrounding skin, which ensues during healing, and the adhesion of parts (during the granulating period) that ought to be kept separate. Thus, in burns of the neck, the chin is liable to be drawn towards the chest, or to one or other shoulder; and in burns of the hands and feet, the fingers and toes may be drawn out of their proper axes, and the joints dislocated. All things considered, therefore, the prognosis of burns is uncertain.

TREATMENT.—The management of burns and scalds presents two indications for immediate attention; firstly, to relieve pain, calm the nervous system, and restore the circulation to its normal standard; secondly, by local applications, to supply a covering of defence, which shall be soothing and agreeable to the injured part.

The first of these indications is to be accomplished by means of opium conjoined with warm brandy and water, the dose to be proportioned to the severity of the suffering, and its repetition regulated by the continuance of the symptoms. The opiate to be preferred is the liquor opii sedativus, of which the dose may be fifteen minims; or in the absence of the sedative solution of opium, the tinctura camphoræ

composita, two drachms; or tinctura opii, half a drachm. The sedative may be repeated at the end of two or three hours, if necessary; and the brandy-and-water as often as may be requisite; bearing in mind that the stage of depression will, if the patient survive, be followed by a stage of reaction, when an opposite method of treatment will be required.

The best local application, where the cuticle is unbroken, is flour, which possesses the additional advantage of being always at hand; it should be thickly dusted over the burnt or scalded part by means of the dredger; a layer of wadding or cotton-wool should be placed next, and then a bandage, lightly but firmly applied to prevent friction. The purpose of the local application is threefold: namely, to cool the heated skin; to exclude the atmospheric air, which is always an irritant to an inflamed surface; and to preserve the part in a state of repose and defend it from pressure. Hence all meddling is objectionable, and the part once secured should not be disturbed, even although the pain increase after the dressing has been applied.

When blisters are formed they may be pricked with the point of a needle, to prevent them from bursting and causing excoriations; and where excoriations exist, they may be covered with a liniment of olive oil and white of eggs (pars ^{1} ad ^{2}), or with the benzoated ointment of oxide of zinc. It sometimes happens, that when the flour has been on for some time, and particularly where there has been any serous effusion from the vesicles, that it cakes, and becomes hard and uncomfortable to the skin. In this case, the surface, and particularly the crevices of the dried crust, should be moistened with the liniment mentioned above; or with a liniment of lime-water and olive oil; or lime-water and linseed oil (equal parts), and the whole covered with lint, spread with the benzoated ointment of oxide of zinc, and afterwards some cotton-wool, and a light bandage.

In the third and fourth degrees of burn, where a portion of the skin has been killed by the heat, and the cuticle is excoriated to a greater or less extent, while in the circumference, the injured part presents the erythematous and vesicated degrees, the denuded part may be pencilled with either of the liniments already mentioned, while the circumference is dredged with flour. Then the denuded part should be covered with lint spread with zinc ointment. Sometimes, with the idea of bringing back the vitality of the part killed by the heat, or of preventing parts which were merely weakened from falling into the state of gangrene, the stimulant properties of turpentine are added to the remedy. This may be effected by rubbing down a little common turpentine with either of the above liniments; or the part may be dressed with the unguentum elemi compositum, after the application of the simple liniment to the skin. It was upon this principle that Mr. Grantham, in the case above narrated, bathed the edges of the injured part with spirits of turpentine.

Whenever a burn or scald has been received on a covered part of the body, the clothes should be removed, and with extreme care, lest the cuticle be rubbed off, and the part excoriated; and the part being completely exposed to view, the flour dredger should be imme-

diately brought into play. It has been recommended immediately a burn occurs, that the part should be plunged in cold water, and kept there until the burning pain has subsided; this, however, can only be done where a part of a limb is concerned; and there can be no objection to it as a preparation for the flour application. In burns or scalds of small extent, a poultice of the pulp of raw potatoes, or a poultice of soap, are favorite popular remedies, and perfectly innocent; but are neither so pleasant nor so convenient as the flour dredging. Again, when the shock to the system has produced a chilled state to the surface, the moist and cold applications would be objectionable, as tending to aggravate that state. Fabricius and Sennertus used the pulp of raw onions, in combination with oil, soap, and salt; or oil, white of egg, and salt, when the skin was unbroken, but omitted the onion and the salt where the surface was vesicated. A liniment composed of the whites of two eggs, two ounces of olive oil, and one of rosewater, was esteemed a great secret in the time of Ferrarius, by whom it was applied by means of a piece of linen rag; the rag being kept on the skin, and saturated twice or thrice a day with more of the liniment. The green parts of the elder were also much used, made into an ointment with fresh butter.

In illustration of the principle of securing an impermeable covering to the burn, and leaving it undisturbed, a principle which I have already advocated in the treatment of eczema, I may mention the remark of a house-surgeon of a London hospital, emulous of distinguishing himself during his week of service. I met him one day at the corner of a street, when he said: "I never left the hospital for an entire week, and got nothing but a cut finger and six burns. The burns all died, with the exception of one, and he was the worst; he had tumbled into a vat of boiling soap. When he came to the hospital he was covered with the soap, which had congealed on the skin, and we could not remove it without bringing off the skin at the same time. We could do nothing for him, so we left him alone; and he lived." This brief commentary on a week's idleness contains volumes for reflection and thought. The poor man who fell into the soap-maker's vat found the wound and the antidote at the same moment, he came out surgically dressed; the injury was immediately sealed up by the hardening soap, the air was instantaneously excluded; and although badly scalded, and having one of the most dangerous of burns, that of a large surface, the whole surface of his body in fact, he lived. Accident has given us here a lesson, an example, for imitation.

In burns of the third and fourth degree, where we look for inflammatory reaction and subsequent suppuration for the removal of an eschar or slough, inflammation may sometimes run too high; and we may find it necessary to subdue the inflammatory action by means of evaporating lotions, which may be applied externally to the immediate dressing. On the other hand, it happens most frequently that gentle stimulation is necessary, to quicken the flagging powers of the skin, and hasten suppuration, and the separation of the dead parts. In the latter case we find a useful auxiliary in lotions of the chloride of lime, (℥i ad ℥viij); in the compound ointment of elemi, or in the yellow

basilicon, the unguentum resinæ. Daniel Turner remarks, in reference to the manipulation of burns, that, "at this, if at any time, the lady's hand is required;" and, in reference to the class of burns now under consideration, he observes, "I seldom found occasion to use other than my unguentum de lapide calaminari from first to last, which is anodyne, digests, incarns, and cicatrizeth to admiration;" and he further lauds the uses of the oxide of zinc, under the magnificent name of *Diapompholigos*.

After the period of depression, which may last for twenty-four or forty-eight hours, is past, and reaction is established, we may have to treat constitutionally those conditions of the general system which accompany inflammation and congestion of internal organs. We must have recourse to mild aperients, effervescent salines, and an antiphlogistic regimen; we may be required to abstract blood generally and locally, and contend with the various congestions as they show themselves. In Mr. Grantham's case, it will be seen that he had to combat in succession typhus fever, bronchitis with sanguineous expectoration, erysipelas, and symptoms of congéstion of the brain. In the suppurative stage of the injury, where the powers of the constitution are exhausted by a long-continued drain, it will be found necessary to have recourse to a generous diet and tonics.

Professor Hebra, of Vienna, has recently suggested for the treatment of burns and scalds, as also for certain eruptions of the skin, a perpetual warm bath; and he has deposited at the International Exhibition of 1862 his apparatus for that purpose. He mentions the case of a washerwoman, aged thirty-eight, "extensively burnt all over the body, *dermatitis ambustionis escharotica*," who was kept in the bath "during twenty-one days, or 504 hours, without interruption, and left it perfectly healed of her sores." And another, of a man twenty years old, who had received a severe burn of his lower limbs from falling into a lime-pit; he was placed in the bath apparatus, and left there for twenty-eight days, or 672 hours, until the sores were perfectly healed; the burn in this case had destroyed the vitality of the skin completely, and it fell away from the parts beneath in charred masses. He also gives the case of a boy suffering under chronic pemphigus, who "was kept for 100 days, or 2400 hours, in the warm bath apparatus, and left it only when all symptoms of the disease had disappeared." On a relapse taking place some months afterwards, the boy was again placed in the bath at his own repeatedly expressed desire.

Professor Hebra's bath apparatus is a box, 6 feet long by 3 wide, made of wood, and lined with copper or zinc. Inside the box is an iron frame or stretcher, and upon the stretcher is placed the bed, covered with a blanket, and furnished with a horse-hair bolster; while at two feet distance from the head of the bed is a back support, moving on a hinge, and admitting of being fixed by means of a simple piece of rack-work, at any angle that may be agreeable to the patient; moreover, at each extremity, the bed is suspended by two bands, which work upon rollers attached to the margin of the box, and enable the attendant to raise or depress the bed, and so alter the posi-

tion of the patient without otherwise moving him. The supply of water to the bath is obtained from a copper boiler placed above the level of the bed, and near its head; the water flowing into the bath enters at the bottom, and the escape pipe leaves it at the water level; "the stream is kept constantly running, and thus all impurities are rapidly washed away from the surface." If it be desired to keep the face continually wet, special small tubes, with different roses affixed to the boiler, are provided for the purpose.

The water of the boiler is intended merely to secure a current in the bath; the bath is filled daily independently of the boiler with water of the required heat, ranging from 90° to 100° of Fahrenheit. When the patient is properly placed and the bath filled, the apparatus is closed with a wooden cover, and over this a woollen blanket is spread; and if it be required to cover the head as well as the body, a small frame constructed of hoops answers the purpose.

Of the practical results of the process, as well as its theory, "the application is too novel at present to permit of conclusive judgment." The apparatus "requires continual attendance," to keep the temperature uniform and to secure the safety of the patient, "although there exists not the slightest danger that the patient, in sleeping, may run the risk of being drowned." During the experiments heretofore tried, nothing has occurred to suggest the apprehension of such a danger.

GELATIO.

Frostbite. Pernio. Chilblain. Kibe.

Cold in great severity, or applied for a long time to the surface of the body, or acting upon a sensitive constitution, produces local insensibility, and may proceed to the extent of actual freezing of the part affected. The first action of cold is therefore upon the nerves of the body, and it attacks primarily those parts which are the most distant from the centres of innervation and circulation, namely, the feet, the hands, the ears, nose, chin, cheeks, and the surface of the body, extending from the surface inwardly to the more central organs. With the insensibility or numbness of the chilled part there is diminished or arrested circulation, producing paleness and contraction or diminution of size, and there is also loss of motion, or stiffness. The arrest of circulation and loss of power of motion are, however, consecutive to and governed by the loss of sensation.

Gelatio naturally presents every degree of severity, from the mere chilling of a very limited extent of the surface of the skin, constituting *chilblain*, to positive freezing and death of a part of the body. In the one case there is a mere suspension of vitality, in the other a state of complete death. So long as the state of chill is progressive or persistent at the same point, the signs of gelatio are those already indicated, namely, numbness or insensibility, paleness, reduced size, and immobility; but when the temperature undergoes a degree of elevation, however slight, such as that which causes a thaw, then a new series of phenomena are presented by the congelated part, phenomena which are comprehended by the term *reaction*. Sensation

returns, but the sensation is of a painful kind; a teasing itching, where the chill is superficial, and a burning, tingling, or severe and acute pains, where the chill has reached the deeper nerves. Circulation also returns; the part becomes red, swollen, and hot, in the first stage of reaction, blue and livid at a later period; in other words, a state of inflammation of the skin, or erythema, takes the place of the previously pale and benumbed condition of the part.

But where the cold has been so severe or so long continued as to destroy the life of the part, that part retains the insensibility, the coldness, and the paleness of death; while the living parts alone take on the characters just mentioned—namely, the redness, the heat, the swelling, and the pain. The redness of the skin terminates by an abrupt line, and at this line it is, the *line of demarcation*, as it is termed in surgical language, that the actions which result in the separation of the living part from the dead take place. The dead part remains contracted and shrivelled, it becomes dry and dark colored, finally black; and ultimately is thrown off, if it be superficial, or drops off, if it be a part of a limb.

These being the general effects of cold upon the living body, we may now turn our attention to those slighter degrees of chill so common and so troublesome amongst children and adults of weakly powers of innervation and circulation, during the winter season; those minor troubles which go by the names of perniones, chilblains, and kibes.

Chilblains, like burns, admit of division into three groups, which represent so many degrees of severity of the affection: they are, the *erythematous* chilblain; *vesicated* chilblain; and *gangrenous* chilblain.

The ERYTHEMATOUS CHILBLAIN (*erythema a gelu*), originating in the lowest degree of cold applied to the skin, is not discoverable until the stage of reaction is commenced. A child may have been exposed to the cold during the day, and in the evening returns to a warm room, and a seat near the fire. Then for the first time the chilblain declares its presence, generally on the feet, on the heels or on the toes, or on the hands, by itching and tingling; and if the part be examined, it is found to be red and swollen. The itching is incessant and tormenting, and continues until sleep overtakes the little victim. In the morning, or after a few days, the chilblain has a bluish and livid appearance, resulting from the establishment of a permanent congestion of the part, dilatation of the capillaries, and retardation of the circulation; the retarded circulation allowing time for the change in the blood from its arterial to its venous character. In this way and under this form the chilblain may be perpetuated during the continuance of the cold weather, fresh chilblains appearing from time to time, giving rise to swelling and tenderness of the feet, which prevent the little sufferer from walking without pain, and exciting fresh attacks of itching every time an alternation of temperature from cold to warm occurs. As already observed, the chilblains may seize upon the lobes of the ears, upon the ears themselves, and also upon the nose, or the prominent parts of the face.

The VESICATED CHILBLAIN, or broken chilblain, is either an aggrava-

tion of the preceding, or the result of a greater degree of cold. During the continuance of the cold, it may be accompanied with a greater or less degree of numbness; and on the change to a more elevated temperature, the pruritus, the swelling, and the congestion are more considerable. The vesicated chilblain, moreover, has a purplish, livid tint, and the cuticle gradually separates by effusion beneath it, and forms a vesicle or bulla of variable extent. The contents of the vesicle are a sanguinolent serum, and the surface which is exposed on its bursting is either livid or variously mottled with red, blue, or gray, the gray portion indicating the commencement of a slough. Besides heat, tingling, and itching, the vesicated chilblain is attended with considerable pain, it ulcerates to a greater or less extent, and prevents the child from walking. Although not dangerous, broken chilblains are very painful and troublesome, often lasting the greater part of the cold weather.

The GANGRENOUS CHILBLAIN is rather a frostbite than a mere chill of the surface of the skin, like the true chilblain. The vitality of the affected part is destroyed by the cold, and a state of gangrene, followed by the separation of a slough, ensues. The two former degrees of chill are unaccompanied by constitutional symptoms; but the frostbite or gangrenous chilblain is often associated with symptoms of general prostration and congestion of the vital organs, particularly of the brain, and sometimes terminates fatally.

TREATMENT.—The treatment of gelatio and chilblain is to restore the innervation and circulation of the part, and to effect this restoration gradually. If reaction occur rapidly, and an active circulation be set up in the tissues lowered in their vitality by the effects of the cold, inflammation and probably death of the chilled structures will ensue; the object of treatment is, therefore, to bring about a return of sensibility and circulation in the slowest manner possible. To this end the patient should be placed in a cold room, and frictions made on the part with the hand. If the part be frozen, snow or cold water may be rubbed upon it, to thaw the frozen tissues by degrees; then the hand alone may be used, with a little starch powder, to prevent attrition, and guard against the too great heat of the hand; then some mildly stimulating liniment may be used; and, finally, the part may be enveloped in cotton-wool or flannel.

With a common erythematous chilblain, all these precautions are unnecessary, but the general principle of management should be the same. Frictions with starch powder, frictions with mild liniments, then the use of stronger stimulants; and all with the view of bringing back the normal circulation of the part, and restoring its tone, avoiding always, and as much as possible, approach to the fire. One of the most useful remedies for the above purpose is a liniment composed of the white and yelk of two eggs, two ounces of spirits of turpentine, and two ounces of distilled vinegar, well shaken together. This liniment may be lowered in strength, if thought desirable, by more vinegar; or it may be increased in power and made more anodyne by the addition of laudanum, camphor, or chloroform; or it may be rendered more stimulating by the addition of ammonia. If turpentine be ob-

jected to, a liniment of camphor, ammonia, and laudanum (two parts of camphor liniment to one of liquor ammoniæ and one of laudanum), may be preferred. Sir Henry Halford was wont to prescribe soap liniment with tincture lyttæ, six parts of the former to one of the latter. Dr. Turnbull recommended a tincture of cayenne[1] to be rubbed on the chilblain by means of a sponge, until tingling and a feeling of electricity were occasioned in the part. Rayer suggests a strong solution (ʒj ad ʒxvj) of alum; and Dr. Balfour, of the Royal Military Asylum at Chelsea, uses, amongst the numerous boys under his care, a mixture of equal parts of compound tincture of iodine and liquor ammoniæ, which he causes to be painted on the chilblains twice in the day.

The vesicated and ulcerated chilblain are to be treated, according to their state of activity or indolence, with the water-dressing applied by means of Alison's impermeable lamb-skin; the benzoated ointment of oxide of zinc; the calamine ointment; or some more stimulating remedy, such as an ointment of Peruvian balsam (ʒj ad ʒj), the unguentum elemi, or ceratum resinæ. In the broken state of chilblains, Dr. Balfour prescribes, with great success, an ointment composed of equal parts of ceratum resinæ and spirits of turpentine.

The gangrenous chilblain and frostbite are to be treated, after the restoration of circulation in the sound parts, in the same manner as sloughing and gangrene resulting from burns.

CHAPTER XIII.

DISEASES ARISING FROM SPECIAL INTERNAL CAUSES.

THE diseases assembled under this head, arising from specific causes, those causes being internal and obscure, and presenting characters in common with each other, namely, prominence and permanence, are five in number, namely,

Lepra, Scrofuloderma,
Lupus, Kelis,
Elephantiasis.

Of these diseases, the least degree of prominence is met with in Lepra, which is especially characterized by the development on its surface of a scaly covering; hence, lepra is the type of the order SQUAMÆ of Willan. The other four, on account of their prominence, belong to the order TUBERCULA of Willan. The whole of these diseases are remarkable for their chronic character and obstinate resistance of treatment.

In previous editions of this book lepra was associated with two other

[1] ℞.—Capsici contusi, ʒj; spiritus vini rectificati, ʒiij; macerate for a week, and strain.

affections, namely, psoriasis and pityriasis, under the general head of "squamous inflammation of the derma;" but longer experience and more careful investigation have convinced me that lepra should stand alone, the term psoriasis, which has been used indiscriminately for varieties of lepra, and for that kind of chronic thickening of the skin which often succeeds to eczema and lichen, should be applied to the latter only; and that pityriasis, which bears no relation to lepra whatever, but is a mere chronic erythema of the skin, accompanied with furfuraceous desquamation of the epidermis, should be carried back to the erythematous group. In fact, lepra or not lepra? will in future be the question to be determined by diagnosis, and a vast quantity of confusion will be spared to the student of dermatology; we may then hear of the cure of psoriasis, a comparatively easily curable complaint, without feeling the doubts which rise to the mind when a lepra is believed to be the disease in question; and by means which, in truth, are not in the least calculated to make an impression on lepra.

A glance at the derivation of the term *psoriasis*, supplies an additional reason for discarding it from its connection with lepra. Psora is derived from the Hebrew word *tsorát*, signifying venom or malignity, and is a generic term for the worst forms of the leprosy of the Jews. The Greeks, in their translation of the Hebrew writings, gave to the disease which tsorat represented, a word of their own, namely, λεπρα, and dispensed with the term *tsorat* altogether, or so entirely misappropriated it, that it lost its original signification, and "wandered in search of a meaning." It has since "had at different times, and by different persons, various meanings attributed to it; being sometimes used to express scaly eruptions generally, sometimes the scales of leprosy,"[1] then the scaly state of the skin which accompanies scabies (psora), and lastly, the scaly stage of chronic eczema. With the latter meaning, the word psora, with its altered termination, making it psoriasis, is used by Willan, Bateman, and Mason Good. Tsorat and psora are also the origin of our own popular expression, *sore*.

The cause of the present group of diseases is obscure; it is, probably, some poison present in the blood, engendered by conditions either external to the body, or within the economy itself. Numerous observations have led me to the conclusion that lepra originates in the syphilitic poison, the poison being modified by transmission through one or more generations. Lupus, in some instances, is clearly referable to the poison of syphilis; in others it seems to appertain to an affection equally mysterious, namely, scrofula; and scrofula, I believe to derive one of its sources from syphilis. Kelis is allied with scrofuloderma, often making its appearance on the cicatrices of scrofulous sores, or in children suffering under scrofulous affections. The cause of Elephantiasis is as much a mystery, as deeply plunged in obscurity at the present day as it was before the commencement of the Christian era, when it made its first outbreak among the inhabitants of the banks of the Nile. From Egypt it travelled through Syria to Greece; from Greece it pursued a westerly direction through Europe. After ex-

[1] Mason Good.

hausting itself in England, it moved northward into Scotland, from Scotland to the islands of Orkney and Shetland; and at the present moment rages with severity in Iceland, and on the coasts of Norway and Sweden.

LEPRA.

Syn.—*Common dry tetter. Circular dry tetter. Diffused dry tetter. European Leprosy. Alphos. Lepidosis lepriasis. Dartre squammeuse. Dartre furfuracée arrondie. Herpes furfuraceus circinatus. Herpes squamosus. Aussatz, Schuppenflechte.*

Lepra (Plate XII.) is a non-contagious and chronic inflammation of the derma, consisting in the eruption, on various parts of the body, of raised and circular patches, which are speedily covered by thin, semi-transparent scales of white and morbid epidermis. The patches are prominent around their circumference, and somewhat depressed in the centre; they increase by the extension of their periphery, while the central area gradually returns to the natural state. During the progress of the patches the scales are often thrown off, and replaced by successive formations. The local disorder is unaccompanied by constitutional symptoms; it is most strongly marked in the neighborhood of the knee and elbow joints, where it frequently forms continuous patches of large size (Plate XII., G.) and endures for a considerable length of time, sometimes recurring at particular periods for several years, and lasting for several months at each recurrence.

The patches of lepra begin by small flat tubercles, of a brickdust red color, and very slightly raised above the level of the surrounding skin. Like the pimples of lichen, they are developed around the pores of the skin, and at their first appearance are only twice the size of the erected pores of cutis anserina; the diameter of the latter, when round, being half a line; and when elliptical, as they commonly are, half a line in breadth, and three-quarters of a line in length. Starting with a size of one line in diameter, the tubercles of lepra soon attain their mature development, and measure two lines in breadth. The pathological element of lepra is, then, a small flat tubercle, very little larger than the papule of lichen, and occupying, like the latter, the mouth of a perspiratory tube or cutaneous follicle.

Having reached its full stage of completion, the leprous tubercle may remain stationary, and become capped with its little white scale of morbid cuticle, bestowing all its power on the production and reproduction of this scale. More frequently, however, it excites around itself a little erythema, and more or less puckering and distension of the immediately adjacent epidermis. It is now converted into a small *patch* of from three to four lines in diameter, consisting of a central tubercle, and the slight halo of erythema and puckered cuticle just described. The eruption sometimes becomes arrested at this stage, and constitutes the form of lepra termed *lepra guttata;* the small slightly-raised patches, with their little white caps, having about the diameter and somewhat the appearance of drops of water

scattered over the skin. Sometimes the erythema extends a little farther into the surrounding derma, and attains a diameter of five or six lines. When this occurs, the included pores rise like the first into tubercles, and the patch is found to be composed of two, three, four, or five tubercles, the integument between the tubercles being erythematous, and raised above the level of the surrounding skin, although not so elevated as the tubercles themselves. A similar result follows when two, three, four, or five tubercles occupy adjacent pores at the same time; the patch is composed of a cluster of tubercles, but rarely exceeds the diameter of half an inch.

From this description, it will be seen that lepra guttata is lepra in its most elementary form; the tubercles are dispersed and isolated, the presence of a cluster of two, three, or more tubercles being the exception and not the rule. In a case of lepra guttata now before me, there are about eighty tubercles and patches, scattered over a surface as large as my hand; of this number, about one-third are isolated tubercles, from one to two lines in diameter; one-half are small patches, three lines in diameter; while the remainder are clustered patches, varying in size from four lines to six and seven. The function of the tubercles and patches is, as it were, consumed in the production and reproduction of thickened and morbid epidermis, which is cast from time to time in the form of scales, in other words, their action is vertical and not peripheral.

We have next to consider the same pathological elements, conjoined with a greater energy of growth, and a disposition to peripheral as well as to vertical increase. These are the characters which mark *lepra vulgaris*, or, as I propose to name it, from the roundness of figure of its patches, and to distinguish it from other forms of lepra, *lepra circinata*. Lepra vulgaris consists of patches of a circular form, varying in diameter from half an inch to an inch and a half or two inches, the common size being an inch, and composed of a cluster of flattened tubercles, having separately a diameter of two lines. The patches of lepra vulgaris make their first appearance in a cluster, the tubercles attacking adjacent pores, and quickly becoming more or less blended with each other. As they enlarge the patch becomes more or less uniform, but a certain unevenness of surface always indicates their original composition of separate tubercles. The patch of lepra vulgaris enlarges by its circumference, gradually creeping into the sound skin, and exciting as it goes the production of new tubercles, and the fusion of these new tubercles into a rounded border of greater or less elevation and uniformity. As this peripheral growth proceeds, the tubercles in the centre of the patch slowly subside, and after a time the skin assumes its normal characters. The patch is now converted into a ring, of which the dimensions of the area gradually increase, while the growth of the border continues, invading, as it proceeds, a greater extent of skin, but rarely exceeding the dimensions of an inch and a half or two inches.

The arrest of growth of the periphery of the patch of lepra vulgaris, and the increasing dimensions of its area, constitute the *stage of dispersion* of the eruption; the border becomes more and more nar-

rowed as the area enlarges, and before long the ring itself gives way, sometimes at one point, sometimes at several, the tubercles having subsided, and the skin having resumed its normal appearance. When the eruption is seen at this period, that which a few days back was a ring is now changed to the figure of the letter **C**, or, having yielded in two places, it represents two crescents, or may be, having faded further, only a single crescent or a part of a crescent. Then, if two patches have so increased that when they are converted into rings, the two rings come into contact, we have the figure **8**, or if both rings have given way, one on the one side, the other on the other, the figure is that of an **S**. Again, if, instead of two rings, three, four, or five, variously grouped, have become connected by progressive growth, and have lost part or parts of their circles by dispersion, it is clear that a variety of curious and grotesque figures may result, one while, resembling a chain, at another, astrological and necromantic signs. These appearances, the mere phenomena of dispersion of the eruption, have, to the confusion of dermatographic science, received the name of *lepra gyrata*. The lepra vulgaris of last month is a new species to-day, parading the distinction of a separate appellation.

There are certain regions of the body that belong especially to lepra, where lepra frequently begins, where it exists solely in some instances, and where it lingers to the last, when it has dispersed everywhere else; these regions are the elbows and knees. If there be any doubt as to the diagnosis of an eruption, look to the elbows and the knees; if it do not exist there, and has not visited those regions, it is not lepra. If a patient in Australia write to his physician in London, as has occurred to myself, that he is troubled with a dry, scaly eruption, dispersed over his body, and particularly troublesome on his elbows and knees, the diagnosis is unmistakable; prescribe for lepra; the rule is as certain and as free from exceptions as any other general rule depending on natural laws. But the eruption on the elbows and the knees presents a peculiarity, which is, that it obeys a regional or local law, with regard to increase, and not the specific law which governs the eruption in other situations. It invades the whole region, constituting a patch of large size and irregular figure, in place of the moderate size and circular patch of other parts of the body. This peculiarity is more conspicuous at the elbow than at the knee.

Now, if we look into the structure of this broad patch, we shall find that, in consequence of its size, it has lost some of the characters of the smaller, rounder, and more isolated patches. It is, in fact, an extensive cluster of tubercles of uniform size, less closely aggregated than in the circular patches, without the rounded border which forms the circumference of the latter, consequently without the depressed centre; and when it disperses, subsiding irregularly, the tubercles disappearing here and there, without order, and leaving islets of normal skin, and frequently yielding last of all at the point of the elbow; although the law of peripheral growth is strong in these larger patches as it is also in the smaller, and the margin is not uncommonly the last part to disappear.

Sometimes lepra assumes this diffused character as its general outbreak, and entitles itself to the appellation of *lepra diffusa.* The body is covered more or less extensively with patches of large size and irregular form, consisting obviously of a large irregular cluster of tubercles of uniform size, scattered over the area of the patch, and assembled with greater or less order along its margin. There is no sinking towards the centre, because the central tubercles persist as long as those of the periphery, and the cure of the patch takes place by the subsidence of certain of the tubercles here and there, and the clearance, as it were, of small spaces of normal skin. It is true, that were we to go further into the inquiry, we should find this apparently accidental subsidence of the tubercles in the midst of these patches, governed by a peripheral law, each group of tubercles obeying the same power as that which governs the entire patch; but this is unnecessary. Now, the form of lepra which I am here describing is that to which the term *psoriasis* has been improperly assigned, and from which I shall endeavor to remove it. I have already explained the derivation of psoriasis, and shown that its sole "locus standi" is that state of chronic thickening of the skin which sometimes follows erythema, but more frequently lichen agrius and eczema, in which there is redness, thickening of derma, and exfoliation of epidermis in scales of greater or less magnitude. But this state of skin, which is not unfrequently combined with the exudation of an ichorous fluid, is totally and entirely distinct from the clusters of tubercles of lepra; tubercles which never give forth discharge of any kind, and whose function is the production of scales of a white, porous, morbid epidermis, and not, as in psoriasis, the separation and exfoliation of an otherwise healthy cuticle. Again, by viewing lepra and psoriasis in their true light, we are enabled to understand how eczema may, by long continuance, merge into psoriasis, a most natural declension; but we are not able to comprehend this natural phenomenon, if psoriasis is to be considered as synonymous with lepra.

The lepra diffusa is sometimes very extensive, involving, for example, an entire limb, and with its great extent it presents so obstinate a character, as to have gained for itself the appellation *inveterata.* It is commonly termed psoriasis inveterata, but for reasons already given I think it more correct to name it *lepra inveterata;* the thickening of the skin in this severe form of the eruption is often so great as almost to obliterate the appearance of tubercles; and the formation of scales is often excessive.

The tubercles of lepra are an hypertrophy of the structure of the derma, and with this general hypertrophy it is not uncommon to find the papillæ very considerably enlarged. With hypertrophy of structure there is also an augmentation of function, hence the large accumulations of morbid epidermis which occur in this disease. If we examine the scales of lepra with attention, we find the epidermis of which they are composed to be whiter than natural, dry, porous, and friable, particularly at the circumference, while in the centre of the patches they are frequently dense and horny. If a scale be raised with care it will be found closely adherent to the skin at its central

part, and as this central portion is lifted up, it is found to be pitted into numerous foveolæ for the reception of the enlarged papillæ of the derma. The whiteness of leprosy is, therefore, due to an altered epidermis, and the degree of whiteness is referable to the greater or less degree of thickness of that structure; sometimes the whiteness is dull, at other times metallic and silvery, and always very remarkable. This character of lepra has gained for it the Greek appellation *Alphos;* and for the guttated variety the specific designation *alphoides.* Lepra is the *Boak* of the Hebrew writers, the *dull-white leprosy;* so called to distinguish it from the *Tsorat* or *Berat lebena*, the *Beras bejas* of the Arabians, the *Lepra leuce* of the Greeks, the *bright-white leprosy*, or true leprosy. It is of lepra that we read in the thirteenth chapter of Leviticus, that "if the leprosy have covered all his flesh, he (the priest) shall pronounce him clean that hath the plague: it is all turned *white.*"

The varieties of lepra are four principal, namely, guttata, circinata, diffusa, and inveterata; and four secondary, two of which are general, namely, nigricans and syphilitica, and two local, namely, lepra capitis and lepra unguium. In a tabular form they may be arranged as follows:

Lepra guttata vel alphoides,	Lepra nigricans,
" circinata vel vulgaris,	" syphilitica,
" diffusa,	" capitis,
" inveterata,	" unguium.

LEPRA GUTTATA.

Syn. *Lepra alphoides. Psoriasis guttata. Psoriasis discreta. Dartre furfuracée arrondie*, Alibert. *Weisse Aussatz*, Germ.

Lepra guttata[1] (Plate XII., c) occurs in the form of small convex and flattened scaly tubercles and spots, raised above the surface, and varying in dimensions from one-sixth of an inch to half an inch in diameter. In general aspect, the smaller spots resemble a number of drops of water sprinkled upon the skin. They are distributed over all parts of the body, particularly on the dorsal aspect of the limbs and trunk, and upon the scalp and face. The eruption commences by small, red, papular elevations or tubercles, upon the summit of each of which a small white scale is developed. The papulæ advance quickly in growth, and the scales become larger and better defined, being reproduced as frequently as they are removed. On the decline of the eruption, the affected skin retains a reddish and yellowish stain for one or two weeks. Sometimes the larger patches fade gradually from the centre towards the circumference, and assume the annular form presented by lepra vulgaris during its progress towards cure.

The eruption of lepra alphoides is rarely preceded by symptoms indicating constitutional disorder; if such symptoms occur, they are relieved by the outbreak of the eruption. The local symptoms, as in

[1] Portraits of Diseases of the Skin, Plate XV., AM, exhibits a good example of lepra guttata, under its old and improper name of psoriasis guttata.

lepra vulgaris, are a trifling degree of pruritus when the skin is heated, and at night.

LEPRA CIRCINATA VULGARIS.

Syn. *Lepra vulgaris. Dartre furfuracée arrondie. Herpes furfuraceus circinatus*, Alibert.

Lepra circinata[1] (Plate XII., A B) commences by small, smooth, and prominent spots of a dull red color, usually in the neighborhood of the knee and ankle joints in the lower extremities, and of the elbows and wrists in the upper limbs. In the course of a day or two from their first appearance, the spots are covered with thin, whitish scales. In three or four days they have increased in size, by the extension of their circumference, which is raised and red, while the central area loses a portion of its redness and becomes depressed, the whole patch being covered by a laminated scale of moderate thickness. After increasing gradually in this manner to a size varying from that of a four-penny piece to a half-crown, the eruption usually becomes stationary, excepting about the joints and upon the scalp, where the circles run into each other by their periphery, and form a continuous patch of large size. These large irregular patches are also produced occasionally in other situations. The scales of lepra are remarkable for their grayish white and silvery hue, being sometimes almost metallic in appearance. They are composed of thin lamellæ, which gradually increase in size from the centre to the circumference, so as to project beyond each other in an imbricated manner, a disposition which is marked on the surface of the scale by a series of concentric lines. When rubbed off by the attrition of dress, or thrown off spontaneously, they leave upon the skin a surface which is of a dull red color and smooth, in recent cases; and rough, papillated, and furrowed when the disease has existed for some time. After their fall, the thin crusts are speedily reproduced.

Lepra is rarely accompanied by constitutional symptoms, and is attended with very little local inconvenience, the latter not exceeding a slight degree of itching on getting warm in bed, or on exposure of the body to changes of temperature. When the patches are so extensive as almost or completely to surround a joint, they are productive of some degree of stiffness. The disease is slow in its march, and usually continues for years, sometimes for life, rarely getting well when left to itself.

The first patches of lepra appear about the knee or elbow-joint, and often symmetrically on the two limbs at the same time. Willan indicates a point immediately below the patella as the most frequent site of commencement of the disease. Extending from the knee, the patches appear in various points upon the leg, as far as the ankle. Willan has remarked, as a peculiarity of lepra, that it occurs in the situation of a superficial bone, as in the course of the tibia, of the crests of the iliac bones, &c., and less frequently on the muscular

[1] A good example of lepra circinata, under the name of lepra vulgaris, will be found among my Portraits of Diseases of the Skin, Plate XIII., T.

parts, as upon the calves of the legs. The patches also proceed upwards towards the trunk, invading in their turn the upper parts of the limbs and the trunk of the body. Sometimes the disease attacks the scalp, and occasionally the pubic region.

When lepra affects the scalp, it confines itself to the limit of the hair, extending for a short distance only upon the neighboring skin. In this situation the disease is highly inconvenient, exciting much pruritus, and producing an irritation which is increased by scratching, and followed by bleeding and crusts. Nearly the same inconveniences attend the affection when it pervades the pubic region, where, in the female, it is frequently accompanied with pruritus pudendi. When the ends of the fingers are the seat of lepra, the formation of the nails is disturbed; they are dry, thickened, irregular, and brittle; more or less separated from the matrix, and have a yellowish curdy matter deposited beneath them.

As the patches of lepra decline, the central portion of the area resumes its healthy state, and ceases to produce scales. By degrees, the scales upon the circumference of the patch become smaller and thinner, the prominence of the skin subsides, and the ring breaks at one or several points, the remains of the patches returning very slowly to the state of the neighboring skin. (Plate XII., D E F.)

LEPRA DIFFUSA.

Syn. *Psoriasis vulgaris.* *Psoriasis confluens*, Rayer. *Diffused dry tetter.*

In lepra diffusa[1] (Plate XII., H I) the patches are of large size, very irregular in their form, and of variable extent. The surface of the patch is of a dull red color, rough, and elevated above the surrounding skin, intersected by deep furrows, which correspond with those of the epidermis, and generally fissured by several chaps of considerable depth. The patches are surmounted by numerous thin scales of dried epidermis, which are continually exfoliating, and giving place to new and successive layers. The chaps are dry, and covered by thin epidermal scales; they frequently bleed, but very rarely pour forth any secretion. The patches are developed either by a number of small tubercles, which run together and form one continuously-affected surface; or by several small patches, which speedily increase in size, and coalesce. In either case the patches are two or three weeks before they attain their complete growth; and it frequently happens that the eruption assumes the character of small patches over the greater part of the body, and of large ones around the joints.

The eruption presents several degrees of intensity and extent; it may occur as a single patch of small or large size, or there may be several; it may appear upon all parts of the body, but some it would seem to select by preference. I have seen the eruption most frequently on the fore-arms, or about the elbow and wrist. The duration of lepra diffusa is always tedious; in milder cases it continues for several weeks

[1] Portraits of Diseases of the Skin, Plate XIV., V. Lepra diffusa is represented under the name of psoriasis vulgaris.

or months; while, in severer examples, it may be intractable for a much longer period.

LEPRA INVETERATA.

Lepra inveterata[1] (Plate XII., 1) is the most severe and obstinate of all the forms of scaly tetter, and may be regarded as an intense degree of lepra diffusa. It extends over a considerable surface, usually occupying the entire of the limbs, but sometimes spreading over the whole body, with the exception of the palms of the hands, the soles of the feet, and the face. The skin in this variety is thickened, congested, and hot, and there is more or less pruritus, which is increased and troublesome during the night. It is, moreover, dry, harsh, stiff, deeply fissured by cracks and chaps, and covered with epidermal scales, which are produced and thrown off in abundance. The harshness and thickening of the integument are sometimes so great as to interfere with the action of the muscles and movements of the joints. When the surface is abraded by pressure, by the violent use of the nails, or by any other cause, some bleeding takes place, which discolors the scaly surface.

In lepra inveterata of the scalp, the scales collect in great number; and when the nails are affected, they become yellow, thick, and irregular; they are subsequently thrown off, and replaced by shapeless crusts. The duration of lepra inveterata is indeterminate; it usually lasts for several years, and in old persons for life.

LEPRA NIGRICANS.

Syn. *Schwarze Aussatz*, Germ.

Lepra nigricans is a form sometimes assumed by lepra when it occurs in persons of a languid and debilitated constitution. The figure and distribution of the patches are the same as in common lepra, but they are not so large, and the central depression, which marks the commencement of a curative process, does not exist. The patches, instead of being of a dull red or brickdust color, are bluish and livid, and the scales thin, so that the lividity of the surface is seen through them. The scales are easily detached, leaving behind a tender and frequently an excoriated surface, from which a morbid serous fluid, often mixed with blood, is poured out. This secretion hardens by degrees into an irregular and friable crust. Lepra nigricans sometimes affects the scalp.

Willan observes, that "the lepra nigricans affects soldiers, sailors, scullermen, stage-coachmen, butchers, brewers, laborers, and others whose occupations are attended with much fatigue, and expose them to cold and damp, and to a precarious or improper mode of diet. Women habituated to poor living and constant hard labor are also liable to this disease.

LEPRA SYPHILITICA.—Lepra syphilitica will be treated of in the chapter on syphilitic eruptions.

[1] Portraits of Diseases of the Skin, Plate XVI., AO. Lepra inveterata is represented under the name of psoriasis inveterata.

LEPRA CAPITIS.—Among the special regions which lepra is apt to attack, is the scalp, where it creates much irritation and considerable inconvenience, from the accumulation of scales which is apt to ensue. It commonly extends over the entire scalp, and to a short distance beyond the margin of the hair, advancing sometimes a little way on the forehead, but it rarely proceeds far, and never invades the whole extent of the forehead or the face. The skin is thickened and red, often torn by the nails, and the scales are thinner, and smaller, and more furfuraceous in their character than on other parts of the body. Lepra capitis is usually accompanied with patches of eruption on other parts, and notably on the elbows and knees.

LEPRA UNGUIUM.—When lepra is general in its eruption, the nails are very apt to become the seat of the disease, and undergo, in consequence, a morbid alteration. At first there is an appearance of a white deposit beneath them; this deposit increases, and then they are separated from their matrix to a greater or less extent, and become thick and rugged. Their color also is changed; they are yellowish and tawny, are apt to curve down over the ends of the fingers, or become brittle, and are not unfrequently ragged and broken. Sometimes they are separated entirely from the matrix, and are cast off, to be replaced by others equally deformed and unsound.

DIAGNOSIS.—The pathognomonic characters of lepra are, the circular or circumscribed form of the patches, their elevated border and depressed centre, and their covering of well-defined scales. Their circularity of form is traceable by means of two or three broken arcs of circles, even when a number of disks have run together and formed one continuous patch of large size.

Lichen circumscriptus, with its circular clusters of pimples fading towards the centre, may sometimes be mistaken for lepra in process of cure, but the identity of lichen is established by the presence of a few marginal papulæ; whereas in lepra, the inflamed surface, denuded of its scales, is perfectly smooth.

Occasionally we meet with cases of chronic eczema and chronic lichen agrius, in circumscribed patches, in which it becomes very difficult to determine whether or not they belong to the leprous eruption. These are, in fact, the cases to which the designation *psoriasis* properly belongs; and careful examination generally determines their real nature, particularly if there be several such patches; but sometimes the disease occurs in the form of a solitary patch. If there be no eruption on the elbows and knees, a *primâ facie* case is made out against lepra; and this is confirmed if there be any moisture or discharge about the eruption. The crust may resemble exactly that of irregular lepra, lepra diffusa. The difficulty is increased when the lepra presents itself in an irregular form, and when it has become the seat of eczematous congestion, and pours out the peculiar ichorous secretion of the latter disease. The case is then one of lepra complicated with eczema.

CAUSES.—The cause of lepra is a special poison, the nature of which is obscure. I have stated my belief, and I see no reason to change

that opinion, that the leprous poison is in its essence and origin *syphilitic;* that lepra is, in fact, a manifestation of the syphilitic poison, after transmission through at least one, and probably through several generations. In examples of constitutional syphilis, we not unfrequently meet with cases in which the resemblance between the eruption and that of lepra is so exact, that we feel bound to accept the term which has been handed down to us by our predecessors, namely, lepra syphilitica; but lepra syphilitica differs from lepra vulgaris in this, that the former yields to the iodide of potassium and mercury; but the latter is unaffected by those remedies. Again, I have published one example, and seen several, of a real lepra vulgaris in the children of a man who was under my care for the remote effects of syphilis, and who appeared, besides, to have had congenital syphilis. These facts are worthy of observation, and will, at least, afford a clue to the probable discovery of the mysterious cause of this most mysterious and curious disease.

Lepra is hereditary; but, in some instances, it may be very difficult to determine its succession; and sometimes it appears to be idiopathic. When undoubtedly hereditary, it presents the curious phenomenon of attacking only one out of a large family, and this without any explanation being admissible; it is neither the strongest nor the weakest, the youngest or the eldest child that is afflicted. In few instances, comparatively, two children become the subjects of the disease where one of the parents suffers; and in a case now before me, I have a mother and two children all under treatment at the same time for the same eruption. Lepra is not common in childhood; but I have seen it between the fourth and fifth year; it is more frequent after puberty, but may be developed at any period of life, being rather a disease of mid-age than of either extreme.

The eruption often makes its appearance slowly and insidiously; beginning by a single small spot, which gradually enlarges, then other spots appear; very soon it is found on the elbows, and then a symmetrical arrangement is observable. Nerves from the same centre proceeding to opposite halves of the body, develop the same morbid action in the parts to which they are distributed. Sometimes the eruption makes its first appearance after an exciting cause, such as mental agitation, bodily fatigue, exposure to wet or cold; a severe illness, such as scarlet fever; or excess of any kind. The exciting cause is simply the spark which fires the pile, already long prepared, and only awaiting the power which is to give it life and activity.

Prognosis.—Lepra will often get well; sometimes spontaneously, sometimes under the influence of medicine; but lepra is more commonly a life-long disease. Generally it is periodical, making its outbreak in the autumn and winter, and getting well in the summer, when the skin is more active in its functions. At other times it is permanent, the only change being some variation under the influence of the seasons, or of the state of health of the person. I have a patient, a lady, the sister of an eminent physician, who comes to me once or twice a year for a little help for her troubles. She has had this vexatious complaint nearly fifty years. It began in her girlhood, and then

she was consoled by being told that it would cease at womanhood; when womanhood came, and the disease was still there, she was to look forward to change of life as her period of cure; now she requires no telling that the shroud alone will cure her complaint. I could multiply examples, if such were necessary. Lepra is not a disease on which to build a medical reputation.

TREATMENT.—Unlike diseases originating in general causes, lepra has no constitutional symptoms of its own, and its existence is perfectly consistent with a complete state of health of the individual. But as the leprous patient may suffer from other diseases, these are apt to constitute so many complications of lepra, and may require to be relieved before the special treatment is commenced, or at any rate consentaneously with it. One of the most common complications is that form of mal-assimilation which gives rise to the gouty and rheumatic diathesis, and this is apt to occasion an inflamed and painful state of the eruption, and must be removed before the real treatment of lepra is begun. It would be a mistake, however, to fail to distinguish between that which is an accidental superaddition to lepra and the disease itself. Not unfrequently, in the presence of the gouty diathesis, the leprous eruption is attacked with a violent erythema, and not uncommonly it throws out the ichorous exudation of eczema.

The treatment of lepra, therefore, presents two indications; *firstly*, the removal of complications, together with the regulation of the assimilative organs; *secondly*, the adoption of a course of specific remedies.

The complications of lepra call for the same treatment that they would receive independently of their connection with lepra; the treatment, in fact, which is laid down in the chapter on General Therapeutics and in that on Eczema; consisting of gentle aperients, salines, bitters with alkalies, bitters with the mineral acids, colchicum, &c. Occasionally the effects of this treatment are very remarkable. With the improvement in the general health, the lepra is always improved, and sometimes will get entirely well without specific remedies. The practitioner must not, however, in this event, rush to the conclusion that the remedies have cured the lepra, and will therefore cure it again. If he endeavor to put such an idea to the test of experiment, he will inevitably fail. The lepra, in his fortunate case, had reached its turning-point; it was no longer kept up by its own special cause, and was only prevented from healing spontaneously, as it not uncommonly does, by the constitutional disturbance then existing. The medical man allays the constitutional disturbance, and the lepra gets well, not by the virtues of his medicine, but spontaneously. It is the failure to see this fact in its true light that imports so many suggestions and remedies into the treatment of lepra, remedies which flourish for a week in the periodical in which they first appear, then probably languish for a year in some annual abstract of delusive cures, and then are forgotten forever, and deservedly so; not even leaving behind them the appreciation of that small, thin streak of truth upon which they were founded. A case of this kind happened to myself, which,

as it is illustrative of the treatment of lepra, I will narrate. A gentleman, the surgeon of a London hospital—of that great metropolis that has hospitals for every disease, real or presumed, but not a ward in all its magnificent hospitals for the instruction of students of medicine in cutaneous diseases—called me to see him during an attack of lepra, complicated with excessive debility and mal-assimilation. He had been humoring the fancy of a young medical friend, and had been bled somewhat largely, without any benefit, or other effect than that of contributing considerably to his weakness. He had suffered from lepra for many years; but latterly, in consequence of the gouty complications to which I have referred, his attacks have been more violent than usual. Finding him so prostrate, that he had already taken aperient medicine, and that his urine was moderately free from lithic acid, while his tongue was large, pale, and indented, I prescribed the nitro-muriatic acid with gentian, and, as a local remedy to relieve the excessive irritation of surface, the oxide of zinc ointment. At my next visit, I found my friend better; so much better, in fact, from his improved state of assimilation, that I did not think it necessary to see him again. At my first visit I impressed upon him the importance of having an ointment prepared of perfectly pure oxide of zinc; and, to insure perfection in this respect, he had, he informed me, had some sent to him from the hospital. I was curious to see what went by the name of oxide of zinc ointment in a London hospital, and found *stuff* only fit for the stuffing-boxes of railway carriages. It is thus that ointments fall into disrepute, and an opportunity is given to some thoughtless scion of "young physic" to exclaim "Down with ointments!" "Down with all greasy applications!" But to return to my narrative. A few weeks afterwards I was asked by several medical friends to communicate to them a discovery I had made in the cure of lepra, a remedy that was attended with unbounded success; neither alkali nor arsenic. I was a little confounded at first by this sudden appeal, but, after a few questions, discovered the source of the rumor, and remembered my always good friend, the nitro-muriatic acid and gentian.

As a specific in lepra there is but one reliable remedy, and that remedy is arsenic. In the chapter on General Therapeutics, I have already expatiated on the merits of arsenic, which, in judicious hands, is one of the best and safest remedies which we have in the pharmacopœia. Arsenic will cure lepra with certainty; but neither arsenic nor any other known medicine will prevent it from returning again; sometimes, after a thorough dispersion by arsenic, the eruption never reappears, but more frequently it recurs the following year, or after the lapse of several years.

The pharmacopœia is rich in arsenical preparations, but none exceeds in practical utility the liquor potassæ arsenitis, the solution of Fowler. The dose of this preparation is *five* minims, to be taken with meals three times a day. I frequently combine with it five minims of antimonial wine, and ten of tincture of ginger, making the dose of the mixture twenty drops. There is some advantage, in unsteady hands, in a mixture, of which a larger number than five drops is the

dose; and probably if the dose were increased to thirty drops, a still greater accuracy would be secured. When the dose is limited to a few drops, I order these to be instilled on a fragment of bread, the piece of medicated bread to be eaten in the course of the meal. By this means I secure the perfect mixture of the arsenical solution with the ingesta, and from the comparative tastelessness of the remedy, it is frequently preferred in this manner to any other; and to prevent still further any inconvenience from flavor, I sometimes order the omission of the tincture of lavender from the liquor arsenicalis. If preferred, the dose may be taken in a little water, or in any fluid drunk during meals, but I endeavor to impress on my patients the necessity of taking the medicine in the middle or towards the end of the meal. To take it on an empty stomach, or before a meal, would be to invite its bad effects; on a full stomach it rarely disagrees.

In certain exceptional cases there is a great intolerance of arsenic, even in smaller doses than five minims, and when those cases come before us, we must adapt our remedy to the idiosyncrasy of our patient. If five minims be too much, we must reduce the dose to four, three, or two. Sometimes I find it convenient to exhibit the medicine only twice a day, instead of three times; in a word, coax it in every possible way. And then, I never fail to give the patient instructions, that if the medicine disagree in any manner whatever, it is to be suspended for a day or more, and afterwards resumed as before. I add also to my instructions, that if the patient be out of health from any other cause than the medicine, such as common cold, &c., that then also the medicine should be omitted, lest the morbid symptoms in question should be aggravated by the arsenic, or lest indeed they may, unsuspectedly, have been promoted by it.

In the chapter on General Therapeutics I have already enumerated the various preparations of arsenic known to us, and the symptoms which are occasioned by the use of the medicine in excess, or in too large doses. I may, however, in this place, distinguish two or three from the number, which may be employed in relief of Fowler's solution, when this latter does not seem to agree with the stomach, or when for any reason a change of remedy is called for. Next to the arsenite of potash, I give a preference to the arseniate of soda, which may be administered in powder or pill. The dose of the arseniate of soda is the eighth of a grain three times a day, in combination with guaiacum, or with guaiacum and the oxysulphuret of antimony.[1] After the arseniate of soda I prefer the solution of arsenic in hydrochloric acid, the solutio solventis mineralis de Valangin, of which the dose is from five to ten minims. This solution is convenient for giving with meals, as it harmonizes with the gastric juice, and has appeared to me, in some instances, to agree with the stomach better than the alkaline solutions.

In very chronic cases of lepra, it may be found advantageous to combine mercury, and sometimes mercury and iodine with the arsenic; and to meet a case of this kind, we have the iodide of mer-

[1] See "Selection of Formulæ" in the last chapter.

cury, and the triple solution of Donovan, the liquor hydriodatis hydrargyri et arsenici. The dose of Donovan's solution is from ten to twenty minims three times a day with meals. The following is Donovan's formula for this preparation.[1] Triturate of finely levigated metallic arsenic, 6.08 grains; mercury, 15.38 grains; and of iodine, 50 grains, with one drachm of alcohol, until the mass be dry, and changed in its color from a deep brown to a pale red. Next, triturate the mass for a few moments with eight ounces of distilled water, transfer the solution to a bottle, add to it half a drachm of hydriodic acid, and filter, making it up to eight ounces by means of distilled water, if there be any deficiency. The solution is of a golden yellow color, and each drachm contains

Water,	℥j.
Protoxide of arsenic,	gr. $\frac{1}{8}$
Protoxide of mercury,	gr. $\frac{1}{4}$
Iodine, converted into hydriodic acid,	gr. $\frac{4}{5}$

Of the iodide of arsenic,[2] the dose is the tenth of a grain, and in no instance has it admitted of being carried beyond one-third of a grain. "Its obvious effects are, quickness and hardness of the pulse, with slight puffiness of the lower eyelids; but, generally, before these symptoms of its influence display themselves, the disease has begun to yield." "The symptoms which indicate a necessity for reducing the dose are, heat of the mouth and fauces, and anxiety at the præcordia, with pain at the epigastrium, or griping. If, besides these, there is tension, with an uneasy sensation of stiffness around the eyes, and erythema of the face, thirst, a white tongue with the edges and tip of a florid red hue, and a quick pulse, the use of the medicine should be suspended for some days. If nausea, cough, vertigo, or salivation, supervene, it should be left off altogether. The employment of any arsenical medicine is inadmissible, if it cause an uneasy sensation of the chest from the first. Iodide of arsenic is incompatible with cinchona in any form."[3]

Liquor potassæ and dilute nitric acid are among the remedies for lepra. The former may be taken in doses of from one to two drachms, two or three hours after a meal, three times a day, in any convenient vehicle, such as milk or beer, or in some medicinal infusion; and is not incompatible with the arsenical treatment. The dilute nitric acid is incompatible with the arsenical treatment, and may be adopted in those cases wherein the stomach evinces a great repugnance to arsenic. The dose is, one or two drachms in barley-water, sweetened with sugar, to be taken an hour before meals, twice or three times a day. I have usually combined with this treatment a Plummer's pill at bed-time.

Other remedies for lepra recommended from time to time by

[1] Dublin Journal of Medical Science, November, 1839, September, 1840.

[2] Dr. Anthony Todd Thomson's formula for the preparation of the iodide of arsenic is, to take "seventy-five grains and a half of metallic arsenic, and six hundred and thirty-one grains and a half of pure dry iodine; rub them well together in a mortar, and sublime. The salt is thus obtained in the form of brick-red shining scales."

[3] Commentaries on Diseases of the Skin, &c

different authors are, tar, tincture of cantharides, iodide of potassium, bichloride of mercury, and certain vegetable infusions or decoctions. In the presence of so excellent and certain a remedy as arsenic, it is difficult to find an opportunity for making trial of these medicines, and it is only where arsenic is found to disagree with the stomach, or as a change of remedy, that I should be induced to adopt them. I have prescribed the Barbadoes tar in capsules in some few cases, but have certainly not been impressed with its value; and many patients have come to me uncured after a long use of tar, who have had the eruption speedily removed by means of arsenic. The cantharides may be combined with Fowler's solution, where it may be thought desirable to employ it, as in those cases in which the kidneys appear to be torpid in their function; but the tendency of this medicine to produce inflammation of the kidneys must at the same time be borne in mind. The iodide of potassium and bichloride of mercury, can only be regarded and employed as supplementary remedies or adjuvantia.

The vegetable infusions and decoctions which have gained a reputation in lepra are simply to be regarded in the light of alterative diluents, diaphoretics, aperients, and diuretics; they are mild remedies, and require to be taken in considerable doses. As assistants to a more active treatment, and especially to the arsenical treatment, they may be found of value; but alone, I should attach very little importance to their use. The chief remedies of this kind are, the decoction of dulcamara; decoction of the woods, namely, guaiacum, sassafras, and mezereum; decoction of the arctium lappa or lesser burdock; decoction of elm bark; infusion of the urtica dioica, or common nettle; and infusion of the galium aparine or goose-grass. The decoctum bardanæ or decoction of the lesser burdock, is made by macerating an ounce of the root in twelve ounces of water, and then boiling it with a slow heat down to eight ounces. This quantity to be the daily dose.

Local treatment for the cure of lepra is useless; but various indications present themselves which render local treatment for the relief of irritation of the skin advantageous and necessary. An erythematous or eczematous state of the eruption, or a cracked and fissured state of the skin, will call for the use of the oxide of zinc ointment, with spirits of wine or glycerine. Where the scales cover a large extent of the surface of the body, a tepid soap bath or vapor bath is indicated, and is a source of much comfort. Various remedies are found to give relief by occasioning exfoliation of the scales, such as a lotion of bichloride of mercury; an ointment of carbonate of potash, of iodide of potassium, the white precipitate ointment, the concrete naphthaline ointment (℥j ad ℥j), or tar ointment. For a dry and parched state of the eruption the best application is a lotion of equal parts of distilled glycerine and rose-water.

For the accumulation of sordes and scales which takes place in lepra capitis, the best application is the unguentum hydrargyri ammoniochloridi; and for the dry, horny, rugged, and loosened nails of lepra unguium, steeping them in glycerine.

But I must repeat, the local treatment of lepra is not to be regarded as curative, it is simply palliative; the cure must come from within,

from that improved and altered state of the blood which results from the proper administration of arsenic.

LUPUS.

The term LUPUS, or wolf, applied to a disease, is suggestive of destructiveness, and doubtless took its origin in a form of cutaneous affection which is remarkable for its destructive nature, namely, *lupus exedens*, called also, and for the same reason, *lupus vorax*. Destruction, then, we may take as the leading character of lupus. A further inquiry into the nature of lupus served, however, to show that this destructive disease was preceded by a circumscribed thickening and prominence of the skin, commonly termed a *tubercle*, hence, lupus is considered as a tuberculous affection of the skin, and is placed in the order *tubercula* of Willan. Now, the destructive action implied by the term lupus, was, in the first instance, intended to be restricted to that form of tubercle which commonly issues in destructive ulceration; but as cutaneous diseases came to be more carefully observed, it was perceived that there existed a kind of tubercle which did not of a necessity ulcerate, which was chronic and lasting in its nature, and which, when it disappeared, under treatment or spontaneously, left behind it a deep pit or a strongly marked cicatrix; this tubercle resembling the tubercle of the ulcerating lupus in many of its features, and being unlike all other forms of cutaneous disease, came therefore to be grouped under the head of lupus, being distinguished from the preceding by the specific appellation of *lupus non exedens*, or non-ulcerating lupus. Destruction by ulceration and destruction without ulceration are, therefore, the established characters of lupus. Now, experience has made us acquainted with a third form of disease, in which there is also destruction or atrophy of the superficial structure of the skin, but no ulceration and no tuberculous thickening; the only other outward sign of the disease besides the atrophy being erythema. This form of cutaneous disease has also been taken into the group of which lupus is the head, and has been distinguished by Cazenave under the name of *lupus erythematosus*. I myself have noted this latter affection, independently of the researches of Cazenave, and finding it arise in some instances from syphilis, have described it under the name of syphiloderma erythematosum hæreditarium.[1] In other cases the syphilitic origin of the disease is not so clear, and in a few examples I have been led to regard it as a remnant of elephantiasis; hence, for the present at least, I prefer to leave the question of cause unsettled, and the affection itself in the present group.

The varieties of lupus are, therefore, three in number, namely, *lupus erythematosus*, *lupus non exedens*, and *lupus exedens*.

[1] On Syphilis, constitutional and hereditary, and on Syphilitic Eruptions, 1852.

LUPUS ERYTHEMATOSUS.

Syn. *Syphiloderma erythematosum hæreditarium faciei et capitis*, Wilson. *Erythema centrifugum*, Biett.

Lupus erythematosus occurs upon the face and head, principally on the nose and cheeks, in women, and sometimes in men. It makes its appearance in patches of irregular form and small size, generally single, but often two or three in number; the patches are marked by erythema, the redness being greater near the circumference than within the area of the patch; sometimes at the extreme edge the redness subsides by degrees into the tint of the surrounding skin; at other times the patch is bounded by a slightly-raised, wheal-like border. In recent cases the wheal may have a delicate purple-red hue, the central area being whitish and opaque; in older cases the redness of the area is more confirmed. The area of the patch is always depressed, apparently from exhausted nutrition; the skin looks dry and shrunken, as if its vitality were affected; the cuticle is yellow and horny; the sebiferous pores are distended with dry epithelial exuviæ, the sebiparous glands appear to be in a state of atrophy; and the term *atrophied* seems applicable to the whole of the affected skin; it looks as if a fire had passed over it, parched and seared.

The patches of skin affected with this disease are manifestly thinner than natural from interstitial absorption; if they occur among the hair, the hair follicles are obliterated, and the hair is permanently lost; if they occur upon the nose, the bones and cartilages become unnaturally prominent, and after a time the skin has the appearance of a cicatrix. When the disease gets well a permanent cicatrix is frequently left behind; at other times, when treatment has been adopted early, the skin may regain its normal thickness and appearance.

The disease often begins in a very insidious manner, as in a young lady now before me, aged seventeen; a small pale spot, the size of a split pea, made its appearance on the centre of the cheek four months back; it attracted her attention suddenly, it gave her no pain, caused no irritation whatever, but was obvious to the eye as a pale, flat, dry spot, perfectly smooth, and surrounded with a delicate purplish halo, abrupt towards the spot, fading into the surrounding skin, and perceptible rather by its contrast with the pale spot, than from any distinction between it and the general tint of the cheek. Now, it has increased to the size of a shilling, by the formation around it of other spots of a similar character to the first; and the collective patch presents a scalloped edge, marking the outer boundary of six primary spots; while at the upper part, a seventh spot has formed just outside the boundary of the existing patch. How slight a matter it looks! and yet this apparently trifling thing will defy treatment, and possibly may increase so as to be unsightly; or other patches of a similar kind may form. At present it hardly seems a thing for medical attention or treatment, and possibly would not attract the

notice of any but the immediate members of the young lady's family, or a medical man who had directed his attention especially to such affections. For what is it? a small pale spot with a scalloped edge, a narrow halo of a delicate purple, like a blush of breaking day; and then the unchanged tint of the virgin cheek. How ridiculous it seems to look ominously at such a trifle, and to wish that it were something else of an infinitely worse appearance, in place of what experience tells us that it is.

Lupus erythematosus of the face is frequently accompanied with a similar affection of the fingers, particularly in young women. The erythematous spots or blotches are usually of a circular figure, of a purplish red color, and slightly raised above the level of the surrounding skin. They vary in size from two or three lines to an inch in diameter, and gradually become depressed in the centre; the cuticle in the centre assumes a whitish, opaque appearance; gradually dries up into a thin, yellowish and horny layer, and desquamates from time to time. A common situation of these blotches is the joints, and they are generally mistaken for chilblains, until their obstinate persistence and their occurrence in the summer as well as the winter season render this diagnosis doubtful. They are generally associated with coldness of the fingers and hands, which gives a color to the suspicion of their being chilblains. Like the similar affection of the skin of the face, the special character of the disease is atrophy; and in a young girl now under my treatment, the atrophy has extended to the whole of one finger, which is conical towards the end from loss of substance and contraction of the skin, and bloodless from the tight clasp of the skin upon the phalanges.

LUPUS NON EXEDENS.

Syn. *Vitiligo. Leuce.*

Lupus non exedens[1] (Plate XIII.) makes its appearance in the form of one or more elevations of a circular or oval shape, slightly raised above the surface, and about two lines in diameter. The tubercles are of a dull red hue, or salmon-colored, and semi-transparent; and not unfrequently they resemble a reddish transparent jelly effused upon the skin, and streaked with the ramifications of a few small bloodvessels. When pressed under the finger they are found to be soft, and when the finger is removed, they are blanched and flattened. The epidermis covering the tubercles is, at the beginning of the disease, smooth, but later, it cracks and peels off, and its white and broken margins are apparent around the circumference of the elevations. When more than one tubercle exists, they are usually found clustered together, and generally assume an annular disposition. The more common seat of this disease is the face, and more particularly the nose. I have also seen it on the lower eyelid, beneath the chin, on the lobe of the ear, and on the arm and leg.

The tubercles of lupus give rise to little or no inconvenience

[1] Portraits of Diseases of the Skin, Plate XLV., AC.

beyond their appearance, and may exist for months without undergoing any change. Occasionally they are scratched, and then a thin scale forms upon their summit. Then this scale is torn off, and another is produced; each successive scale being larger than the preceding, and being the cause of a repetition of the act of scratching. After a variable period of time, more tubercles begin to be apparent around the borders of the original patch. Perhaps, this second crop assumes an annular form, and the primary tubercles have subsided and disappeared. The process by which subsidence and disappearance of the tubercles is effected seems to be one of absorption. There is no ulceration, and yet the tubercles leave cicatrized pits behind them. Sometimes the disease spreads superficially and more quickly over the skin, and then the surface which it has left is crossed by white scar-like ridges and bands. Every trace of the normal structure of the skin has disappeared; it has slightly sunk below the level of the surrounding integument, and the spaces between the white lines are pale, salmon-colored, and semi-transparent, the epidermis being smooth, thin, and glossy. Occasionally fresh tubercles spring up on this surface, and the disease is perpetuated. Sometimes I have seen the patches covered by thick crusts from the oozing of an ichorous fluid following the abrasion of the skin.

When the disease has subsided, the skin never resumes its original appearance, even where there are no cicatrices. The epidermis is very thin, the linear marking of the skin is lost, and it looks flabby and loose. Moreover, the natural sensibility of the skin is also destroyed, a change which may be perceived from the first appearance of the disease.

When the tubercles attack the border of the ala of the nose their absorption causes a loss of substance of that organ, and gives to the external aperture a notched and irregular outline. When this change occurs towards the anterior extremity, the point of the nose becomes unnaturally acute.

There are fragments of Bateman's description of vitiligo which are peculiarly applicable to lupus non exedens; and I am disposed to believe that it was this disease which he had in view in writing his description. For example, referring to the tubercles, he remarks: "As they gradually subside to the level of the surface, they creep along in one direction, as for example, across the face, or along the limbs, checkering the whole superficies with a veal-skin appearance." The veal-skin appearance relates to the inside of the skin of the animal, an explanation without which the text is hardly intelligible. To the above comparison Bateman adds, "this white and glistening appearance, bearing some resemblance to the flesh of calves (vituli), seems to have given rise to the generic term." Again, he observes, in reference to the state of the skin, "a smooth shining surface, as if polished, being left, and a morbid whiteness remaining through life. The eruption never goes on to ulceration." Now, all this corresponds perfectly with the appearance of the area of a circular patch of lupus non exedens, or with the skin on which its devastations have been committed.

LUPUS EXEDENS.

Syn. *Herpes exedens; Herpes esthiomenes; Noli me tangere; Dartre rougeante; Esthiomene serpigineuse*, Alibert.

Lupus exedens[1] commences, like the preceding, by a tubercle of a dull red color, but harder and denser in structure than those above described, and not transparent. The more frequent seat of the tubercle is the nose, either the ala or tip, and sometimes the border of the ala or the columna. After a variable period of time, during which the tubercle remains indolent, a thin brown and adherent scab forms upon its summit. This scab is usually scratched off, and another is produced in its place by the desiccation of an ichorous fluid which escapes from the abraded tubercle. On the removal of this latter scab, the skin beneath is found more or less deeply ulcerated, and the ulcer soon becomes concealed by another and a larger scab, resulting from the drying up of the ichorous and purulent secretion which is poured out on its surface.

The ulcer, like the original tubercle, offers much difference in respect of rapidity of progress, being one while very slow, and another while very speedy, in its devastating course. When the latter tendency exists, the entire nose has been destroyed in less than a month; a character which is distinguished by the name of *lupus vorax*. The surface of the ulcer of lupus exedens is uneven, sometimes studded with unhealthy granulations, but more frequently covered with white patches of lymph. Its edges are thickened and red, and it frequently pours forth a considerable quantity of a fetid, ichorous, and semi-purulent fluid.

When the ulcer of lupus exedens heals, the cicatrix is remarkable for the white and corrugated bands, and the unhealthy-looking skin described in connection with the previous disease; and the recurrence of the morbid action on these cicatrized spots is far from being uncommon.

The deformity which results from this disease is sometimes quite distressing. I have now before me a lady about thirty years of age, in whom the eruption has crept from each cheek across the face, destroying the nose completely, and producing so great an amount of contraction, as to draw the lower eyelids down upon the cheeks; and shorten the upper lip, so as to denude permanently the gums of the upper jaw. The lower segment of the eyeballs is completely exposed, and the conjunctiva congested from the irritation of the atmosphere; the situation of the nostrils is marked by two round apertures of small size; the gums of the upper jaw are coated with sordes, and have retreated from the teeth, leaving them unnaturally elongated. On the cheeks and extending from the temples downwards to near the border of the lower jaw, the superficial ulceration continues, and over this has formed a very thick yellowish and blackish crust, which is broken into angular fragments of irregular form and size.

Lupus exedens sometimes attacks the interior of the nose, and a

[1] Portraits of Diseases of the Skin, Plates XLVI., XLVII., E, F.

fetid discharge precedes the extension of the disease outwardly; it occasions much swelling. The disease also makes its appearance at the angle of the mouth, or upon the upper lip, and sometimes on the cheek; and in these situations causes considerable tumefaction, with redness of the surrounding skin.

Lupus exedens is occasionally met with as a superficial phagedænic ulceration of the skin. Such a case I have now under my treatment; it is remarkable for its perfectly circular figure. Now and then it appears in the annular form, leaving a circular island of unaffected skin. When its tendency is to proceed inwards to the deeper tissues, the devastation which it occasions is often frightful; all the structures in its course, including even the bones, are destroyed; the nares are laid open, the superior maxillary bones are necrosed, and the eyeballs, losing their support, sink into the chasm which the removal of the subjacent parts occasions. And all this without producing much pain, for the ulcers of lupus exedens, like their tubercles, are remarkable for deficiency of sensibility.

Diagnosis.—Lupus is easily distinguished from other affections of the skin. Its dull-red indolent tubercles, in the first instance; their incrustation or ulceration subsequently; and then the unhealthy-looking or deeply-pitted cicatrix, are pathognomonic characters. To these may be added, its seat; the nose, lips, eyelids, and neck, being its more common situations. Rayer observes, that "the solitary tubercles of lupus exedens of the cheeks have frequently been mistaken during their stationary period for small sanguineous tumors or nævi." I have seen the tubercles of lupus non exedens present precisely this character.

Causes.—Lupus seems to depend upon a scrofulous taint of constitution; I believe hereditary syphilitic taint would be the more correct expression. It is more common in women than in men, and in the lower than in the middle and higher classes of society.

Prognosis.—Uncertain and unsatisfactory; the disease is always tedious, lasting for years or for life, and resisting often the best planned treatment. The indolent form is more favorable than the active kind.

Treatment.—The treatment of lupus, whatever form it may assume, presents two indications; *firstly*, to remove the local disease; and *secondly*, by alterative tonic remedies, to improve the general state of health, and, if possible, act specifically upon the skin.

For the *lupus erythematosus* I have found the liquor plumbi diacetatis, pencilled on the part night and morning, a good remedy, as also an iodide of lead ointment containing two parts of the salt to one of lard. Other local remedies applicable to this case are the oxide of zinc ointment, alone or in combination with glycerine, and the ointments of nitric oxide, and nitrate of mercury. As a constitutional remedy after regulating the system by general means, I give the preference to the liquor hydriodatis hydrargyri et arsenici, in doses of ten or fifteen drops with meals three times a day, and accompanied with the cod-liver oil, in doses varying from one drachm to an ounce, taken directly

after meals, twice or three times a day. Cazenave recommends sudorifics internally, particularly guaiacum; and, locally, tar ointment, or the iodide of mercury combined with olive-oil, in the proportion of half a drachm to the ounce; to be pencilled on the eruption daily or every other day.

For *lupus non exedens* the same constitutional treatment may be pursued as for the preceding; varying Donovan's solution with Fowler's or De Valangin's solution, and with the protioduret of mercury. Locally the tubercles may be destroyed by the chloride of zinc, nitric acid, or potassa fusa; taking a few tubercles at a time, and prosecuting their destruction until all are removed. In cases where the tubercle is single or occupies a small extent of surface, removal by these means is generally successful.

In *lupus exedens* the constitutional remedies and mode of treatment are the same as for lupus non, adding the bichloride of mercury, which is sometimes of great service. The local treatment must consist of caustics, which destroy the surface of the ulcer, and excite a new and more healthy action. The caustics the best suited for this purpose are, the strong nitric acid, the potassa fusa, or the chloride of zinc. The nitric acid is to be made into a moist paste with the sulphur precipitatum of the pharmacopœia, and applied by means of a small wooden spatula. The potassa fusa may either be used to touch the surface of the ulcer, or made into a paste with quicklime; and the chloride of zinc may be made into a paste, with the addition of two or three parts of flour to one of zinc. The Vienna paste, which is sometimes employed for this purpose, is composed of equal parts of potassa cum calce and quicklime, mixed to a proper consistence with spirits of wine. An arsenical paste, consisting of equal parts of arsenic and animal charcoal, has also been recommended; and an arsenical powder, bearing the name of Dupuytren, composed of one part of arsenic mixed with two hundred parts of calomel. The chloride of gold and acid nitrate of mercury have also been mentioned as suitable caustic applications. The nitric acid paste may be left to dry on the part; the Vienna paste takes from ten to twenty minutes to produce its proper degree of effect, and frequently requires to be guarded from contact with surrounding parts by means of a piece of plaster; and the chloride of zinc paste may be allowed to remain undisturbed for from four to eight hours. The arsenical caustics are dangerous from liability to absorption of the mineral poison.

After the caustic has been on for some hours, or when removed, the ulceration may be treated with water-dressing, either with oiled silk or with Alison's prepared lambskin, or with a dressing of the benzoated ointment of oxide of zinc, or liquor plumbi, or calamine ointment.

M. Lemery, of St. Louis' Hospital, finding the ordinary remedies for lupus so little successful, had recourse to cod-liver oil, of which he speaks in the most encouraging terms. He begins with the dose of an ounce three times a day, increasing the quantity for fifteen days, by which time he reaches six ounces a dose. If the disease exhibit no indication of submission, he goes on till he arrives at two pints in the day. Should the stomach revolt, a glass or two of seltzer-water is

given; and if any symptoms of derangement of the alimentary canal or fever supervene, the oil is suspended, but commenced again at the minimum dose as soon as the symptoms disappear.[1]

M. Devergie, M. Lemery's colleague in St. Louis, states that M. Lemery has over-estimated the benefits of cod-liver oil, but that in the serpiginous form of the disease, before ulceration has commenced, he has undoubtedly found it of service. He mentions the iodide of iron with favor; and, as an application to the ulceration, the oil of juniper applied every fourth day. The tubercles he treats with caustic.[2]

SCROFULODERMA.

Cutaneous scrofula presents itself to our notice in two forms, namely, that of *tubercles*, and that of *ulcers*.

SCROFULOUS TUBERCLES are of small size, indolent, of a purplish or livid color; they soften internally, open and give exit to an imperfect pus, often remain open or fistulous for a considerable time; and when at last they finally disappear, frequently leave behind them a hard knot in the skin. They are most commonly met with on the neck and face, and in the neighborhood of ulcers or the remains of ulcers resulting from inflammation of the lymphatic glands. These tubercles increase so slowly in size, that they are often several months before they attain maturity, and, if of any bulk, are apt to open at several points, the result of softening of separate parts of their structure; and when these openings take place successively, the tubercles continue in a fistulous state for many months longer. When the softened contents of the tubercle have been partially discharged, that which remains forms a crust over the aperture, and when the crust is from time to time disturbed or displaced, a fresh exit of ill-formed pus or ichorous fluid takes place, and the opening continues for an indefinite time, without showing any disposition to heal. When the healing is at last accomplished, an ugly scar or cicatrix is often left behind.

SCROFULOUS ULCERS may be the result of cutaneous or subcutaneous abscesses, and may vary considerably in their depth; like the tubercles already described, they are extremely indolent, their edges are purplish and livid; they throw up no granulations, or, if any appear, they are of a flabby and unhealthy character; they emit an ichorous, almost colorless discharge; are often fistulous, and either resist healing altogether, or heal slowly and imperfectly, leaving behind them a livid or purplish scar of irregular form and puckered and rugged surface. Scrofulous ulcers are most commonly met with in the neck, near enlarged lymphatic glands, and in the neighborhood of joints.

In scrofulous subjects, particularly in young persons, it is not uncommon to find an inflammation of the matrix of the nail, *scrofuloderma ungueale*. The disease begins by inflammation and swelling of the skin immediately around the edges of the nail, the extremity of the finger swells considerably, and becomes vividly red; and the

[1] Revue Medico-Chirurgicale, vol. iv. [2] Bulletin Thérapeutique, 1848.

scrofulous hypertrophy frequently extends to the whole of the tissues of the part, even to the bone, producing a *clubbed* finger. The nail, after a time, becomes separated, and leaves an angry-looking raw surface, upon which a rugged, ill-formed, and imperfect nail is from time to time produced. The denuded derma, covered with fungous granulations, secretes more or less of an unhealthy pus, and the disease is kept up for a considerable length of time, often for many months.

With these manifestations of scrofula in the skin, it is common to meet with other indications of the existence of constitutional scrofula in other parts of the system, such as enlarged glands, enlargement of joints, swelling of the upper lip, accompanied with a chapped and fissured state of the skin, and indolent abscesses.

Scrofulus tubercles commonly occur singly, sometimes a group of three or four appear in close proximity, and sometimes the morbid action spreads in an annular form upon the surrounding integument, leaving an area of thin, shining skin, of a livid or purplish color. I have met with rings of this kind, chiefly on the back of the hands and feet, where they are peculiarly intractable. The tubercles are disposed in an irregular manner around the circumference of the ring, and often only along a segment of the circle; they become more or less blended together, and they present in a mass the characters which have been described as belonging to individual tubercles. They are covered more or less completely with yellowish or dark-colored adherent crusts; and when these crusts are removed, the surface looks wormeaten and papillated, and the small ulcerated hollows are filled with an unhealthy-looking pus.

The TREATMENT of scrofulous tubercles and scrofulous ulcers calls for judicious constitutional management, as well as local remedies. The four great hygienic principles, air, exercise, temperature, and diet, all require regulation. The diet of scrofulous persons should be generous, embracing as much meat as possible, and a fair proportion of stimulus; while appetite and digestion should be promoted by air, exercise, and a genial atmosphere. The medicinal remedies are, the whole family of tonics, including iron, iodine, and cod-liver oil; and the local remedies, mild stimulants. The tubercles may be destroyed by nitric acid or chloride of zinc, and afterwards dressed with some mild digestive ointment, such as the unguentum elemi or unguentum balsami peruviani; or with a soothing and healing ointment, such as that of the benzoated oxide of zinc. Scrofulous ulcers also require a digestive and moderately stimulant treatment, and are generally greatly benefited by pressure, as by a dressing of adhesive straps, and, where the part will admit it, by the application of a bandage. For the scrofuloderma ungueale, nothing answers so well as the benzoated ointment of oxide of zinc, either alone or in combination with Peruvian balsam.

At the recommendation of Mr. Peter Price, I have employed the iodide of ammonium with advantage, using it at the same time internally and externally. For internal exhibition the dose is two or three grains, twice or three times a day, in any suitable vehicle, such as the compound fluid extract of sarsaparilla, or syrup of orange-peel.

And for external use a convenient formula is one drachm of the salt dissolved in an ounce of glycerine, and applied with a camel's hair brush to the enlarged glands night and morning.

KELIS.

Kelis, like lepra and lupus, probably originates in a specific poison existing in the blood, the nature of the poison being obscure and unknown. The disease makes its appearance in the form of an elevated thickening of the skin or tubercle, increases in dimensions, and when two or three tubercles occur, they are apt to become blended and form an elevated and flattened mass, often of considerable size. Sometimes the tubercle or tumor is isolated and single; more frequently there are several, and sometimes they are sprinkled numerously over the skin. When their development is complete, they remain stationary for years, and sometimes subside and disappear; they may attack either the deep or the superficial stratum of the derma, and appear to select for their pathological seat the fibrous element of the skin. When the deep portion of the corium is the seat of the hypertrophous growth, the surface of the skin is little affected; but when the disease invades the superficial stratum of the derma, the papillary layer of the skin is absorbed, the blood of the capillaries is driven back upon the larger branches of arteries and veins, and the white fibrous structure of the corium is seen through the soft, velvety, and semi-transparent layer which constitutes the surface.. The tubercles of kelis have no tendency to ulceration, and rarely terminate by absorption.

Kelis admits of a division into two kinds, according to its seat of origin, in the sound skin, or in a cicatrix left by some previous injury to the skin, such as a burn or ulcer. In the former situation it is termed the true kelis, *kelis vera;* in the latter, *kelis spuria.*

KELIS VERA.

Syn. *Kelois. Chelois. Cancrois. Keloides. Kelis vera; genuina; ovalis; radiciformis; cylindracea; clavata. Dartre de la graisse. Der Knollenkrebs*, Germ.

The disease of the skin termed *kelis*, was first particularly described by Alibert, who distinguished it by the name of "cancroide;" assigning as his reason for selecting that term the judicious practice of early observers, of designating diseases by the names of the things which they most nearly resembled. The word "cancroide" is therefore intended to draw the attention to a supposed resemblance in form between this disease and a crab, and is synonymous with "cheloide," derived from χηλὴ, forceps cancrorum, the term used by Rayer and Gibert, by reason, remarks the latter, of the likeness which the prolongations of the tumor bear to the feet of the crab. Another name given to this affection, and one which I regard as most correct, and have therefore adopted, is kelis, derived from χηλὶς, macula, vel probrum; this term having reference to the singularly cicatrix-like appearance which the disease so frequently presents.

Besides the preceding, Alibert had another reason for employing the term "cancroide"—namely, that of associating this disease with cancer. The cancroids, he observes, maintain a relation both with tetters and cancers; like the latter, they often give rise to acute, pungent, and lancinating pains; and he asks, "Will they form an intermediate genus?" This is a more important question than that of the etymology of the disease.

It is quite true that in many of their features the keloids have a remarkable resemblance to cancer, for example, in their hardness, whiteness, the meandering of small veins on their surface, the total disorganization of the skin, their extension into the deeper parts of the skin by root-like prolongations, and, above all, in the acute, burning, smarting, and lancinating pain with which they are frequently attended. On the other hand, it must be admitted, that they rarely, if ever, pass spontaneously into a state of ulceration; they have none of the large and tortuous veins which surround a cancerous tumor, the adjacent skin is wholly unaffected, the lymphatic glands are not implicated, the tumors are extremely slow in their progress, often stationary for years, and sometimes they disappear entirely.

Cazenave and Schedel remark, that the kelis should be "carefully distinguished from cancerous affections, with which, in truth, it has very little analogy." Rayer says, that "keloid formations do not seem to have any deleterious influence on the general health." Dr. Warren calls it a "troublesome and dangerous disease." Troublesome it is certainly, but I do not consider it dangerous; and I am of opinion that the case upon which Dr. Warren founds his inference of the danger of kelis was not an instance of this disease, but one of cancer. He states that it affected the ala of the nose; that, after several extirpations, "a considerable tumor appeared on the face, and another under the jaw," while, a fortnight after, "a tumor is seen extending from the right eye and side of the nose to the cheek, where there is a frightful enlargement, including all the textures of the face and gums."

According to the admission of all writers on the subject, the disease is rare; so much so, that the total number of cases which I have succeeded in finding recorded, amounts only to twenty-four; whereof twelve are reported by Alibert, five by Rayer, three by Biett, two by Gibert, one by Dr. Warren,[1] and one by Dr. Peace. To this number I may add seven that have occurred in my own practice.[2]

Of the twelve cases reported by Alibert, eight occurred in women. From this circumstance he was led to deduce the inference, that the disease was more common in females than in males. Five out of my seven cases, on the contrary, were males; while four out of the five mentioned by Rayer were also males. Of the entire twenty-seven, the sex is unmentioned in three; and of the remainder, fourteen were females and ten males.

The *cause* of kelis must evidently be sought for among those con-

[1] The second case reported by Dr. Warren appears to me to be an instance of carcinomatous disease rather than of Kelis.

[2] Subsequent experience enables me to estimate the proportion of cases of kelis to other cutaneous affections at about one in two hundred.

ditions of the constitution, whatever they may be, which give rise to lupus and cancer. In five of my seven cases there existed no known cause, and the same may be said of the majority of the examples reported by other authors. In four only of the twenty-seven cases is anything like a remote cause established, and that of so trivial a nature as to be obviously inadequate to the production of so grave a disease. In one of Rayer's cases, the tumor sprang from the cicatrix of a burn received in childhood; in another, it arose from the cicatrices of small-pox; and in a third, from the cicatrix of a small punctured wound; while, in one of Alibert's cases, the remote cause was a slight scratch. Of the two instances in which I was enabled to trace the growth to a cause, I found one to result from the application of irritating substances to the skin; and the other to originate on the seat of application of a blister. From this circumstance I felt inclined to classify these two cases with others which are seen more frequently, and which are termed "false kelis." These latter may always be traced to some local alteration of the skin, such as a cicatrix.

With the exception of one of Alibert's cases, I find no reference made to any hereditary disposition to carcinomatous disease; in the instance in question, a sister of the patient died of cancer uteri. The mother of one of my patients died, he informs me, of a similar disease, but I can trace nothing of the kind in the families of the other patients.

The similarity of position of the morbid growth in the greater number of the recorded examples of this disease is very remarkable. In three of my cases the tumor occupied the centre of the sternum; while, of twenty-two cases (of the before-mentioned twenty-four) in which the seat of the disease is stated, thirteen were situated on the same spot.

A matter of the first importance in a practical point of view, is the degree of annoyance which these tumors are calculated to give to our patients. Alibert observes that they are the torment of existence, that they are usually attended with increased heat, that they are often accompanied with itching and pricking to an extent that is insupportable, that the pain is acute, pungent, and lancinating, and like the piercing of the skin with burning needles. That often the pain extends to surrounding parts, and occasionally there is as it were a dragging from within. On the other hand, they are sometimes indolent, and merely give rise to stiffness of the skin. The cases seen by Rayer appear to have been of the milder kind referred to by Alibert; he remarks, that, at their commencement, they are mere points, and these points are affected with "pruritus of a pretty severe description." When they increase to the size of a "small hazel-nut or the barrel of a quill," they are generally indolent, "unaffected with morbid heat or pain," and very seldom, indeed, the seat of "anything like painful shooting sensations." Further, he says, that the inconvenience they occasion is, in general, so trifling, that he has known patients "refuse to submit to the curative means proposed for their relief." Cazenave and Schedel state, that the little tumors arise and grow without pain; in other respects, these authors follow the

description of symptoms given by Alibert. Dr. Warren mentions a case which was accompanied with a "stinging, burning pain." In Dr. Peace's case the tumor originated without pain, but, after eighteen months' growth, was so painful as to prevent the patient from lying on the affected side.

In a good example of kelis illustrated in my "Portraits,"[1] the patient was a robust man, forty-eight years of age. The disease first attracted his attention about seven years before his application to me. He then perceived upon the middle of the breast four slightly-raised tubercles, which coalesced, and gradually increased in size, until they formed a broad-spreading, irregularly-shaped excrescence. In figure this excrescence bore some resemblance to a bird, the head of the bird pointing towards the right breast, the wings spreading out above and below, and the body and broad tail crossing the sternum to the left breast. The length of the kelis, from the head-like process to the opposite extremity, was three inches and three-quarters, while, across the wings, at its broadest part, it measured three inches. Its elevation from the surface of the skin varied between two and three lines, the most elevated part being at its border.

On a first inspection, the morbid excrescence had the appearance of the cicatrix of a burn, and, upon closer examination, the only character at variance with that idea was its elevation from the surrounding skin, particularly at its borders. Its color was pink, lighter in the centre than at the circumference, and it was marked on the surface by a coarse network of prominent white lines or ridges. The general direction of these white lines corresponded with that of the long diameter of the kelis, but, upon the four processes of the excrescence they had a transverse or semicircular direction. From these processes a number of red and white lines were given off, which resembled roots shooting into the substance of the unaffected skin.

It was also evident, from an examination of the kelis, that its growth proceeded by an extension of the margins of the four processes only, while the intermediate portions of its border, namely, those forming the angles between the processes, were drawn onwards over the sound skin, without participating in the deeper growth. The borders in these situations were rounded and free, about two lines in thickness, and a probe might be passed beneath them to a distance of half an inch, and, in one or two places, to a greater depth. Indeed, these hollow ways were a source of some inconvenience to the patient, by serving to collect dirt and flue from his dress, and he was obliged, from time to time, to have recourse to means for clearing them out.

Besides the pink hue of the excrescence, its cicatrix-like lines and ridges, the depressions between the latter, and its elevated borders, the surface of the kelis presented a smooth polish, like that of the new skin of the cicatrix of a burn, and a sort of semi-transparency. There were also visible, here and there, particularly about its circumference, several small meandering bloodvessels, apparently veins, collecting the returning blood from minute tributaries.

[1] Portraits of Diseases of the Skin, Plate XLIV., R.

To the touch, the kelis gave the idea of a hard, resisting structure like fibro-cartilage, invested by a soft, velvety-seeming skin. The central portion was harder and more dense than the circumference, and the white lines had all the rigidity of bands of fibrous tissue.

The patient's application to me had reference to the propriety of removing the excrescence, in consequence of the pain and annoyance to which it had given rise during the last three years, and more particularly as the pain was evidently on the increase. At times he suffered much from excessive itching; at other times the pain was smarting, burning, and shooting; and occasionally he experienced a darting sensation, which he compared to an electric shock. The pain did not endure long, but it recurred frequently, and was excited by any movement which produced pressure on the growth, such as bringing his shoulders together, or lying on his side in bed. He was not aware of any increase of pain depending on change of season or weather, and the excrescence underwent no alteration of color or bulk from mental or bodily excitement, exercise, or elevation of temperature.

Besides the kelis on the breast the patient has a second on the outer side of the left leg, over the head and upper part of the shaft of the fibula. This excrescence is of the cylindrical kind (keloide cylindracée Alibert), and, like the preceding, is accompanied by its satellite, a small round tubercle, situated near its lower end, on the calf of the leg. The cylindrical kelis measured three inches in length, and was broader at the extremities than in the middle; measuring at its narrowest point one-quarter of an inch; at its upper end three-eighths of an inch; and at the lower end five-eighths of an inch. Its elevation was about one line.[1]

The patient is not aware of any *cause* for this disease, either local or general; no scratch, no abrasion or undue friction of the skin, as a starting-point. He was in good health at its first appearance, and has remained so since. None of his family have suffered from anything similar. His mother died of cancer of the womb at the age of seventy-one, having been first attacked by that disease within twelve months of her death.

A London physician, forty-one years of age, had two of these tumors of the cylindrical kind; one being situated on the right shoulder, over the spine of the scapula, the other on the buttock of the same side.

They first attracted his attention about five or six years ago (1845),

[1] Since the completion of the above details I have again seen the patient. The kelis on the breast is more painful than it has ever been, and is slowly on the increase. The pain is confined to the edges of the excrescence, and is greatest where the growth is most active, the central part being comparatively insensible. On requiring him to take off his clothes, I observed four tubercles of keloid formation on the left arm; they were situated on the cicatrices of as many boils, which had resulted from an accident he had met with six years before. He had been thrown out of a chaise, and falling on his left side, had sprained his wrist. The arm became swollen and inflamed, and when the inflammation subsided, the boils made their appearance. He had not mentioned these enlargements to me, because he considered them as merely the remains of the boils. They had always maintained the same size, were never painful, but were occasionally affected with pruritus. He informs me that he had never suffered pain from the kelis on the leg, but has sometimes been troubled with pruritus.

when the tumor on the shoulder was not larger than a horse-bean. At present it measures an inch in length, by one-third of an inch in greatest breadth, and has an elevation of about one line. This tumor presents obvious indications of having originally consisted of three hemispherical tubercles, subsequently united by a connecting ridge. The tubercles having been of different dimensions, the kelis is larger at one end than at the other, and the connecting ridge is nodulated near the larger end, from the presence of the third and smallest tubercle.

The kelis on the buttock consists, in like manner, of two tubercles of unequal size joined together by a narrow ridge. The length of this formation is one inch and a half, and its greatest breadth somewhat less than three-quarters of an inch.

The color of the growths is a dull pinkish red; they are smooth and even on the surface, are covered by a very thin epidermis, and have none of the white lines of the previous case. They are soft superficially, but hard, dense, and resisting, like fibrous tissue, in their deeper structure, and they are strictly limited to the skin.

Their most characteristic symptom is an occasional stinging, hot pain, compared by the sufferer to piercing the skin with a fine needle made red hot, and a tingling, itching sensation, after being touched or rubbed, or under an increased degree of cutaneous circulation, such as occurs in hot weather. A vehement desire to scratch is awakened by the itching, but, on the whole, they give rise to little pain or annoyance. In the summer they are more troublesome than in the winter season.

During the last two summers, and particularly the last, the kelis on the buttock was excessively tender, so tender, in fact, as to cause pain on the slightest friction, as in that occasioned by the clothes in walking.

A gentleman, forty-four years of age, of ordinary stature, stout, and of full habit, by profession an actuary in a Metropolitan Assurance Society, had his attention drawn about eight years since, in consequence of suffering a violent itching of the skin, to a small tumor situated on the middle of the breast. The little tumor was oval-shaped, smooth, of a reddish color, and about the size of a split horse-bean. From this time the itching in the tumor and immediately surrounding skin frequently recurred, more especially after any kind of mental or physical excitement, after taking wine, after walking, or upon getting warm. Occasionally there were, superadded to the pruritus, sensations of smarting, stinging, burning, and prickling, particularly on the occurrence of atmospheric changes. In speaking of these sensations, he compares them to the sudden piercing of the skin with a number of needles.

The tumor continued to enlarge gradually for the first two years; it then remained stationary, only changing with his state of health, for the next five years; and, during the last twelve or fifteen months, has been slowly diminishing in size. At present it is very slightly convex, or nearly flat on the surface, and lies across the middle of the sternum, resembling in its general form a sheaf of wheat, being

narrow at the middle, and broad at either end. Its greatest length is one inch and three-quarters; its breadth, at the middle, one-third of an inch; and at the expanded extremities, nearly one inch. It is thickest at the narrow mid-portion, where it has an elevation of one line, and from this point gradually subsides to the level of the surrounding skin.

Its color is pink, with a whitish line running longitudinally through its middle, and dividing, at its expanded portion, into four or five indistinct radiating streaks. It is, and always has been, perfectly smooth and polished; and, upon close inspection, a great number of minute venules may be seen meandering from its central part to the circumference. In consequence of the tension of the skin, the prominences of the pores of the follicles are obliterated, and it might easily be mistaken for the projecting cicatrix of a deep burn. When examined with the finger, the skin is found to possess a velvety softness, beneath which may be felt a hard cord running through the middle of the tumor, and dividing, in the expanded portion on each side, into four or five smaller cords, which extend like roots into, and appear to be lost in, the deeper structure of the corium. This hard cord and its terminal branches correspond with the whitish longitudinal line and its radiated streaks above described.

The principal change which the kelis has undergone in the progress of growth, is a greater amount of general elevation of the whole tumor, and a special prominence of the central cord and its radii. The patient informs me that, at the acme of its growth, it had an elevation of three-quarters of an inch at its central part. He also states, that it underwent frequent changes of dimensions having reference to his state of health, being one while swollen, and another while contracted in size. It has never been wrinkled, nor has there been any cuticular exfoliation from the surface.

In his youth, this gentleman suffered very much from headaches, which were followed by partial loss of hearing, and were probably occasioned by some morbid change in the bones at the base of the cranium. The pains have long since ceased, but the deafness remains. There is one other circumstance in his medical history which deserves to be mentioned. At the age of nineteen, he was troubled by the growth of an indurated tumor from the conjunctiva of the upper eyelid. The tumor enlarged, during twelve months, to the size of a cherry, which it resembled in appearance, and projecting downwards over the eyeball, completely obstructed his vision. Some medical friends, among whom was the late Mr. Walker of St. George's Hospital, agreed, in consultation, that the tumor should be removed, but, as the patient was a little out of health, and the growth of the disease slow, it was arranged that the operation should be deferred for three weeks, during which time the patient should take some gentle aperient medicine daily. At the end of the three weeks, however, the tumor was so much reduced in size, that the operation was postponed, and in two months it had disappeared entirely.

I am induced to dwell on the speedy and complete absorption of the conjunctival tumor, from the parallel which it meets with in the

history of the kelis. When the latter was at the height of its growth, the patient, at the request of a relative, consulted the late Mr. King, of Maddox Street, with a view to an operation, not, the patient distinctly avers, from the inconvenience or annoyance of the disease, but merely from the apprehension of its growing larger, and some day becoming troublesome. Mr. King, finding the disease limited to the skin, suggested his leaving it to itself, remarking, that if it ever extended to the deeper tissues, it would then be time to effect its removal. No remedies of any kind have been used, and yet, as we have seen, after attaining a certain amount of growth, a spontaneous absorption has set in, which has resulted in the very considerable reduction of its size, and the total cessation of the uneasy symptoms which once existed.

I may add, that my observation of the above disease originated in an accidental exploration of the chest with the stethoscope, in order to determine the state of the heart and its valves.

Since the date of my special inquiry into the nature of kelis, namely, in 1851, I have seen many cases of kelis vera. One, occupying a large extent of surface on the left breast, occurred in an American gentleman. When the tumor first appeared, it had been removed by operation, and the result of the operation was a great increase of the disease. In another case, the patient is a lady, whose chest is covered with a crop of small tubercles, twenty or thirty in number, and varying in diameter from three to six lines. Another case is also that of a lady, who has a large, flat, dumb-bell tumor on the right shoulder, and a smaller one of the same nature over the left scapula. In the two latter cases the seat of the hypertrophous growth is the deep stratum of the derma.

KELIS SPURIA.

Kelis spuria is that tubercular prominence of the tissues of the skin which not unfrequently takes place in the cicatrix of a burn, of a scrofulous ulcer, of a surgical operation, or in that caused by the destruction of the cutaneous tissues in confluent small-pox. This kind of kelis appears to be composed of white fibrous tissue, and presents the character of an elevated and elongated ridge to which several bands and cords from the surrounding altered structure of the cicatrix converge. The false kelis appears to be the joint result of hypertrophy, condensation, and concentration of the white fibrous tissue of the skin, and by a special power of contraction, would seem to draw the rest of the cicatrix to itself, and produce a puckering of the adjacent surface.

Treatment.—Judging from the preceding sketch of the symptoms of kelis, it will be concluded that the disease may occasionally become excessively annoying, from the degree of pain which it occasions, from its inconvenient situation in respect of dress or the position of the patient, or from the apprehension of ultimate results, to which it may give rise, in the mind of the patient, or, indeed of the practitioner. On the other hand, it is consoling to reflect that the tumor

has scarcely ever been known to take on an ulcerative or destructive action, or to attain a dangerous bulk. Nevertheless, the patient may be so anxious for relief as to desire an operation, and then, the question arises as to the propriety of using the knife. Alibert and Rayer have both mentioned the possibility of the spontaneous disappearance of the disease, and one of my cases is an apt illustration of the fact. On the other hand, although excision may have been successful in one or two instances, yet, in the majority, the operation has been followed by a reappearance of the disease in the cicatrix, and consequently, in a position more unfavorable than that of the original affection. The secondary kelis has also been generally found to be more active in growth and more painful than its predecessor. In Dr. Warren's case the diseased structure was twice excised; and after the second operation he thus describes its appearance: The tumor was "about two inches long, and half an inch wide, of a slightly red color, raised from the surrounding skin like the scar of a burn, and a small red projection extending from its edge. A burning and shooting was felt in the parts. At each of the points where the needle was passed through, there was a little rising similar to the first, and about the size of a pea, and quite red, so that, instead of one tumor, there were seven." In a case reported by Alibert, in which the kelis was removed, the wound was many months before it healed, and the disease returned with more intensity than before.

The conclusion which naturally results from these observations is unfavorable to operative procedure, and in no case, as it appears to me, is an operation warrantable until every chance of relief by other means has failed.

The treatment heretofore pursued has been chiefly local. Alibert remarks, in his octavo work, that he had been successful in curing two cases by cautery with nitric acid; but, as, in a reprint of the same work, he omits this observation altogether, and speaks unfavorably of all kinds of treatment, I am inclined to think that the disease must have reappeared in those cases. Rayer inclines to the use of pressure, and, in an instance that came under his care, considers that some benefit resulted from this plan; he also alludes to the failure of excision and cauterization. Biett thinks that frictions with hydriodate of potash might be found advantageous; and Cazenave and Schedel are of opinion that the sulphur vapor douche has been beneficial in softening the tumors.

For my own part, I prefer, after regulating the general functions of the system, the maintenance of a steady course of Donovan's solution, in doses of ten drops, three times a day; or of the protioduret of mercury in combination with guaiacum and the oxysulphuret of antimony. The false kelis I have succeeded in removing by means of three-grain doses of the iodide of potassium three times a day, and a Plummer's pill at bedtime.

Locally, the best applications are, collodion, to produce mechanical pressure; liquor plumbi diacetatis, as a sedative to be pencilled on the tumor; the preparations of iodine, either the tincture, or the solution of the iodide of ammonium, as recommended for scrofulo-

derma; or an ointment of iodide of lead, in the proportion of two parts of lead to one of lard. The latter remedy relieves immediately the prickling and uneasy sensation that often accompanies kelis. Great comfort is frequently given by the galbanum and opium plaster spread on wash-leather; or, if there be no irritation, soap plaster or diachylon on wash-leather.

ELEPHANTIASIS.

ELEPHANTIASIS, the Leprosy of the Jews; the Leprosy of the Middle Ages; the Leprosy of the Crusades; the Leprosy of the Arabians; and the Elephantiasis of the Greeks, Elephantiasis Græcorum, is a disease of much interest, on account of its early existence and almost universal diffusion throughout the world, its intense severity, its spontaneous disappearance in countries where it had raged with great violence, and its continuance in others, with all its original and historical characters, up to the present time. We read of it in the Bible, as prevailing amongst the Jews during their residence in Egypt, and after their exodus into Judea; and in the New Testament, as still afflicting them in the time of Christ. We trace it from Syria into Persia and Hindostan, Turkey, Greece, Italy, France, Spain, Britain, Germany, Russia, Scandinavia and America. Besides being so widely distributed, we find it rising and declining at different periods in different parts of the world, moving gradually from the East to the West, and from the South towards the North. Probably limited in the early periods of the world to Egypt[1] and Syria, and confined to that region at the commencement of the Christian era, the disease spread with rapidity through Greece and the South of Europe during the period ranging from the second to the seventh century, reaching its culminating point during the Crusades of the eleventh and twelfth centuries, and began to decline from the fifteenth to the seventeenth century.

The earliest records of the leprosy in Great Britain are those of the Welsh king, Hoel Dha, in the year 950; and from that date until the beginning of the sixteenth century, the disease was common in England. At the latter period, namely, during the reign of Edward the Sixth, 1547 to 1553, it is reported by a commission for suppressing colleges, hospitals, &c., that most of the Lazar-houses in England were empty. In Scotland, leprosy appeared one or two centuries later, the earliest Lazar-houses dating back to about 1150, and the disease was still traceable during the seventeenth century; in 1604, a leprous woman was ordered into the Lazar-house at Aberdeen, and a notice of the same date exists of the presence of patients in the hospital at Kingscase, near Ayr. Symptoms of decline of the disorder in Scotland are perceived in an order for dismantling the Lazar-house at Greenside, Edinburgh, in 1652; but in the islands to the north of

[1] "High up the Nile, 'mid Egypt's central plains,
Springs the dread Leprosy, and there alone."
Lucretius De Naturâ Rerum. Poetical version by John Mason Good, M.D.

Scotland, the Orkneys, Shetland, and Faröe Islands, the disease was in full activity. Towards the middle of the eighteenth century, namely, in 1742, leprosy was supposed to have disappeared in the Shetland Islands, and a public thanksgiving was ordered to commemorate that event; but instances still presented themselves occasionally, as is shown in the account of the parish of Northmaven, given by Mr. Jack, in 1798, and by the more homely instance of a man named John Berns, who, in 1798, was a patient in the Edinburgh Infirmary. This man was a native of Shetland, and a direct descendant from leprous ancestors.[1]

But while leprosy has thus seemingly been disappearing altogether from Great Britain, there are yet many spots amongst its old haunts where it still lingers; as on the shores of the Mediterranean, both in France and Italy, as well as in Greece; on the shores of the Black Sea, where it goes by the name of *Mal de la Crimée;* on the shores of the Caspian Sea; in the islands of the Indian Ocean; in the West Indies; in Madeira; and notably in Iceland and on the coast of Norway. In Norway, the prevalence of leprosy has been so great and so fatal that a royal commission was appointed a few years back, to examine into the nature of the disease, and determine the course to be taken to limit its progress, and if possible, effect its cure. The report of this commission, by Dr. Danielssen and Dr. Böeck, was printed by the Norwegian Government in 1848; it is accompanied by a fasciculus of excellent plates, and is by far the best treatise on elephantiasis in existence.[2]

The name *elephanta* or *elephantiasis* was given to this disease by the early Greek and Roman writers; the term occurs under a poetic synonym in Lucretius, who says, "There is a disease called *elephas*, which has its rise on the river Nile, in the middle of Egypt, and in no other country."[3] Aretæus, who knew the disease well, and has left a good description of it, explains that it received its name from the resemblance of the diseased skin to that of the elephant, and particularly from its vastness and terrible nature. A similar idea gave origin to the terms *morbus herculeus* and *morbus heracleus*. Other names, such as *Leontia*, *Leontiasis; Satyria*, used by Aristotle; *Satyriasis*, *Satyriasmos*, had reference to the deformity of countenance produced by the thickening, rugosity, and discoloration of the skin of the face. The heavy, lion-like brow is very remarkable; and it seems more than probable that the original idea of Satyrs was suggested to the poets by the appearance and habits of the lepers, who, driven from society, lived in holes and caves in the woods, and subsisted by robbery and violence. The latter circumstance caused them to be

[1] Dr. Simpson, of Edinburgh, has given an excellent and interesting account of the Leprosy in Great Britain; in a series of papers entitled "Antiquarian Notices of Leprosy and Leper Hospitals in Scotland and England," published in the "Edinburgh Medical and Surgical Journal," for October, 1841; and January and April, 1842.

[2] Traité de la Spedalskhed, ou Elephantiasis des Grecs; par D. C. Danielssen, Médecin en chef des Hôpitaux de Spedalsques à Bergen; et Wilhelm Böeck, Professeur de le Faculté de Médecine à Christiana. Paris, 1848.

[3] De Naturâ Rerum; translated by the Rev. John Selby Watson. Lucretius was born ninety-five years before Christ.

distinguished in Italy by the names of *malandriosi*, or brigands; *riobman*, or robbers; and *latrones* and *ladres*, thieves; thus ignoring the cause of their original expulsion from society, and confusing their actions with their sufferings. The Arabians styled the disease *judam*, *juzam*, *alzuzam*, *dsjuddam*, *madsjuddam*, *jeddem*, *muzdjeddem*, *didyam*, *damadyand*, *dschiddam*, *sghiddam*, *judas*, &c., probably on account of its early victims being the Jews. It has, besides, received local names in different countries; on the shores of the Black Sea, it is called *maladie de la Crimée*, *lepre de la Chersonèse*, *lepra Taurica;* and in Persia, from its supposed origin in the Crimea, *krimskaia*. In India it is named *fisanikhun*, or *khora*, *kushta* (leprosy), *mahakushta* (great leprosy) *soubharry*, and *jugaru;* in Africa, *kohan*, *koban*, and *kokobe;* in Greece, it is popularly known as the *lova;* in Italy, it is called *il male di san Lazaro*, *male di commachio*, *il male di fegato*, *lebbra;* in Spain, *mal rojo;* and in France, *ladrerie*. The term *mal rojo*, used in Spain, calls the attention to the dark red or reddish brown hue of the diseased skin; while in other countries it has been named *mal noir*, also from the dusky hue of the skin, and to distinguish it from the common white leprosy, *lepra*. In Britain, the old Saxon terms *seo mycle adl* (the myckle ail, or great disease), *hreof* and *licprower* have been given to it, together with the modern appellation, the *black leprosy;* the first of these terms applies to the severity of the complaint; the terms *hreof* and *licprower* signify knotty or tubercular, the latter found in the Northumberland dialect, evidently corresponds with the Norwegian word LIKPRA.[1] Dr. Simpson remarks that the old Scottish name for leprosy was *Liper*. The victims of the disease were called *Lipper Folke*, and a celebrated spa and place of resort for them, two miles from Edinburgh, was thence named Liberton, a corruption of *Liper Town*. The Scandinavian designation of the disease is *spedalskhed*, and in Sweden, *spetalskhan;* in Norway it is also called *arvesygen*, or hereditary disease, and *likpra*, that is knotty or tubercular; in Denmark, besides *spedalskhed*, *likwœrthing* and *likwœrthingsof;* and in Iceland, *holdsveiki*, *leinafalls-syki*, *likthrà* and *malaottosott*. In some parts of South America it has received as an appellation, the term *boasi*.

We must now turn for an instant to an episode in the history of the nomenclature of elephantiasis, which has been and is a source of much confusion. Elephantiasis was, as we have seen, the leprosy of the Jews, of the middle ages, of the crusades; it was a disease which, rising on the banks of the Nile, spread throughout the whole of Europe, from the South towards the North, from the East to the West. It was a disease of great fatality and frightful severity, and its characters are well known amongst all nations. It was not confined to a single member or to a part of the body, but occupied, more or less the whole; and was attended with symptoms which proved the entire mass of the blood to be impregnated with the poison that gave it origin. Under these circumstances, it is somewhat remarkable that a comparatively local affection, the *Barbadoes leg*, *Bucnomia tropica* (Mason Good), should have been mistaken for

[1] Drs. Danielssen and Böeck, *loc. cit.*

elephantiasis, and handed down to us in the records of medicine as the *Elephantiasis Arabum*. The Barbadoes leg, which has no affinity whatever with elephantiasis, was from the enormous size to which the limb affected with this disease grows, the discoloration and roughness of the skin, compared by the Arabian physicians to the foot of the elephant, and called *da ool feel* or *dal fil*, the elephant disease. The Greeks and Romans, having no knowledge of this disease, in translating the works of the Arabian authors, mistook it for the disease familiar to themselves, and called it Elephantiasis; so that, to the present day, we are obliged to warn the student of the error, and distinguish impressively *Elephantiasis Græcorum*, the true and only elephantiasis, from *Elephantiasis Arabum*, the Barbadoes leg. But this was not the only mistake: the Arabian physicians, who knew elephantiasis well, called it, as has been already mentioned, *judam*, *juzam*, &c.; these terms the Greeks translated by the word *lepra*. So that the judam or elephantiasis had now to be distinguished as the *lepra Arabum*, in contradistinction to the lepra already known to the Greeks, the *lepra Græcorum*, corresponding with the common lepra of the present day. These three diseases, then, perfectly distinct from each other, are almost inextricably confounded, namely, elephantiasis, bucnomia, and lepra; elephantiasis having for its synonyms, lepra Arabum, lepra Judæorum, and lepra medii ævi; bucnomia, or Barbadoes leg, having for its synonym, elephantiasis Arabum; and lepra, for its synonym, lepra Græcorum. The only way at present left to set right the difficulty, is to abandon both the Arabs and the Greeks, and retain only the more simple designations of the three diseases, elephantiasis, bucnomia, and lepra.

Elephantiasis is a blood disease, probably originating in an animal poison, and manifesting its existence either by the deposition of a peculiar albuminous substance in the skin, mucous membrane, and other surface tissues of the body, or by affecting chiefly the nervous centres and the nerves. This double mode of manifestation of the disease has caused its division into two kinds, *tubercular* and *anæsthetic*; the former being that which is characterized by deposition in the surface membranes of the body, particularly the skin; the latter, that which is occasioned by deposition in and around the nervous centres and nerves. Both forms are chronic in their course, commencing insidiously, progressing slowly, and lasting for years; sometimes terminating in spontaneous cure, and sometimes in death.

ELEPHANTIASIS TUBERCULOSA.

Syn. *Elephantiasis orientalis; legitima; leonina. Lepra elephantia; leontina; medii ævi; tuberculosa; nodosa.*

Elephantiasis tuberculosa may be known by the development on the skin of erythematous patches, patches of discoloration or maculæ, and tubercles; similar patches and tubercles being also met with on the mucous membrane of the mouth, fauces, nares, and eyes. The erythematous patches are of a dull red or purplish hue, more or less vivid, and vary in size from half an inch to two inches or more in

diameter. They are commonly rounded in form, most deeply colored in the centre, and fade towards the circumference; after a time, the redness of the centre subsides or gives place to a brownish stain, while the circumference spreads for a short distance, and forms a ring with a well-defined border; later still the redness disappears entirely, and leaves behind it a brownish or bronzed stain (*morphœa nigra*), which is more or less permanent. Sometimes the central portion of the patch becomes bleached, and perfectly white and smooth (*morphœa alba*, *leucos*, *leuce*), and is either bordered by an erythematous rim or by the abrupt line of the sound skin somewhat deeper tinted than the rest. To the touch, the centre of the erythematous patches is harder than the surrounding skin; the epidermis frequently desquamates over this part; the tissues of the skin become more and more condensed, sometimes remaining perfectly flat, and sometimes attaining, by continued thickening, the elevation of a tubercle. The tubercle, when newly formed, presents the dull red and purplish hue of the erythematous patch, but sooner or later assumes either the bronzed tint of the discolored skin, or is whitish in hue, from the whitish albuminous substance deposited in its tissue. After a duration of several weeks or months, the tubercles subside, leaving behind them a mark resembling a cicatrix thinner than the surrounding skin, and either bronzed or white. The tubercles vary in size from that of a pea to that of a pigeon's egg; sometimes they remain unchanged for years; at other times they become inflamed, soften, and ulcerate, and give forth a whitish, granular, albuminous substance, and a yellowish-white ichorous secretion. Sometimes this secretion concretes over the surface of the ulcer, and forms a dark crust of considerable thickness, like that of rupia; at other times, the ulcer remains open, becomes deep and excavated, is bordered by irregular, callous, and prominent edges, the circumference being uneven, hard, livid, and often painful, and secretes an abundant, yellowish-white fluid. After a time, during which the morbid disposition in the skin is eliminated, the ulcer closes and heals, leaving behind it a hard, white, irregular, and prominent cicatrix. As one ulcer heals others form, and go through the same process, and the disease is thereby prolonged for an indefinite period, in some instances terminating in spontaneous cure, but more frequently resulting fatally from constitutional irritation, kept up by a similar morbid state of the mucous and serous membranes.

The *mucous membrane* evinces a similar succession of morbid phenomena to those already described as occurring in the skin; the *conjunctiva* is congested, thickened by infiltration, so as to form an elevated ring around the cornea, the cornea becomes opaque, deposition of the peculiar whitish matter of the disease ensues, forming a tubercle, the tubercle softens and ulcerates, and the eye is destroyed. The *Schneiderian membrane* undergoes corresponding changes; the nasal passages are obstructed by the thickening and swelling of the lining membrane, and broken up by the softening and ulceration which follow; the latter causes perforation of the septum, denudation of the bones, and the nose becomes flattened and distorted. The mucous membrane of the *mouth*, *fauces*, *pharynx*, and *larynx*, exhibits the same train of appearances, con-

gested patches, tubercles, and ulcerations. The voice is hoarse from thickening of the lining membrane of the larynx, tubercles form upon the glottis and epiglottis, and both are destroyed when softening, followed by ulceration, ensues. Post-mortem observation shows that the same morbid action extends throughout the mucous membrane of the trachea and bronchial tubes; deposits and tubercles are found also in the pleuræ and lymphatic glands of the lungs, but the tissue of the lungs escapes altogether. So also the morbid action may be traced throughout the *alimentary canal* to the mesenteric glands, and to the peritoneum and its subserous tissue. In the closed membranes of the body, however, although deposition is considerable, and the formation of tubercles abundant, the latter proceeding to softening, there is no ulceration. In the *liver* tubercles are formed, both on the surface and in the substance of the organ, and, when softened, are converted into a thick, yellowish matter. The *spleen*, *kidneys*, *bladder*, *uterus*, *Fallopian tubes*, and *ovaries*, also suffer in a similar way, but the pancreas escapes. The kidneys, from their depurating function, are always found diseased, even when the other internal organs are healthy. The *lymphatic glands* are enlarged by the same morbid deposition, when the parts of the body which they represent are in a state of disease. The invasion of the internal organs by the morbid process only occurs in an advanced stage of the affection of the skin; and, when the abdominal organs have become involved, and are seriously disorganized, the semilunar ganglia are sometimes found softened and destroyed. The coats of the blood-vessels also suffer from deposition and thickening, as do the sheaths of the nerves, the latter more particularly in the anæsthetic form of the disease; but the muscular system, the deep cellular tissue, and the bones, are never attacked.

Although the *erythematous patches* and *maculæ* are the result of a constitutional febrile action, an eruptive fever, in fact, which may be so slight and ephemeral as altogether to escape observation, but which must necessarily determine to the entire surface of the skin, the parts of the body on which the disease first appears are those most exposed to the action of the atmosphere, namely, the face and the hands. The erythema is sometimes so slight and transient, that a discolored spot is the first trace of the disease to be perceived. These erythematous patches, and brownish or bronzed stains, first appear in the superciliary region; they are succeeded by thickening of the skin, and then by the development of the skin in the form of tubercles, which form a heavy mass along the eyebrows. A similar change pervades the whole face, the skin is bronzed, uneven, the pores more evident than natural, the skin between the pores turgid, like the rind of an orange, the natural folds of the skin are thickened, and the wrinkles more deeply furrowed. These changes are most remarkable where the skin is naturally thin and white, as upon the eyelids; but it is nowhere so striking as along the brow, whereon it hangs like a lowering frown, and gives a lion-like sternness to the countenance—*elephantiasis leonina; leontiasis.* Concurrently with the development of tubercles along the superciliary ridge, the hair of the eyebrows falls, and this forms one of the strong characteristics of elephantiasis, *elephantiasis alopecia.*

The ears also, early in the affection, become the seat of thickening and tubercles, the helix sometimes presenting the appearance of a circular tubercular border; and sometimes the lobule of the ear is elongated considerably. Let us, then, array before the mind's eye the features here described: the discolored and wrinkled forehead, the prominent, tuberculated, bald eyebrows, the erythematous and bronzed skin, the congested eyes, thickened eyelids and lips, and the enlarged, red, and lengthened ears, and we shall at once perceive those characters of countenance which the poet and the painter bestow on the satyr, and which have gained for this disease, amongst others of its synonyms, the names *satyria*, *satyriasis*, *satyriasmos*. The suspicion of inordinate venery does not seem established, and admits of explanation in other ways; neither does the statement that persons afflicted with this disease are incapable of procreation. The hands afford another characteristic of the disease; erythematous and brown patches are early developed on the backs of these organs and on the fingers. The latter are remarkable for their thin and taper form, as well as for their brown color, and for a bluish whiteness of the nails. The skin of the fingers is thinner and paler than natural, and there exists in them a greater or less degree of numbness and insensibility.

Defective sensation, indicative of the participation of the nerves in the general disease, is therefore a feature of the tubercular form of elephantiasis, although considerably less marked than in the anæsthetic form. The development of the erythematous patches is attended with some little increase of sensation, but the brownish and bronzed stains (morphœa nigra) are benumbed, and, more decidedly, the white spots (morphœa alba), particularly when attended with induration of the skin, from deposition of the white albuminous substance of elephantiasis.

The *constitutional symptoms* which precede and accompany the development of elephantiasis tuberculosa are such as might be inferred to belong to a disease dependent upon the generation and accumulation of a poison in the blood; and the degree of violence of the symptoms may be supposed to have reference to the quantity of poison present, and the susceptibility of the individual. Sometimes the local disease, always slow and gradual in its progress, is unaccompanied by any perceptible constitutional disturbance; at other times, a pretty smart fever indicates the accumulation of the poison to the point of excess, and Nature's effort to expel it from the body; the direction taken by the poison being, as in the case of most other animal poisons, the skin and mucous membrane. The *precursory symptoms* are, a general feeling of languor, lassitude, dulness, weight of limbs, indisposition for motion, depression of spirits, and somnolency, with nausea and occasional chills. After a longer or shorter period, the eruption appears, and the constitutional symptoms gradually subside. The erythema and maculæ, in their turn, have a duration of several weeks, and sometimes months, when they also decline, leaving behind them little trace of their existence. At an uncertain period, the constitutional symptoms return, and are followed by another burst of erythematous blotches, with a like amount of relief to the general system. These periodical attacks are repeated from time to time, the

constitutional symptoms being sometimes milder and sometimes more severe, but the effects on the skin now become permanent; the bronzed blotches no longer disappear, and the erythematous congestions are perpetuated in the form of tubercles, which, at a more advanced period of the disease, pass into the ulcerative stage. The eruptive, depositive, and ulcerative stages always relieve the constitutional symptoms, and when the discharge from the ulcers is most profuse, the general health is at its best; any check to the discharge, from the healing of ulcers or any other cause, being accompanied by fever, and by a more rapid progress in the deposition of the morbid product of the disease in other parts of the skin or mucous membrane. When the disease attacks the mucous membrane or internal organs, other symptoms occur which indicate its special seat: thus, the affection of the conjunctiva and eyeballs causes loss of vision; that of the mucous membrane of the nose, loss of smell; that of the mouth and tongue, loss of taste; and that of the larynx and air-tubes, hoarseness, loss of voice, dyspnœa, and bronchitis. When the lymphatic glands are affected, there is more or less œdema of the cellular tissue; when the kidneys are attacked, albuminous urine; and when the mesenteric glands and mucous membrane of the intestinal canal are implicated, marasmus and colliquative diarrhœa. Under these secondary affections the patient gradually sinks, and dies from exhaustion.

Drs. Danielssen and Böeck remark, that elephantiasis tuberculosa sometimes, but very rarely, occurs in an *acute form*, in which case the eruptive fever is violent, accompanied with delirium, and lasts from twelve to fifteen days; the eruption rapidly passes into the tubercular stage, the patches of erythematous skin becoming œdematous; the tubercles soften, and in a few weeks the disease accomplishes the progress of years. The disease may now subside into the chronic form, or, failing that, the patient may be carried off by pneumonia, pleuritis, or meningitis, in the course of a few days.

The *average duration* of elephantiasis tuberculosa, according to the same authors, is nine years and a half. Thus, of eighty-eight patients who died of this complaint in the Hospital of St. George, at Bergen, during the years 1840–47, one, between forty and fifty years of age, lived two years; while another, between twenty and thirty, dragged on a miserable existence for twenty-two years; and fifty-four out of the eighty-eight, nearly two-thirds, died between the periods of six and eleven years, both inclusive.

ELEPHANTIASIS ANÆSTHETICA.

Syn. *Elephantiasis alopecia; lepra alopecia medii ævi; lepra articulationum; lepra mortificans; lepra Arabum anaisthetos; lepra phlegmatica; lepra rheumatica; leuce vulgaris; vitiligo alba*, Celsus. *Spiloplaxia indica*, Alibert.

Elephantiasis anæsthetica is characterized by symptoms which indicate the primary seat of the disease to be the nervous system; and the morbid appearances in the skin are such as naturally result from defective innervation. The progress of the disease is slow and

insidious, and the constitutional phenomena, although essentially the same as in the tubercular form, are milder and less distinct. There is languor, lassitude, dulness, depression of spirits, and disposition for solitude; the skin is pale and shrunken, the countenance anxious, and the muscles soft and reduced in size; in a word, *insensibility* and *atrophy* are the distinguishing features of the anæsthetic form of elephantiasis.

The effort of evolution by the skin, instead of producing erythematous patches followed by brownish or bronzed maculæ, results in the formation of white patches (morphœa alba) and bullæ. The *bullæ* are solitary or few in number, and of large size, varying from one to three inches in diameter; they are developed suddenly and without pain, and burst in the course of a few hours, discharging a semi-transparent, viscous, greenish-yellow, and sometimes milky fluid. The bullæ leave behind them an inflamed and ulcerated surface, sometimes painful; the secretion from the denuded surface forms a thin, brownish crust, which, after a time, falls off, and is followed by a second, which, in its turn, is succeeded by others. When the ulcer heals, its place is occupied by a cicatrix, of which the skin is white, smooth, depressed, less sensitive than the surrounding skin, and destitute of hair; resembling, in fact, the white patches of morphœa alba already described. If hair return upon these patches, it is always white and fine, and the restored skin is deprived of its glandular structure. For several years fresh and fresh crops of bullæ continue to be formed and succeeded by white patches, without any further change.

As the disease advances, larger surfaces of the skin become the seat of an erythematous blush, the redness being very slight, and having a lilac or purplish tint; these surfaces also evince an increase of sensation, and are accompanied by a prickling pain, sometimes of considerable severity, like that occasioned by pressure on a nerve. The erythema is only of short duration, but the prickling, sensitive condition of the skin may last for months or even years; and when it at last subsides, the skin is left pale and insensible, deprived of all secretion, from atrophy of the glandular organs, and like parchment, sordid and discolored. When the face is the seat of these changes, the countenance is emaciated and cadaverous, the features lose all expression, the skin hangs in folds, or is drawn tightly over the bones; the lower eyelid droops, producing ectropium. and leaving the conjunctiva dull and dry; the eyelashes fall out; the tears flow over the cheeks; the nose is pinched; the lower lip hangs down, leaving the teeth and gums exposed; the latter recede from the teeth; and the saliva trickles from the mouth. In the limbs, the paralysis of the nerves gives rise to thinness and insensibility of the skin and atrophy of the muscles. The fingers are remarkable for their slender and taper form; and the wasting of the interossei muscles of the metacarpal spaces, particularly of the first, is pathognomonic. As the muscles waste, their balance of power is lost; the extensors draw the first phalanges backward on the dorsum of the hand, while the second and third phalanges are bent inwards by

the flexors; the fingers first, and then the entire limb is distorted, and the joints are rendered conspicuous by their prominence—*elephantiasis nodosa; joint evil.* Similar changes take place in the feet.

Later in the progress of the disease, a purplish, painful spot becomes developed in the foot or hand, generally first in the sole of the foot; it opens, discharges a viscous, ichorous fluid; the loose skin covering it sloughs, and an ulcer is produced. The ulcer is atonic and insensible, has thick, callous edges, deeply excavated, extending into the substance of the muscles, sometimes denuding the bones, and pours forth a copious ichorous secretion. The ulcer continues for months, or even years; and if it heal, as is sometimes the case, another is quickly formed to take its place. Indeed, the comfort and well-being of the patient are dependent on the quantity and continuance of this secretion; for, if the quantity diminish, febrile symptoms immediately ensue, and if it cease, the constitutional symptoms are so severe as greatly to increase the degree of paralysis, and often to threaten life.

In a more advanced stage of the disease, when insensibility has increased to so great a degree, that a lighted taper may be held to the skin without giving pain, a new and pathognomonic symptom arises. One of the fingers or toes is seized with a severe lancinating pain, which seems to have its seat in the bone; the part swells, becomes purple or livid, points, and gives exit to a viscous, ichorous fluid. The pain ceases by degrees; the bone is exposed, loosens, and is expelled through the ulcerous opening. The ulcer then closes and heals, and the finger or toe is left shortened and distorted. After a brief interval, a similar process is repeated in another finger or toe, and in this way the greater number of these organs may be destroyed. Sometimes the morbid action occurs at a joint, which is laid open, and the cartilage exposed; the bones of the metacarpus, metatarsus, and even those of the tarsus, may be thrown off in this way, as may the entire foot, and, more rarely, the hand. After the expulsion of the bone the ulcer heals, and, in the case of the denudation of a joint, the cartilage adheres firmly to the integument.

The mucous membrane, in the anæsthetic form of elephantiasis, is, like the skin, pale, and, in an advanced stage of the disease, insensible; the conjunctiva becomes dry, from retrocession and eversion of the lower eyelid, and frequently becomes coated with a brownish crust; the mucous membrane of the nares is also dry and crusted, and the septum frequently perforated by ulceration, but the ulceration never proceeds to the extent witnessed in the tubercular form of the disease, and the nose never becomes flattened from destruction of the bones. The mucous membrane of the mouth and fauces is also pale, insensible, and dry; the gums recede from the teeth, and taste, as well as sight and smell, is lost.

The morbid element in the anæsthetic form of elephantiasis differs from that of the tubercular form, in being transparent and colorless, instead of opaque and whitish. In the ulcers of the skin, it is represented by the transparent, viscous secretion which is poured out in such quantity. In the internal organs it is found deposited in the subserous tissue, as in that of the lungs, liver, spleen, and kidneys; but

its most abundant and pathognomonic seat is in and upon the brain, spinal cord, and nerves, including the nervous ganglia of the sympathetic system within the abdomen. The abdominal viscera are also found diseased in their substance; the liver is hypertrophic, and often fatty; the spleen is enlarged; the mesenteric glands swollen; and the kidneys always more or less seriously diseased. During the local disturbance which occurs in the extremities, and which gives rise to an ulcer or a slough, or when the secretion from an ulcer is temporarily checked or suspended, the lymphatic glands of the groin and axilla become swollen, and the subcutaneous cellular tissue is rendered œdematous, from effusion of the same morbid albuminous element.

The *constitutional symptoms* resemble those of the tubercular form of the disease, but are less severe, and of longer duration. In the first instance, they are limited to a general feeling of heaviness and languor, with occasional chills, and a fixed paleness and anxious expression of countenance. Then the digestive organs begin to suffer; there is loss of appetite, sense of weight and oppression at the cardia, dryness of the mouth and throat, thirst, disturbed sleep, and increased chilliness of surface. These symptoms are most marked and undergo exacerbation, whenever an increase of deposition in the nervous centres, or internal organs, or an augmentation of the local disease is imminent, or whenever a suppression of secretion occurs; and they subside as soon as the vessels have relieved themselves of their burden of morbid fluids. In the course of years the powers, both of mind and body, are exhausted, and the patient sinks gradually into death; sometimes the last change is ushered in by colliquative diarrhœa and cramps; at others, where the kidneys have become disorganized, and the urine albuminous, it is preceded by coma. When the eyeball is destroyed by the disease, there are often severe pains at the back of the orbit, and necrosis of a bone is also accompanied by deep-seated and often violent pains. At the same time the insensibility of the more superficial parts may be such, that the eye may be divided by the knife without the knowledge of the patient. The coldness of surface which accompanies the insensibility is also a characteristic symptom; the temperature of the hands was rarely higher than 90°, and frequently as low as 68°; while in the armpits and groins, it varied from 97° to 104°.

The average duration of the anæsthetic form of the disease, as deduced from the observation of cases in the hospital at Bergen, during the years 1840–47, was eighteen years and a half; and of twenty-four deaths that occurred during that period, two patients, between forty and sixty years of age, had suffered from the disease for five and six years; and one, who had it from infancy, for thirty-one years. In twelve of the twenty-four cases the duration of the disease was twenty years and upwards.

PATHOLOGY OF ELEPHANTIASIS.

The material morbid element in elephantiasis is a viscous albuminous fluid, chemically composed of an excess of albumen, a small

quantity of fibrin, some fat, and salts; this fluid concretes into a whitish, semi-opaque mass, in the tubercular form of disease, and retains its transparency in the anæsthetic form. Deposited in the tissue of the affected organs, it tends to their disorganization, firstly, by the interruption of circulation and innervation; and secondly, by the process of softening or dissolution. Thus, when the patches of erythematous skin in the tubercular form of elephantiasis were divided with the knife, the corium was found to be swollen and thickened, from the distension of its meshes by a sanguinolent fluid. When the tubercles were divided, the thickening of the corium was found to be more complete; there was less fluid in the interstices of the fibrous structure, and the color of the section presented a brownish tint. While in a third stage, the stage of softening, the structure of the corium was gone, its place being supplied by a yellowish-white granular mass, which, on being squeezed out, resembled gruel. These morbid phenomena serve, moreover, to explain the subsequent changes which ensue, namely, the thinness, absence of color, deficient sensation, want of secretion and hair formation, in fact, the atrophy of the skin where the tubercles subside spontaneously, and the similar appearances which follow the healing of an ulcer, and also the copious ichorous discharge which is poured out when an ulcer is formed.

In the skin, the seat of deposition is the fibrous structure of the corium, and the same in the mucous membrane. The subcutaneous cellular tissue is not unfrequently œdematous, and sometimes thickened from infiltration of a gelatinous or lardaceous deposit; but the latter never assumes the opaque character of the deposition in the skin. In the viscera, the deposition takes place in the subserous cellular tissue, and gives rise to tumors, for the most part small, but sometimes of considerable size. Tumors of a similar kind are occasionally found in the substance of the liver, and the eyeballs are sometimes destroyed by depositions which commence within the interior of their cavity. The ovaries and the lymphatic glands, particularly those of the mesentery, participate in the morbid change. Another common seat of the morbid deposit is the outer coat of the cutaneous arteries and veins, particularly the latter, and the neurilemma of the nerves, the lardaceous deposition occupying all the space between and amongst the fibrils of the nerves. These latter observations explain the arrest of nutrition and atrophy of the affected part of the skin, and also the defective sensation. In some instances Drs. Danielssen and Böeck found the semilunar ganglia of the sympathetic system in a state of softening, and the vessels of the abdomen were not unfrequently in the same morbid state with those of the skin. The organs and tissues which were found to escape the influence of the disease, were the deep cellular tissue, the muscles, bones, parenchyma of the lungs, pancreas, salivary glands, and brain and spinal cord. The blood contained an excess of albumen and fibrin, and, when taken from the patient during the febrile stage preceding the eruption, presented a small proportion of serum, which was green and viscous, and a large solid clot with thin, buffy coat, and frequently on the surface of the latter a stratum of albumen.

In the Anæsthetic Elephantiasis, the prime seat of the morbid deposit is the spinal cord, and the ganglia and sheaths of the nerves. In the autopsies performed by Drs. Danielssen and Böeck, the veins of the spinal cord were found congested, particularly at its posterior part; a dense, albuminous layer, several lines in thickness, was found between the arachnoid and pia mater; there was general infiltration of the membranes of the cord by albuminous fluid; and the cord itself was tough, almost as hard as cartilage, and in some cases reduced to the calibre of a quill. The gray substance of the cord was of a pale, dirty yellow color, and all trace of bloodvessels, excepting in the middle, was lost. With such a state of morbid alteration of the nervous centre, the characteristic phenomena of the disease, the anæmia, emaciation, atrophy of the muscles and skin, mortification of the skin, and necrosis of the bones of the extremities, are easily explained. In cases where the face, nares, and mouth were extensively reduced in sensibility and nutrition, the eyes being in a state of atrophy, the Casserian ganglion was found to be distended with albuminous exudation. The same albuminous deposit has been found within the sheaths of the nerves in other parts of the body, giving them a swollen appearance, and explaining at once the destroyed innervation of the surface and extremities, and the deep-seated pains so common in this disease, and particularly in its later stages. The same transparent albuminous exudation has been found in the subserous tissue of the lungs and liver, and in the substance of the lymphatic glands. The mucous membrane is pale, and less apt to ulcerate than in the tubercular form of disease; the eyeballs become opaque and atrophied; there may be a small ulcer in the septum nasi, but the nose never falls in; the spleen is usually hypertrophied; the liver sometimes fatty, and the kidneys always seriously diseased; the pancreas and salivary glands commonly escape; the blood in the anæsthetic form differs very little from that in tubercular elephantiasis.

In selecting well-marked examples of the two forms of elephantiasis, the distinction between them is very evident; but in slighter cases, there is often a blending of the symptoms belonging to the two. In one out of six cases, according to Drs. Danielssen and Böeck, the disease commences with anæsthesia of the hands or feet, and then passes into the tubercular form; in one case in twenty, the anæsthetic form takes the place of the tubercular; or aborted tubercles are developed in the course of the anæsthetic form. In a word, though frequently quite distinct, and pursuing an independent course, the symptoms of the two forms may be present in the same individual, or the one may pass into the other; moreover, parents afflicted with one form may have children in whom the other form is developed. The tubercular is more common than the anæsthetic form.

CASES OF ELEPHANTIASIS.

The opportunities of observing elephantiasis in England are necessarily and fortunately very restricted at the present day, although the

disease was once a native of Great Britain. Willan remarks that he had only seen two instances, and my own experience does not extend far beyond his; but although the cases which have come before me are few in number, they have happily embraced the leading features of both forms, and have enabled me to comprehend the disease, and carry my experience into a wider field of inquiry, namely, into that of the existence amongst us, even now, of traces of the disease, in a comparatively insignificant, but nevertheless unmistakable shape. The cases which have been presented to me are of two kinds, *imported* and *indigenous;* the imported cases occurring in Europeans who have been born or passed a number of years in countries where the disease is endemical—namely, the East and West Indies and the Mauritius; the indigenous cases being those who had never left this country.

On referring to my notes, I find the cases of two young persons, both presenting the early stage of elephantiasis, but having the characteristic signs of the disease well marked. They were born of European parents, the one, a young lady, in the island of Mauritius; the other, a young man, in Jamaica; the former was nine, the latter twenty-one years of age. Both had the appearance of imperfect development, looking considerably younger than their real age: they evinced a dulness both of mental and physical power, and had a peculiarly sombre and melancholy expression of countenance.

Case 1.—The young lady had no other symptoms of general disturbance of health than listlessness, inactivity, and coldness of hands and feet; but the coldness was not appreciable to herself. Her hands were thin, the fingers long and taper, and bluish towards the ends, and there was a bluish or purplish hue on her lips and cheeks; the conjunctiva and mucous membrane of the mouth and fauces were pale, and the skin of her limbs was less sensitive than natural. This state had come on imperceptibly, and the first symptom that alarmed her parents, and induced them to send her to this country for a change of air and medical aid, was an eruption of erythematous blotches, which made their appearance on the limbs after a slight intermittent feverishness of some days' duration. The feverish symptoms subsided after the development of the eruption, but the latter had continued for several months, and seemed to be permanent; for, although the erythematous spots gradually faded, and sometimes went away completely, yet other spots and patches appeared from time to time, and kept up the complaint. On her visit to me, she had as many as twenty or thirty of these spots dispersed over her limbs, presenting successive stages of development. The spots were rounded in form, not raised above the level of the surrounding skin, and from half an inch to two inches in diameter. At their first appearance they presented a light crimson blush, deeper in the centre than at the circumference; in a few days they had a purplish tint, then a brownish-yellow tint, and then by degrees they faded away, without leaving any trace of their existence. After some months' duration of the disease, the patches faded more slowly, and, instead of disappearing completely, the patch became gradually transformed into a yellowish-brown or blackish stain, *morphœa nigra*. My patient had several of these stains on her

limbs; some were a little rough from desquamation of the cuticle, but the greater number were smooth and glossy, smoother than the surrounding surface, in consequence of obliteration of the lines of motion of the skin, and possessed of a polish of metallic brilliancy, from stretching and thinning of the cuticle. To the touch, the centre of the spots was denser than the normal skin; they were dry, from arrest of function of the sudoriparous glands, and were insensible to a pinch or to the prick of a needle. I was unable to follow this young lady's case further, but at a later period I have no doubt that the bronzed spots will become gradually bleached, from absorption of the coloring pigment; the insensibility will increase, and the skin become white, and pass into a state of atrophy, *morphœa alba, leuce.*

After watching this patient for two years, she grew tired of coming to see me, and I lost sight of her. Six years later, however, she was brought to me sadly changed; the face was covered with tubercles, her complexion was yellowish-brown, the frowning eyebrows had lost their hair, the conjunctivæ were anæmic and glassy, the eyelids were drawn widely open, the hair of her head was scanty, the lobes of the ears enlarged, her limbs thin and shrunken, and her hands and fingers wasted. A lady of title, her relative, besought me, as a boon to her family, that I would take charge of her, that I would take her into hospital, that I would find an asylum for her—in short, that I would take her and do as I pleased with her, and relieve her family of any further anxiety, or even thought of her. The poor girl was to be banished, might be buried, anything, provided that her family heard nothing of her more, except that the tomb had in reality closed over her. Such was my commission; it awakened historic recollections of the ancient leprosy, and I was enabled to comprehend the barbarities with which the leper was pursued in the olden time.

To obtain for her a home was a labor of much difficulty; all who saw her shuddered at the idea of coming in contact with her; and I esteemed it a piece of good fortune, when a sister of mercy of these modern times, a disciple of Florence Nightingale, took my poor patient in charge. A feeling of religious duty supported this lady in her task; and without such support she must have succumbed to the vexations that were heaped upon her in the course of her duty; the inmates of her house protested, the inhabitants of the square in which she lived made painful remarks; she herself failed in health, and her exhausted nervous system was haunted in the night with the fancied presence and touch of her repulsive ward; but she bore up through all. More than once I felt it my duty to say to her: Tell me when you can bear it no longer, and you shall be relieved; I will find some other asylum for her. But religion supported her to the end; and she never once failed to surround with all the comforts in her power the declining days of the poor leper.

My patient died two years after this, at the age of seventeen; she suffered no pain, and seemed to have no idea of her repulsive state. During the later months of her life her vision was weakened; she had ulceration of the larynx; ulceration of the integument of the arms robbed her of nearly the whole of the skin from the shoulders to the

hands; the legs were œdematous; the feet ulcerated; thick gouttes of matter oozed from large openings in her face; and she succumbed at last to exhaustion, precipitated by diarrhœa, probably from ulceration of the mucous lining of the intestines.

Case 2.—My patient from Jamaica was an example of a more advanced stage of the disease than the preceding. He was brought to me in the summer time, and complained of being never warm, while in the winter he scarcely felt the cold. The disease had first shown itself in the form of erythematous blotches, five years ago, after a winter spent in England, during which he had suffered severely from the cold. The blotches appeared first on the calf of the leg, and gradually faded away. During the following year the erythema attacked the lower part of the face, and spread upwards by degrees. A year after, patches were developed on the trunk, while the skin of the face, and particularly of the forehead and brow, began to be discolored and thickened. On presenting himself before me, the lower part of the forehead was thick and prominent, and marked by several rounded elevations or incipient tubercles, which threw the brow into wrinkles, and gave a frowning expression to the countenance. There was a similar tubercular condition of the ears, and a commencing rugosity of the lips and chin. The texture of the skin was coarse and granular, its color dusky brown or tawny, and its surface greasy from effusion of an excess of sebaceous substance. This latter is one of the occasional symptoms of elephantiasis; and Drs. Danielssen and Böeck have remarked, that when it occurs, there is an hypertrophous condition of the sebiparous glands. The prominent, frowning eyebrows of my patient were almost denuded of hair, and, although twenty-one years of age, there was no appearance of whisker or beard. The conjunctiva and mucous membrane of the mouth and fauces were pale, and the voice husky. The trunk of the body and limbs were covered with tawny patches, varying in size from a mere point to the breadth of the palm of the hand, of an irregular figure, but, for the most part, rounded in form, and dry, from deficient perspiratory secretion. The small points were seated in and around the pores of the skin, as if the discoloration had commenced within the follicles; and the larger patches were studded over with these smaller spots, of a deeper tint than the surrounding discoloration. There was no itching or irritation in the blotches, nor any hardening in the centre, as in the previous case; but they were evidently less sensitive than the unaffected skin. The hands were thin, the fingers long, slender, and of a leaden hue, and the skin covering them attenuated and bronzed. He observed that his face was more sensitive to the action of the air than it used to be, and that it was apt to become inflamed when exposed to the rays of the sun. His general health was undisturbed, but he complained of listlessness and indisposition to apply his mind to any mental pursuits.

It has been observed that the loss of hair which accompanies tubercular elephantiasis is restricted to the parts of the body directly affected by the disease, for example, the eyebrows, eyelids, and the white patches of morphœa alba; in these instances, owing its fall to

the destruction or imperfect nutrition of the hair-follicles; but it has been also noticed, that where elephantiasis occurs in a young person, development is retarded, puberty deferred, and there is frequently a defect in the production of hair, as in the present case. I have already remarked that the young lady was more childlike than beseemed her age; and there was also a deficiency of sexual instinct in the male.

The previous cases are examples of elephantiasis in its incipient state, and developed in young persons born of European parents, but in a country where the disease is endemic. I will next proceed to the narration of two cases of Europeans attacked by the disease after a long residence in India.

Case 3.—Captain B——, aged forty-three, had resided in India for seventeen years. Between seven and eight years back, while in Scinde, he observed discolored spots upon his limbs, and a dark discoloration of the skin of the face and neck. He was otherwise quite well in health, and prosecuted his military duties as usual. Within the last three or four years he had been the subject of frequent attacks of intermittent fever, and about two years since, these aguish attacks had become so frequent that he was under the necessity of coming to Europe for relief. He states that he was in a constant state of fever, with exacerbation and rigors every other day. For the relief of this fever he resorted to Kissingen, and put himself under a course of the waters of that place, which brought on a crisis attended with determination of blood to the head. During this illness a number of fresh erythematous patches appeared on his limbs; his face, and particularly the forehead, was congested, and a crop of prominent elevations or tubercles was developed along the eyebrows. The fever then subsided, and ceased somewhat suddenly, and he has had no return of the feverish symptoms. About eighteen months after this attack he appeared before me for relief from the discolored patches on his limbs and body, and from the tubercular condition of his forehead. He made no complaint of his general health otherwise than that his hands were always cold, even in the hottest weather, and this he attributed to "want of circulation." His hands were thin, the fingers of a leaden hue, and the skin smooth and polished, shining with a metallic lustre. There were numerous dark-brown patches on his limbs, some of which were quite smooth, while others were raised, as though œdematous or infiltrated with a yellowish jelly, and apparently translucent. They were dry, from absence of cutaneous secretion, and some of the prominent patches, in which the gelatinous transudation appeared to have been absorbed, were collapsed and wrinkled. Along and immediately above the eyebrows were twelve or fourteen prominences on each side, of about the size and elevation of split peas; in the lower part of the skin of the forehead, and towards the inner end of the eyebrows, the tubercles were isolated; along its outer half they were clustered and confluent. Upon close examination the tubercles were whitish and semi-transparent, and marked by the ramifications of several large venules, the cuticle covering them being of a dark color, like that of the surrounding skin. The hair of the eyebrows was thin, and absent on the tubercles themselves. The dusky hue of the

skin of the forehead, and the heavy frown of the hairless and rugous eyebrows, gave a strongly-marked *leontine* character to the countenance.

Case 4.—Dr. ——, one of the chiefs of the Medical Establishment of Bengal, had resided in India for forty years, and, with the exception of several years of suffering from hepatic disease, enjoyed unusually good health. He is now seventy, and the first symptoms of his present disease made their appearance in 1849, at the age of sixty-seven. He reports, that in the summer of 1850, while in Malta, he became aware of an occasional weakness in walking, and a benumbed sensation on the outer side of the right foot. Later in the year an erythematous blotch showed itself at the seat of the numbness, and was attended with a prickling sensation and a feeling of tightness, as of a wire fastened around the part when moving the foot. In 1851 similar phenomena occurred in the left foot, and several new spots appeared on the right leg. The spots were of a dusky red color, rough, and dry on the surface, tender to the touch, and accompanied by a feeling of tightness. A few months later the feet were very tender, the prickling sensation was more general, and the tightness on walking had extended higher up the leg. While these changes were in progress he began to experience a sensation of numbness on the side of the metacarpo-phalangeal joint of the middle finger, and observed a patch of redness on the next joint. In the month of January of the following year there was an evident numbness of the little and ring-finger of the right hand.

Up to this time he had not been troubled with any constitutional disorder, but, about the middle of January, 1852, he was seized with sickness of stomach, and a fortnight later with a smart attack of fever, accompanied with excessive sweating, the latter symptom sometimes coming on without being preceded by the usual hot stage. He was treated with quinine, and the fever speedily gave way. At the end of eight days he was well; but on the third day of the fever, and during the hot stage, two large, livid, œdematous-looking blotches, which he spoke of as resembling blebs, suddenly made their appearance on the outer border of the left wrist. After the subsidence of this febrile attack the sensibility of his fingers gradually returned. In June he had a second attack of fever, which lasted eleven days, being preceded by sickness; on the ninth day of the fever the numbness returned, but disappeared on the eleventh day. In July there was a third febrile attack of the same kind, accompanied with a burning sensation, pain, and soreness of the outer border of the feet, increased numbness of the ring and little finger of the left hand, redness of the knuckles, pain on exposure to the slightest cold, and the development of a hard and inflamed swelling just above the inner condyle of each upper arm, in the situation of the supra-condyloidean lymphatic gland. During the month of August the disease continued steadily progressing; tubercles were thrown out on the face; erythematous spots and patches appeared on the abdomen and limbs, being preceded by itching and smarting when fully developed. In September there was a still further increase of the disease, the whole forehead

was studded over with tubercles; there were erythematous patches within the mouth, and hard tumors developed in the subcutaneous cellular tissue of the forearms and back of the wrists. The three following months of the year saw only a progressive advance of the disease in every way, with increased insensibility and lividity of the fingers and feet.

In January, 1853, numerous large patches made their appearance on the back of the thighs, and several of those already in existence threw out a broad areola around their circumference, which gave them an annulated appearance, dark, and almost livid in the centre, and bounded by a crimson band. In April, after a hot bath of the temperature of 104°, the face became flushed and spotted over with erythematous patches of a vivid red color, the redness of the spots on other parts of the skin was increased, and they became prominent from œdematous infiltration, while those which were already prominent became enlarged. The symptoms now assumed a progressive character; in the beginning of May, there was inflammation of the left hand and œdema of the right ankle, with a sensation of extreme cold, although the part was hot to the touch. The face remained congested and swollen, the features were enlarged, and the natural wrinkles of the skin deepened; the alæ of the nose were remarkably distended, and hard knots, like tubercles, could be perceived as well as felt under the skin, at the outer angle of the eye, upon the temple, and upon the ears. Inflammation now appeared on the right hand, and the fingers became swollen and painful, like those of the left. The deranged sensations of cold and pain continued in the legs and feet, spots showed themselves on the palms of the hands, and the œdema, which had increased in the patches, was now apparent in the lower eyelids.

The preceding narrative of the case is drawn from a journal kept by the patient himself, and at the conclusion of this period, namely, on the 25th of May, 1853, he first came under my observation, his state being much aggravated, and the disease accelerated, as he believed, by the treatment which had been pursued, and which consisted of arsenic, in large doses, for seven weeks; then iodide of potassium, at first alone, and subsequently with arsenic, for another term of seven weeks; then iodide of potassium, arsenic, and bichloride of mercury, all combined, for three weeks, until the gums became tender; next, the bichloride of mercury with sarsaparilla, for seven weeks; and lastly, two grains of blue pill night and morning, to keep up tenderness of gums, in addition to the bichloride of mercury and sarsaparilla. It was after this severe course of treatment, extending in time from August 13th, 1852, to April 20th, 1853, that he first consulted me; and I could not but agree with him in thinking that the treatment had tended to hasten rather than check the progress of the complaint. I was glad, however, to have the opportunity of seeing the results of this active plan of treatment, conducted, as it had been, by a most able physician; and I felt that little hope of benefit could be looked for from such a course, although consisting of remedies which, *à priori*, and without the experiment, I should have looked upon as best calculated to bring about a cure.

The history of the patient, while under my care, was a progressive advance of the disease, both in eruption and diminution of sensation, until the month of August, when a state of extreme dulness, heaviness, and lethargy came on, accompanied with febrile symptoms, and continued for several weeks. From this attack he gradually recovered, and two months later had regained strength, appetite, and a power of applying his mind to reading. The œdematous tubercles on various parts of his body were becoming smaller; many of the brown-colored spots were fading; and there was a slight increase of power over the muscles of his hands and lower limbs. He could walk across the room with the aid of a servant, and had some feeling in his feet; but his hands were still very sensitive to the influence of cold, and he was obliged to continue the use of warm gloves to protect them.

My treatment during this interval was, in the first place nitro-muriatic acid with gentian; then a course of decoction of the woods with Donovan's solution; then a return to the nitro-muriatic acid and gentian, with the addition of iron; during the febrile attack, ordinary antiphlogistic remedies, and after its cessation, ordinary tonics. I had so little faith in specific remedies, that I felt no inclination to resume them, and I cannot say that any advantage appeared to result from the decoction of the woods.

The nephew of this gentleman, himself a physician, reporting the patient's state of health in March, 1855, observes: "By using the warm salt-water bath, and residing some months on the sea-coast, he so far regained the strength of his limbs that he was able to walk a mile alone, and no appearance of spots was visible, with the exception of a few upon the abdomen."

Case 5.—Another case, which I believe to have been one of anæsthetic elephantiasis, occurring in a person who had never been out of this country, came under my notice in 1849. Dr. Nathaniel Jarvis Highmore, of Bradford, Wiltshire, in a letter to me, introducing the patient, says: "Mrs. L——, married at the age of twenty, her health previously, and for twelve months after, being good. About May, 1842, she became, from family circumstances, the subject of great mental anxiety, weak, poorly, and complained of severe pain in the left side, immediately below the heart; the skin in a few days became dark, discolored in patches, and swollen, especially the hands and feet. After a short time the skin about the throat and chest apparently contracted, giving the sensation of a person tightly grasping it." Some months later, Dr. Highmore describes her state as being one of "depression bordering on mania; she was sleepless, and refused either to speak or eat." Both hands and feet were at this time much swollen, but she retained perfect command over them; later, however, they became stiffened. Vapor baths were administered to her with decided injury, and equally injurious was a course of mercurial medicine. Dr. Highmore first saw her in 1846, at which time she was still under the influence of mental anxiety. She became depressed from the slightest cause; her hands and feet were always cold, and if she were excited, they, as well as her nose, presented a purple tinge. The skin of the arms, face, throat, chest, and neck was hard and contracted, and of a dark olive color.

When this patient appeared before me, she was extremely emaciated, and her skin so much contracted as to appear too small for her body; her lower eyelids were drawn down, exposing more of the eye than usual; her features were lengthened, and the lower lip had fallen away from the mouth, showing the teeth and gums. Her fingers were bent and contracted, and there were several sore places upon them, occasioned by ulceration; the sensibility of the skin was deadened, and her movements were effected with difficulty.

This patient died the year following of acute bronchitis, "no change having taken place in the appearance or functions of the skin."

ETIOLOGY.—The cause of elephantiasis is an animal poison generated in, or received into the blood, accumulated therein, probably by a process analogous to fermentation, to the point of saturation, then acting as a morbid stimulant or irritant, and giving rise to certain phenomena which have for their object the elimination of the poison, either by the natural emunctories, or by deposition in the tissues of the body, the surface tissues in the tubercular form, the nervous centres in the anæsthetic form, or by the discharges from ulcers. The nature and origin of the poison are wholly unknown; certain conditions of the human body, and of the elements around it, must have co-operated at its first production, and those conditions no doubt continued for a time, and may still be in action more strongly in some countries than in others, for the maintenance of the poison, and for the perpetuation of the disease. This constitutes the spontaneous or endemic origin of elephantiasis; and in this point of view we may regard, as springing from such a source, the two instances of Europeans, cases 3 and 4, previously narrated.

Those gentlemen resided for some years in a country in which this disease prevails, and were afflicted with it in consequence; and a similar consequence may be entailed on any one similarly placed. Fortunately, elephantiasis is not very common in India, and, therefore, we may suppose that the causes giving rise to it are weak; but in the Mauritius, and particularly in Norway, they are still strong, and new residents in those parts are in danger of being attacked by the disease. Several of the European settlers in the Mauritius are now suffering severely from elephantiasis, chiefly of the tubercular kind; and Drs. Danielssen and Böeck mention the case of a naval officer who lived for a short time in Norway, and was afterwards afflicted with the disease.

The doctrine of infection and contagion, as applied to elephantiasis, has long been abandoned; several of the older medical authors expressed their doubts as to its communicability by this means, and modern authors are all agreed in denying it; and not only is this the prevailing opinion, so far as ordinary social intercourse is concerned, but it is also denied that a husband can communicate the disease to his wife, or a wife to her husband, or that a nurse can convey the disease to an infant by suckling. Thus the revulsion of opinion is complete, and admits of no origin for the disease but that already stated, and hereditary transmission. A European gentleman from the Mauritius, who lately consulted me, stated that he had resided in the island for

twenty-nine years; he had married a native lady, who, with her five children, was perfectly free from any trace of disease; but that, within the last twelve months, symptoms of an undoubted character had appeared in himself. I did not hesitate to say, that I believed marriage had no share in producing his present symptoms, and that the disease originated in endemic causes alone. His case was interesting, as presenting the earliest phase of the complaint; he was feeling strong, and well, and perfectly free from pain or inconvenience of any kind; but there was numbness of his feet and legs, and part of his arms, and he had scalded himself accidentally with the steam of a boiling tea-kettle, without being aware of any sensation.

With regard to the second and more frequent mode of propagation of the disease, namely, hereditary transmission, the same variation of results is met with as is found in all other natural phenomena. Leprous parents may have all their children affected, or one or two out of an entire family; or the children may escape entirely. The same may take place where the mother or father only is diseased; but it would seem that transmission through the mother is more constant than on the side of the father. Again, the disease may pass over several successive generations, and show itself unexpectedly when the remembrance of such an inheritance is forgotten.

Elephantiasis may occur at any period of life, but is less frequent in infants than in children beyond the age of seven, and most commonly does not show itself until after the period of puberty. It is also more common in the male than in the female sex. When it occurs before puberty it is apt to cause a suspension of sexual development.

Amongst other conditions favoring the occurrence of elephantiasis, is a damp and humid atmosphere. The disease took its origin, as we have seen, on the marshy banks of the Nile, and its habitat still continues to be the banks of rivers; islands, as Mauritius, Madagascar, Madeira, the Greek Islands, the Crimea, Iceland; and sea-coasts, as those of the Black Sea, Mediterranean, and, in particular, the coast of Norway. Temperature is obviously an uninfluential condition, for the disease at the present time evinces its greatest activity in India, the islands of the Indian Sea, and on the coast of Norway.

We may pass over those speculations of human ignorance which attributed the origin of elephantiasis, one while, to divine wrath as a punishment for sin, and another while, to divine favor, securing to the sufferers religious honors.

The known animal poisons are comparatively few, and the laws which govern them being the same, or nearly the same, we are not surprised to find that elephantiasis has been attributed to the poison of syphilis, or rather, that elephantiasis, being the earlier of the two, was supposed to pass into syphilis; and it is a curious fact, that syphilis first began to attract attention in Europe when elephantiasis was on the decline. The points of resemblance between elephantiasis and syphilis are very striking and very remarkable, but hardly more so, perhaps, than between syphilis and other diseases originating in an animal poison; and therefore it would be unphilosophical to infer that there

was originally but one animal poison from which both diseases have sprung. It would be as correct, and equally probable, to assume that two animal poisons existed at the same time, the one being the poison of elephantiasis, the other, that of syphilis; and that, existing together, for a time at least, their symptoms were confounded by the early historians and early medical writers. At the present day, even, I meet with diseases of the skin which I am at a loss to classify under one or the other poison, although to one of the two they undoubtedly belong.

DIAGNOSIS.—Elephantiasis may be confounded with constitutional syphilis, chloasma, melanopathia, leucopathia, anæsthesia and paralysis from ordinary causes. The muddy skin, suffused eyeball, dull-red or copper-colored patches, congested fauces, even the tubercles and enlarged venules on the surface of the skin, all belong equally to syphilis and elephantiasis, at a certain stage of its course; but the pathognomonic signs of elephantiasis are, the defective sensibility of the skin, the thinning and numbness of the fingers and hands, and the history and duration of the complaint. In the first of the cases before narrated, the dull, purplish-red patches, even with the skin, and leaving behind them smooth, brownish, or bronzed stains, more or less insensible to the action of irritants, although pointing to the suspicion of a morbid poison, were totally unlike hereditary syphilis, and could not, from the age of the patient, as well as from the absence of other symptoms, belong to the secondary period of acquired syphilis. The doubtful aspect of the eruption would lead the mind to elephantiasis as the only other known disease which could produce similar appearances. In the second case, the body was covered with patches exactly resembling chloasma, and, but for the other symptoms of elephantiasis, might have been taken for that affection. In chloasma, however, the skin is generally dry, and roughened by a furfuraceous desquamation, besides being more or less irritable; but these patches were smooth, moistened by sebaceous secretion, unaffected by itching, and clearly less sensitive than the surrounding skin. Still, the distinction between them was such as could only be appreciated by the experienced eye, and the diagnosis might have remained uncertain but for the appearance of the fingers and hands, the tuberculated and thickened skin of the face, and the frowning and alopeciated brows. The third case was remarkable for a settled chronic character, which does not belong to the more transient syphilis; the tubercles on the eyebrows were hard and permanent, the patches on the limbs were darker, more leaden, and more polished than the copper-colored stains of syphilis. By the same characters, also, they were unlike chloasma. Then there was the deficient sensibility, the chilled surface, the cold extremities, which pointed specially to the real disease. In the fourth case, I recollect having the impression given me, on the first glance at my patient, of syphilis; the dusky-reddish stains, sprinkled thickly over the face, the slightly-raised tubercles on the forehead and temples, the muddy skin, and diffused eye, all denoted syphilis. But when I saw the attenuated fingers, and broad bronzed patches on the arms, some œdematous, and others shining with metallic lustre, and detected the coldness and numbness of the hands, I discovered my mistake. My first questions

were suggested by the *coup d'œil* thrown on my patient at first sight; but I soon changed my attitude of interrogator for that of listener, and was glad to be taught the curious phenomena and progressive history of the complaint. In a word, *anæsthesia* is the diagnostic character as well of tubercular as of anæsthetic elephantiasis, the difference being one of degree only. In tubercular elephantiasis, the morbid disposition seems to take place in the peripheral nerves alone, while in the anæsthetic form it occurs in the nervous centres; in the former, the numbness, insensibility, defective nutrition, and atrophy, are slight, in the latter they are extreme and fatal.

In comparing elephantiasis and syphilis, it is not uninteresting to observe the close resemblance in pathological phenomena which exists between the two diseases. The tubercles of both are accompanied by an enlargement of the cutaneous venules, or rather by a development of venules where they normally do not exist; in both, the tubercles result from the transudation of an albuminous fluid of jelly-like appearance; both occasion a disorganization, apparently by solution, of the structure of the skin; and both, as a consequence, leave behind them an atrophied state of that membrane when they disappear, as they are wont to do, by interstitial absorption. Also, when they pass into a state of ulceration, both give rise to ill-conditioned, corroding ulcers, which tend to eliminate the poison from the blood.

The distinguishing character between morphœa alba and leucopathia, on the one hand, and morphœa nigra and melanopathia, or chloasma, on the other, may be taken to be the presence or absence of sensation as well as of color, and the state of nutrition of the affected skin. In morphœa, the companion and sometimes the sole representative of elephantiasis, there is always, in association with altered color of the skin, defective sensibility, suspended nutrition, and more or less disorganization of structure. In morphœa nigra there is a temporary increase of secretion, which, however, soon fails; and in morphœa alba there is arrest of secretion and hair formation.

Prognosis.—In endeavoring to form an opinion as to the issue of elephantiasis, a question of much consequence, as affecting the hopes of the patient and the exertions of the physician, we derive very little aid from the writings of the ancients, since by them so many cutaneous affections were included under the general head *Leprosy*, that it is impossible to determine when the real elephantiasis is under consideration, and when some other and more curable affection. Thus, the sacred writings, usually exact and accurate in their description of events, are so confused on the subject of elephantiasis as to require to be put out of the pale of reference when treating on this subject, and the pages of the Greek and Arab authors are equally uncertain. The prevailing opinion of the ancient writers, as well as of many of the moderns, is, that *elephantiasis is incurable, or, to a certain and very limited extent, susceptible of cure.* While, on the other hand, we have before us the fact that the disease has ceased, in other words, has become cured, in countries that it once ravaged, that the cure has been progressive and complete, and that it has followed the course taken by the malady in its progressive march. That the cause may

have lost its power in the countries once afflicted is quite true, but that it has ceased entirely is not so, for examples of the disease still continue to be met with in its old haunts, and there is no reason why at some later day it may not regain all its old power, and become a second time one of the epidemic pestilences which are permitted from time to time to affect mankind. Therefore, while, on the one hand, we have the opinion of the incurability of elephantiasis, we have, on the other hand, the proof of its curability in a race, however little such reasoning may be applicable to the individual.

Amongst other conditions which may influence the prognosis of elephantiasis, are its hereditary or accidental origin, and its acute or chronic invasion. When the disease is accidental in its origin, it offers a better chance of cure than when hereditary, and may be pronounced to be susceptible of cure; and when the disease is acute, it may be expected to yield more readily to treatment than when insidious in its attack and chronic in its progress. Moreover, the new light and new vigor thrown into the subject by Drs. Danielssen and Böeck lead us to hope that much more may be done in the cure of this affection than has been heretofore supposed; and that elephantiasis may be removed from the category of incurable into that of curable complaints.

Treatment.—The treatment practised by the early physicians in this disease appears to have been founded on the principles of a rational medicine, and to the present day we have made little progress beyond that point, having simply glided from a rational expectant to a rational empirical system. In adopting this latter system, we have perhaps attained all that, for the present at least, we may hope to accomplish, and our energies will be better employed in being devoted to the perfection of this plan than in seeking farther into the obscurity of experimental medicine. Aretæus, who has left so excellent an account of elephantiasis in his writings, lays down as the proper plan of treatment, the practice of venesection, followed by the use of purgatives, diluents, baths, and inunction with fat, assisted by a plain, nutritious, and wholesome diet, accompanying the latter, if the powers of the constitution be reduced, with wine. The purgative most preferred is colocynth; the diluent, milk, attenuated with water; and amongst other medicinal substances employed, are, decoctions of simples, particularly the plantain; and the flesh of serpents, which was held in high repute by the ancients, and, when properly prepared, seems to have made a very agreeable article of diet, corresponding with the turtle soup of the present day. Other remedies recommended by Aretæus, are, the plant called sidéritis (ironwort), the trefoil, sorrel, and iris; alum, sulphur, and carbonate and phosphate of lime, under the form of elephant's teeth. The fats used for inunction were those of the panther, lion, and bear.

Ætius follows the general plan of treatment described by Aretæus, adding, that amongst the Indians it was customary to exhibit as a medicine the urine of the ass, probably on account of its diuretic effects, and prescribe as an article of diet the flesh of the crocodile. Serpents and reptiles seem to have acquired their reputation in this

and other diseases in which the skin is affected, from their periodical exuviation of the cuticle, and the magistral inference that their flesh, partaken by man, would enable him to throw off, by a similar process of exuviation, the sordid covering of morbid secretions and scales which is apt to form in these diseases.

Paulus Ægineta, pursuing the same course of treatment, recommends its adoption three or four times a year. To the purgatives already in use he adds aloes and white hellebore, and suggests the administration of an emetic, if needful. He also mentions, in his list of remedies, squills, cummin, calamint, hartshorn, theriac of salmis, and theriac of vipers. As a part of the hygienic plan of regimen, he prescribes gestation, vociferation, friction, and gymnastic exercises, particularly leaping. The body is then to be anointed with the fat of some animal, as of the boar, wolf, goat, or bird, or with butter. After inunction the patient should betake himself to the bath, and be well rubbed with some stimulating juice or spirit, such as fænugreek, or gum ammoniac dissolved in vinegar; and, after the bath, he is to be anointed with a solution of gum ammoniac and alum in white wine, or with some gently stimulating and aromatic oil, such as that of myrtle.

Rhazes, the Arabian physician, commences his treatment with emetics, and reserves venesection for cases of severity or of long standing; he combines turbith (convolvulus terpethum) with colocynth for a purgative, and favors excitation of the skin by means of friction and hot baths, and further by the help of a liniment composed of onions and fennel, or of a lotion of strong acetic acid, in which madder-root has been for some time digested. If the powers of the constitution be reduced by the treatment, he recommends the use of good white wine.

Amongst modern authors, Schilling, who had considerable opportunities of experience in the treatment of elephantiasis, advocates a modified method applicable to the different periods of the disease. He commences by enjoining a moderate and unstimulating diet, consisting of bread, broth, and vegetables, and abstinence from milk. He prescribes laxatives, carefully avoiding mercurials; and if there be signs of plethora, he administers purgatives, and takes blood from the arm. Exercise he considers important, as a means of promoting perspiration, and rousing the patient from the state of apathy into which he is liable to fall; and he further acts upon the skin by means of diluents and hot baths, recommending the latter to be used carefully in advanced stages of the complaint, as being apt to occasion palpitations and faintings. The diluent remedies with which he proposes to dilute the humors are emollient and demulcent drinks, as barley-water, gruel, decoctions of mallow and pellitory; with infusions or decoctions of gently stimulating or alterative herbs, such as agrimony, ground ivy, fumitory, southernwood, veronica; and mild aperients, as senna and rhubarb warmed with aniseed. He recommends these drinks to be taken in quantities of eight pints in the day, and continued for six weeks at a time, and he states, as the effect of the treatment, that the secretions of the bowels and kidneys

are regulated and brought into a healthy condition. After the above preparatory course of six weeks, he recommends the employment of stronger alteratives and sudorifics, such as decoction of saponaria, sarsaparilla, squinanthus, contrayerva, serpentary, pimpernel, rapuntium, zedoary, sassafras, juniper, scolopendrium, holy thistle, pareira brava, and drinks of verjuice. He maintains a strict diet, and if nausea supervene, he diminishes the dose of the remedy, or suspends it for a while. This, like the former course, he continues for a period of six weeks, and, as the state of the patient or of the disease indicates, he bleeds, purges, or adds tonic extracts to the preceding decoctions, such as fumitory, holy thistle, smaller centaury, pimpernel, arum, and wormwood. During the sudorific course he cautions the patient to avoid cold, lest it check a critical perspiration and induce diarrhœa, and he also suggests a cautious administration of purgatives, adding to those already mentioned, namely, senna and rhubarb, —aloes, scammony, and the aperient salts of potash and soda. He prohibits acids and spirits during the treatment, as calculated to excite febrile action, but allows a more nutritive diet, and a little good wine, if the constitution exhibit signs of exhaustion or debility.

The treatment should be pursued for some time after the patients have recovered, and be discontinued by degrees. The skin should be restored to its proper state of tone by spirituous washes and aromatic fumigations, and, after his cure, the patient should carefully follow the prescribed rules of diet and exercise.

In a case treated successfully by Baumés, there were taken three hundred baths in the course of a year; the chief remedies were demulcent, diluent, and sudorific drinks, including asses' milk, and the regimen was nutritious and unstimulating.

Specific remedies, as opposed to the rational expectant system of treatment above laid down, have gained few supporters and little credit. The mineral specifics that have been tried from time to time are, mercury, antimony, arsenic, iodine, zinc, and gold. Drs. Danielssen and Böeck have had little experience in these remedies, their attention having been chiefly given to the physiology and pathology of the disease. Mercury, they say, has largely divided the opinions of physicians, because their diagnosis was inaccurate; and, according to those who are known to have had experience of the disease, both that mineral and its compounds have been found to be not merely useless, but also injurious. The chloride and bichloride of mercury have generally given rise to vomiting and diarrhœa difficult to check, or, failing this, have produced dyscrasis of the blood, a spongy and bleeding state of the gums, and a scorbutic state of the surface membranes. Antimony, the *primum mobile* of Paracelsus, had great weight with the older physicians, in the fourfold capacity of purgative, sudorific, diuretic, and alterative; but it is of little if any value in elephantiasis. The preparations of iodine Drs. Danielssen and Böeck found to produce a burning sensation, with pain and swelling of the skin, in tubercular elephantiasis, when given in ordinary doses; but no such inconvenience, when the iodide of potassium, in doses of a grain or a grain and a half, was administered. In the latter case, a

slight decrease of the tumors was observed after a long period of continuance of the remedy, but the improvement did not last. In the anæsthetic form, the iodide of potassium relieved the pains in the bones which accompany this form of the disease; and the same effect resulted from the use of the bromide of potassium. Of the preparations of gold, these gentlemen had no experience; they made trial of the chloride of zinc without benefit, and Donovan's solution was administered to seven patients, in increasing doses, and for a long period, without utility. Four of these patients suffered under the tubercular, and three under the anæsthetic, form of the disease. Of arsenic, they speak in terms of equal discouragement, and in a manner to suggest the doubt as to whether it could have been properly and carefully used, to produce the effects which they mention. One preparation which they enumerate, the arseniate of copper, seems to have given rise to a succession of painful symptoms affecting the abdominal viscera.

The *vegetable specifics* which have gained a reputation from time to time are, black hellebore, lauded by Aretæus; pennyroyal, praised by Pliny; the plantain, esteemed by Celsus; the anabasis aphylla, a plant which grows on the shores of the Caspian Sea, commended by Gmelin and Pallas, but not valued by Martius; the asclepias gigantea of India, hydrocotyle asiatica, dulcamara, mezereon, aconite, conium, ledum palustre, &c.

The *animal* kingdom has contributed *specific remedies* from the class of reptiles, saurian, ophidian, and chelonian; and from the class of insects, cantharides. The latter remedy has acquired a false credit, probably from error of diagnosis, some form of common lepra having been mistaken for this disease. Drs. Danielssen and Böeck make the same remark with regard to tar, which has also, and with little pretence, been admitted among the remedies for elephantiasis.

Reverting for a moment to the treatment of this disease pursued during the middle ages, we find it, as at the present day, displayed to us under the three aspects which constitute a rational expectant medicine, namely, hygienic, dietetic, and medicinal. In its *hygienic* aspect, fresh air, sufficient exercise, physical and moral, baths for cleanliness and to invigorate the skin, are as necessary now as they were then. In a *dietetic* point of view, a nutritive, unstimulating diet is one of the first recommendations at present, as well as in the past; and *medicinally*, diluents, laxatives, and alteratives, are almost merged in the general consideration of diet. Then there remain only *special* emergencies, which must be met by special remedies, and the application of those new aids which the light of science has made obvious to us, and those truths which she has taught us in later times. In respect of air, an inland residence lying high and dry, is more desirable than that of a river, lake, or the sea; for it is in the latter situations that elephantiasis is chiefly found. The plough and the new-turned earth would probably supply the double requisite of the best air and good exercise. In respect of baths, we have no need at the present day to inquire the nature of the fluid of which it should consist. The plain water-bath is as good as that of milk, and better

far than the bath of blood in which the monarch of Egypt was wont to seethe his leprous limbs. As diet, a judicious blending of the animal and the vegetable seems that which is best fitted to man, in disease as in health; it is that which his tastes select; it is that which the naturalist predicates, from the structure of his teeth, and conformation of his stomach, he was born to. We may, therefore, afford a smile of pity at the contrariety of opinions that exist with regard to the nature of the diet employed, a contrariety as great as the varied tastes of man; one while, the diet should be wholly vegetable; now, to consist alone of antiscorbutic plants, to the exclusion of the cerealia and farinacea; then, to be chiefly of the latter class; another while, it should be milk; then, no milk; now, no fat, although the cod-liver oil is a remedy of acknowledged excellence; then, asses' flesh, and so on, until the mind is bewildered. But, from this very contrariety, we are warranted in drawing the conclusion, that a simple, moderate, and unstimulating diet is not only judicious, but necessary.

Amongst the specific remedies advocated in the treatment of elephantiasis, is one that I would fain have omitted all reference to, and I only mention now to condemn, namely, *castration*. Under the impression that the stimulus given to the blood by the generative system was an excitant of the disease, patients have relieved themselves of these glandular organs, but without any benefit whatever; and the combined opinion of all modern authors is opposed to the barbarous practice.

To resume the practical consideration of the remedial history of this disease, I may now mention, that in 1844, Drs. Danielssen and Böeck projected a plan of treatment which was found more successful than any which had been pursued up to that time. They thus describe their plan:

Considering elephantiasis to be a disease depending on dyscrasis of the blood, we were of opinion that the treatment should be directed against the abnormal composition of that fluid; with which object, we prescribed a regular diet, together with cod-liver oil, the iodides of potash, iron, and mercury, the bromide of potash, and sulphur baths. As for arsenic, fearing it might give rise to indurations of the abdominal viscera, we have used it sparingly, and in very small doses. Thus far, the treatment is the same for both forms of the disease. Turning now to the tubercular kind, we endeavor to follow the method pursued by Nature in the removal of the tubercles; and perceiving that her process consisted in softening and subsequent absorption, we had recourse to means adapted to bring about the same result. We sought to subdue the morbid state of the skin, and reduce its congestions, partly by frequent bleedings, and partly by stimulating the mucous membrane of the alimentary canal. For the latter purpose we had recourse to sulphate of magnesia, arsenic, or the tincture of cantharides. As a local treatment of the tubercles, we employed the acid nitrate of mercury (hydrargyri nitratis, one drachm; acidi nitrici, two drachms) for their destruction. Where they were less in size, and situated on the face, we pencilled them daily, or every other day, with a caustic solution of potash (potassæ fusæ, one drachm; aquæ

destillatæ, two drachms); and where they were scattered generally over the body, we had recourse to caustic and sulphuretted baths, the caustic bath being composed of six or eight ounces of carbonate of potash, and an equal quantity of quicklime, mingled with the water; the sulphuretted bath, of five or six ounces of sulphuret of potash. The patients were kept in a bath for a period varying from one to three-quarters of an hour; the head was repeatedly dipped, and after each dip was deluged with cold water; and the bath was repeated daily, or every other day. Sometimes the caustic bath gave rise to superficial ulceration of the tubercles; when the ulceration was slight, the baths were continued, but when it became greater, they were suspended for awhile. We also found caustic potash of service in those cases of tubercular deposition within the larynx which sometimes give rise to asphyxia; we combined the potash with honey, and applied it by means of a brush to the epiglottis, and even to the isthmus of the larynx. A paroxysm of cough succeeded the application, but each time the respiration became easier, and, after a while, the symptoms of suffocation subsided.

In the anæsthetic form of the disease, we directed our attention chiefly to the nervous centres, and sought to neutralize or interrupt the existing morbid action by means of cupping in the region of the vertebral column, and counter-irritation by means of tartarized antimony ointment rubbed into the incisions, or an ointment of iodide or bromide of potash, or by moxa. In a number of cases treated in this way, we were enabled to determine that the several remedies already mentioned had a decidedly favorable influence on the disease, although, from the incompleteness of our experiments, none were perfectly cured.

In illustration of this method of treatment, Dr. Danielssen adduces the two following cases:

A tailor, in whom the disease was hereditary, suffered from elephantiasis in its compound form, tubercular and anæsthetic. He was treated by Dr. Danielssen, and got well. Twelve months after, he suffered a relapse, from cold, and the disease assumed the pure anæsthetic form. There was insensibility of the skin of the extremities, particularly the hands, and an increased and painful sensitiveness of the deeper parts, especially of the fingers, to such an extent that the latter were bent, and he was unable to hold a spoon. He was treated for this attack with a three months' course of iodine and bromide of potassium, and with decided benefit; the excessive sensitiveness of the fingers had subsided, and given place to insensibility, and he was unable to feel his needle. He was thin and emaciated, his cheeks were pale and flabby, and his skin dry and inelastic. Dr. Danielssen now saw him. He continued the iodide and bromide of potassium, ordered cupping along the vertebral column, and subsequently, the application of the moxa. The patient improved rapidly, his fingers became straight and recovered their flexibility, the sensibility of the skin returned, his face acquired the aspect of health, and in four months he was enabled to resume his occupation.

The second case was that of a man aged twenty-four, whose body was covered with scattered tubercles from head to foot, some of which

occupied the deeper part of the skin, others were prominent, some were in a state of softening, and a few were ulcerated and covered with crusts. His face was swollen and livid; the tubercles on its surface were hard and bluish, the eyebrows were in great part gone, and whitish tubercles were apparent in the nasal fossæ. There were, besides, œdema of the legs and feet, and a swollen state of the inguinal glands. The disease had commenced three or four years previously, by an eruption of reddish spots, which first broke out on the arm, and subsequently on other parts of the body; the red spots becoming, at a later period, the present tubercles. He knew no cause for the attack, excepting that he had been frequently exposed to cold and rain, and had often slept in his wet clothes. His progenitors and family were entirely free from the disease, and, saving the above, he had no other symptoms than occasional pains in the legs.

In the month of April he was bled to twelve ounces; five minims of Fowler's solution of arsenic were given twice a day, half an ounce of cod-liver oil three times a day, and a sea-bath four times a week. In May the bleeding was repeated to ten ounces; he was cupped with eight glasses on the legs, and the Fowler's solution was increased to eleven drops, then thirteen, then fifteen. In June he was bled to twelve ounces; cupped with six glasses on the legs; the arsenic was stopped early in the month, having given rise to pains in the abdomen and cough; and a little more than a grain of iodide of potassium was administered every two hours, for pains in the legs and soles of the feet, which came on chiefly at night. In July he was twice cupped in the vertebral region, each time with six glasses; and the cod-liver oil was discontinued, having excited disgust. In August the proto-ioduret of mercury was given for eighteen days; at first, half a grain, subsequently, one grain twice a day, for the purpose, apparently, of hastening the healing of the ulcers, and removing a thickening which had been left in the cicatrices, together with the thickening and infiltration of the integument of the legs. These objects were, in a great measure, gained, the thickening of the cicatrices and infiltration of the skin of the legs were removed, but the ulcers took to bleeding, periodical pains occurred in the legs, and pains in the teeth. After the cessation of the mercury, the ulcers progressed rapidly. In September the iodide of potassium was given up, cupping on the back was repeated several times, with the view of restoring the sensibility of the hands and feet, and, for the same object, baths, containing sulphuret of potash, and the caustic bath of carbonate of potash and quicklime were ordered; at first, the sulphuretted bath daily, then in alternation with the caustic bath, and later still, the caustic bath increased in strength (eight ounces of lime and eight ounces of potash). In October he reported himself as feeling better than for years before; he had a desire for work, and, with the exception of a bluish tint of complexion, looked fresh and animated. The baths were given up; but, as a little dulness of feeling still remained in the fingers and toes, a moxa of the size of a crown-piece was placed near the spine, between the sixth and tenth vertebræ. In November the moxa was kept open by means of from sixteen to twenty peas, the sensibility

was almost completely restored, but he had still a difficulty in picking up small objects such as needles. In December sensibility was perfect; he had no pains of any sort, he was active, and returned to his home, although against the wishes of his physician, who still wished to observe his progress, and anticipate any chance of relapse.

Early in the treatment, as early as May, the tubercles had commenced to diminish in size, and their diminution was progressive to the end of the treatment, when they had disappeared entirely, leaving behind them, however, a bluish and apparently deep-seated discoloration,—the skin of the part being thinner than natural. They were at first painted with the strong caustic solution, and subsequently with the acid nitrate of mercury, which caused absorption of some and ulceration of others. The ulcers within the nose were painted with a liniment of laudanum and oil, one part of the former and two of the latter. In June the ulcers were in process of healing, and their progress was continued steadily. In July the tubercles on the face had disappeared, but their remains might be detected under the skin, as a slight thickening of the tissues. To remove these remains, the iodide of mercury was successfully given in August; and, although the primary effect of this remedy on the ulcers was not satisfactory, it no doubt contributed to their rapid healing, which took place immediately afterwards. The thickening and infiltration of the legs was attacked in May by cupping, the cupping being repeated in June, and received its *coup de grâce* in August, from the eighteen days' course of iodide of mercury. The nocturnal pains in the legs and soles of the feet, disturbing sleep, complained of in June, yielded to the iodide of potassium, in doses of four, seven, to ten grains daily, assisted, firstly, by a general bleeding, and subsequently by the cupping practised for the swelling and infiltration of the integument of the legs. The iodide of potash was given in a peculiar manner, in one-grain doses every two hours. I have no experience of this mode of administering the remedy, and should have preferred five grains three times a day. This, however, is a matter to be determined by experience alone. The arsenic seems to have played a very unimportant part in the treatment; it was taken in July for seven weeks, and increased too rapidly in dose, rising during that short period from five to fifteen drops of Fowler's solution. It had, therefore, every opportunity of developing its bad effects, without having time to work the benefit which arsenic is capable of producing when given in moderate and long-continued doses. Early in June it was found necessary to stop it, from the occurrence of abdominal pains and cough. The insensibility of the feet and hands, which followed the pains in those parts, no doubt received benefit from the iodide of mercury, and also from the stimulating baths; but the remedy especially and most successfully directed against that symptom was bleeding and counter-irritation; the patient was repeatedly cupped in the region of the spine, during the month of September, and had a large moxa applied in October; the ulcer made by the moxa was still open in December.

The local treatment of the ulcers of elephantiasis is to be conducted according to the common principles of surgery, to allay inflammation,

control decomposition, assist the separation of dead parts, and promote the healing process. The enumeration of these indications suggests the means and remedies which should be employed. Schilling recommends the tincture of aloes, myrrh, and amber, useful stimulants, which, in modern surgery, have been transferred to the stable, and given place to better means. He cautions us against the use of oils and fats, and strongly against mercurial ointments, which, he says, the skin cannot bear, so long as the morbid miasm retains its place within the body.

It may be gathered from the views of treatment now put forth, that we must rely upon ourselves, and not upon any fortuitous gifts of Providence, to cure elephantiasis; and on a due appreciation of this truth will, in great measure, depend our success, and the safety of our patient. We must use, and learn to use effectively, the means we have; and in doing this, we shall acquire a more powerful specific than any that can be presented ready prepared to our hand. If, after this essay, the specific should arrive, we shall be the better able to use it judiciously; if it should not be forthcoming, we have discovered the means of doing without it. It is probable that elephantiasis would never have been the scourge to the world it has, if this truth had been felt and acted upon earlier; if physicians had set themselves to discover the cause of the disease, and followed up their search by working methodically to remove that cause, rather than puzzle themselves and their successors by vain theories and equally vain experiments with the long list of simples which have been proved to be at least innocuous to man. Drs. Danielssen and Böeck, discarding all these empirical means, have determined the cause of the disease, be it miasm or poison, to be present in the blood. They have observed the alterations of the vital fluid occasioned by its presence; they have traced the morbid effects of that cause in its action on the nervous system, and on the various tissues of the body; they have pointed out that the morbid products are projected to the surface of the affected organs, and to the surface of the body; and they have established a principle of treatment which shall change the composition of the blood, alter and improve nutrition, and eliminate the poisonous elements of the disease. In pursuing this principle they have the means to a favorable issue in their hands, and I doubt not will successfully combat the disease which is now ravaging the shores of their country, and at the same time give a useful practical lesson to the world.

The treatment of elephantiasis, therefore, whether it present the tubercular or anæsthetic form, should be conducted on the same principle. Portions of the blood of the patient should be taken from time to time, the quantity and frequency to be regulated by his strength; and the blood so taken should be replaced by the nutritive matter derived from a well-selected diet. Thus, the morbid blood will give place to a sounder and more healthy fluid. Alteratives should be given, to alter and improve the chemistry of nutrition, than which none are better than arsenic, judiciously employed, and cod-liver oil. Thus, sanguification will be directly benefited, and with sanguification, as a matter of course, innervation. Elimination

is to be rendered more energetic, to facilitate the requisite changes in nutrition. With this view, the alimentary canal, the liver, the kidneys, the skin, are all to be brought into more active play; to which end, saline aperients and diluents are the appropriate remedies. Elimination, stimulation, and counter-irritation of that most potent emunctory, the skin, are all set in operation by baths, the hot air and vapor bath, sea-bath, sulphuretted bath, and caustic bath, already mentioned; and, for a local purpose, the skin may be further stimulated by counter-irritants, and by the use of the moxa. Local symptoms, such as infiltration and thickening of the skin, require simply a local application of the same general principle, such as cupping or leeches; and the loss of sensibility of parts of the body, cupping and moxa to the corresponding parts of the spine.

Having now discussed the general principles of treatment, as founded on the observations and researches of Drs. Danielssen and Böeck, it will be well to pass in review certain specific remedies at present in use in those countries where tubercular leprosy still prevails. The most important of these remedies are, the Asclepias gigantea, of Hindostan, and the Hydrocotyle Asiatica.

The *Asclepias gigantea*, or Rumex gigantea, in the native language of Hindostan called Mudar, Muddar, or Mudarrh, has gained much reputation in the treatment of tubercular leprosy. Robinson, in his Essay on "Elephantiasis, as it appears in Hindostan,"[1] remarks, that in the treatment of this disease, bleeding, mercury, and antimony, used singly, are of no use; but that the last two, combined with the root of the mudar, have been found successful, when aided by the application of topical stimulants. The formula he proposes is composed of half a grain of calomel, three grains of antimonial powder, and from six to ten grains of the powder of the root bark of the asclepias, to be administered three times a day; and the local stimulant, a weak acid solution (four grains to the pint, with ten minims of hydrochloric acid) of the bichloride of mercury, applied with friction to the local affection.

The Asclepias gigantea was discovered by Playfair, who called it *vegetable mercury*, and regarded it as specific in the cure of lues venerea, elephantiasis, and cutaneous eruptions. It is, he remarks, the most powerful alterative hitherto known, and an excellent deobstruent. In the *jugaru*, or leprosy of the joints, he never found it fail in healing the ulcers, and often succeeded in effecting a perfect cure of the disease. Robinson agrees with Playfair as to the utility of the asclepias in elephantiasis, and bears witness to its "powerful effects as a deobstruent and sudorific, in almost all cutaneous eruptions arising from obstructed perspiration and an apathy of the extreme vessels. Its action is quick and decided, causing a sense of heat in the stomach, which rapidly pervades every part of the system, and produces a titillating feel on the skin, from the renewed circulation through the minute vessels. It does not appear to be useful, or, indeed, admissible, where the affection is inflammatory or

[1] "Medico-Chirurgical Transactions," vol. x. 1819.

the eruption pustular. The great and rapid determination it causes to the skin has an obvious tendency to increase such diseases. I have tried it freely in lues venerea, but cannot venture to recommend it as a substitute for mercury. It will enable you to heal a chancre, but does not eradicate the poison. In the secondary symptoms, however, it is an admirable ally, superseding, by its certain efficacy, the exhibition of mezereon, sarsaparilla, and other vegetables of doubtful utility. Where mercury has been used, but cannot be pushed safely any further, the mudar rapidly recruits the constitution, heals the ulcers, removes the blotches from the skin, and perfects the cure. The only part of the plant useful in medicine is the bark of the roots. It should be gathered in the months of March, April, and May. The bark stripped from the root, being well dried, is readily beaten into a fine powder, of which the dose is from three to ten grains, thrice a day, for an adult; six grains is enough to commence with. As the plant grows wild everywhere throughout Hindostan, it may be applied advantageously externally. I have often used a poultice made of equal parts of this powder and linseed dust, with decided benefit, in bad ulcers, from whatever cause; and even in gangrene it acts as a detergent in cleansing the sore, and powerfully stimulates the healthy granulations. Decoctions may often be employed, where the stomach would reject it in substance. When it causes pain in the stomach, a few grains of magnesia or prepared kali added to each dose will prevent that effect. That this medicine is really the principal in the cure, I have no doubt; for I scarcely ever succeeded by any means in curing or even checking the disease before I employed it, and have scarcely ever failed of doing both since."

The asclepias has been employed in combination with arsenic, as in the celebrated "Asiatic pills," the formula of which is as follows:

Arsenici protoxydi, gr. lv.
Piperis nigri, ℥ix.
Asclepiadis giganteæ, radicis corticis, ℥iv. ℈iv.

The arsenic and black pepper are to be well rubbed together, at intervals of time, for four days; the mudar and water are then added, to form a mass, and the latter is to be divided into eight hundred pills. The dose of these pills is one twice a day, each pill containing one-fourteenth of a grain of arsenic.

The mudar powder is also used in Hindostan in the form of an ointment, in combination with lard or spermaceti cerate.

The other vegetable remedy which has attained so high and apparently so deserved a reputation in the East, the *Hydrocotyle Asiatica*, is a plant resembling in appearance and ordinary characters the common hydrocotyle of the stagnant ponds of this country. The hydrocotyle asiatica is reputed to be specific in many diseases, particularly those of the skin, and useful in all cases of leprosy. Mr. Hunter, in his report to the Board of Health of Madras, in February, 1854, on fifty cases of disease of various kinds, of which thirty were cured, and the rest greatly benefited, remarks, that "the affections in which this medicine has been peculiarly efficacious are, ulceration,

syphilis, and scrofula. Almost all cases of ulceration are cured with this remedy. Amongst the cures were several cases which had resisted other modes of treatment. This medicine may be recommended as an excellent stomachic and tonic. It appears to have a peculiar action on the capillaries of the mucous surfaces, and on the skin; it causes at first a sensation of heat in the stomach, and at the same time a prickling in the extremities and then over the whole skin of the body, soon followed by an augmentation of appetite and transpiration, and a general improvement in the health."

M. Boileau, a physician of Mauritius, published an account of this plant, as a remedy for tubercular leprosy, in 1852; and M. Jules Lepine, of Pondicherry, in the *Journal de Pharmacie et de Chimie* for 1855, has given a further description of the plant, with a chemical analysis, pharmacology, and list of the formulæ used in the Government dispensary at that place. The properties of the plant seem to be due to a peculiar vegetable principle which he names *vellarine*, from *vellarai*, a native name of the hydrocotyle. Vellarine is a thick, pale yellow oil, having a bitter and penetrating taste which abides for some time on the tongue, and is most abundant in the roots, wherein it exists in the proportion of somewhat more than one per cent. Besides the vellarine there is a yellow oil, brown resin, green resin, saccharine extract, non-saccharine extract, and bitter extract; the latter, in the proportion of ten and a half per cent., is found only in the root. The fresh plant is slightly bitter and aromatic in taste.

The pharmaceutical preparations of the hydrocotyle are a *powder* of the entire plant, of which the dose ranges from one to six grains daily; a *syrup*, prepared from the juice, useful for children, the dose ranging from two drachms to two ounces daily; a *tincture*, the daily dose ranging from ten to forty drops; an *infusion;* an *ointment* of the green plant; and *baths*, containing four pounds of the plant, either green or dried. Similar preparations are made from the root, and are much more active than those of the entire plant, the root containing, as already mentioned, the largest proportion of vellarine. Vellarine cannot, however, be employed separately, from its great hygrometric qualities and active tendency to decompose. Vellarine has also the property of volatilization at 212°, and the virtues of the plant are consequently destroyed by exposure to heat. For this reason decoction and extract are inadmissible forms.

Dr. Marshall, of Bombay, found nitric acid a valuable and successful remedy, exhibited in the dose of one drachm daily, diluted with a pint or a pint and a half of water. Of two hundred patients treated on this plan, more than one-third were cured, and the greater proportion of the remainder much benefited.

EXISTING FORMS OF ELEPHANTIASIS.

Taking a mental survey of that grand, that elephant disease, the leprosy of the middle ages, which forms so prominent a feature in the history of Europe, and especially of Great Britain, of which examples have not very long vanished from our land, the question

naturally arises to the mind, And is it gone? And if it be gone, has it left no remains behind? Are there no traces of *the* leprosy? Is there nothing at the present hour which belongs to, is a part of, is a living record of that immense disease? Can our medical antiquaries discover no impression of its gigantic footsteps? Has it passed away like a shadow, or like the wind totally, and never to be seen again? To which we answer, It would be contrary to all analogy to suppose that it had so totally passed away as not to leave a trace; and yet no sign exists in the records of medicine to tell us that such is not the case. But though the sign may be absent in the records of medicine, the infallible sign remains imprinted on man. Leprosy exists amongst us still, but only as a faint trace of a worn-out disease, or as an ember of the burnt-out fire. God forbid that the spark should be rekindled! I repeat, that elephantiasis still exists amongst us in this country as a *faint trace* of its former self, and the observation of that trace, however faint, becomes a matter of interesting research. Although a mere shadow in comparison with the parent disease, it is nevertheless sufficient to occasion considerable annoyance to the sufferer, and to bring him not unfrequently under the inspection of the medical man. Nor, when once pointed out, can the medical man doubt for an instant the nature of the disease which he has before him: there is the insensibility, the deposition, the blanching, the exhaustion of function, and the atrophy of the parent malady, with all their original distinctness, indeed, one complete symptom of the pure elephantiasis, preserved unchanged, as it existed amongst the Jews, and as it is to be found at this moment on the shores of Norway, the symptom which was called by the ancients *morphœa*. This symptom, or rather sign, has been handed down to us by our forefathers, and it is this which I shall now proceed to describe, preserving the name by which it was originally known, namely,

MORPHŒA.

Morphœa, derived from the Greek word *μορφὴ*, *forma*, signifying a visible appearance, and in application to its seat, a visible appearance or spot upon the skin, is, as its name implies, a spot upon or in the skin, of irregular form, and either white, *morphœa alba*, or of a dark-brownish or blackish hue, *morphœa nigra*. Moreover, morphœa alba admits of a secondary division, from presenting two varieties, one in which there is induration of the skin, from deposition in its tissue of a lard-like substance, *morphœa alba lardacea, vel tuberosa;* the other being distinguished by atrophy of the skin, and by a greater degree of insensibility, *morphœa alba atrophica, vel anæsthetica.*

MORPHŒA ALBA LARDACEA.

Morphœa alba lardacea, vel tuberosa, presents itself in the form of one or several circumscribed patches, varying in size from a crown-piece to several inches in extent, and may occur on any part of the skin. The surface of the patch is uniform with the cutaneous integument, being neither elevated nor depressed, but remarkable for its marble-

like whiteness, smoothness, and polish. It is more or less dense and hard, and frequently roughened on the surface by a slight desquamation of dried-up cuticle. Its hardness and density serve to isolate it from the surrounding skin as completely as its color, and when it occurs in small patches, it has the appearance of being inlaid in the skin. When recent, the edge of normal skin immediately surrounding it presents a delicate lilac blush; but in cases of long standing no such border exists.

The smoothness, whiteness, and polish of the morbid skin, all proceed from the same cause, namely, infiltration into the tissue of the skin, or deposition within its cells, of a white, semiopaque substance, very much resembling *lard*. The skin looks as if it were injected with lard, and so distended as to obliterate the usual markings of the cuticle; the wrinkles of the surface, if any exist, being produced by the folding of the skin during the motions of the body. Another cause of the whiteness of the skin, is the absence of the capillary plexus, and the almost total absence of bloodvessels. Sometimes if the patch be large, a small vein may be seen gathering its tributary venules here and there, and sinking into the deeper structure, but the smaller patches look as if the skin were dead. Indeed, the deadness is not confined to appearance alone; the patches are more or less deficient in, and sometimes entirely devoid of, sensation, showing that not only the bloodvessels have become obliterated, but the nerves themselves are destroyed. In addition to these characters the patches have a peculiar baldness of appearance; they are either devoid of the usual downy hair of the skin, or the hairs are bleached and imperceptible, and with the absence of hair formation, there is also an absence of the secreting function of the skin.

The white patch of morphœa is often in a state now described, when first observed by the patient, but it always begins as an erythematous spot. When seen from the beginning, the spot is of small size, not larger than a fleabite, but in a few days it increases to the dimensions of a crown-piece or the palm of the hand. The redness is altogether unlike that of common erythema; it is never vivid, and scarcely exceeds a delicate lilac blush. The redness continues for some days or weeks, and then without any other perceptible change, the skin corresponding with the lilac blush becomes blanched, and constitutes the kind of patch just described. The blanching process begins in the centre of the patch, and the redness then forms an areola around it, the areola being gradually narrowed until it becomes a mere border or rim, generally slightly raised, and at last fades away altogether. The development of the erythematous spot is usually accompanied with a feeling of tingling, like that occasioned by a pressure on a nerve. Sometimes this sensation is sufficiently powerful to attract the attention of the patient, and give him annoyance; at other times it is scarcely appreciable.

The size and number of the patches is very various. I have seen a number clustered together about the neck, each no larger than a lentil. A common and usual size is that of a crown-piece or the palm of the hand; and I have seen one patch occupy the greater part of the thigh.

The limb had the appearance of a piece of beautiful marble sculpture, highly polished. One felt tempted to touch it, it looked so white and smooth, to be convinced that it was not marble; and one was astonished to find that though so lifeles in appearance, or resembling only living marble it gave the sensation of warmth. I recollect expressing my astonishment in looking upon that limb; and, upon asking some question, the gentleman smiled, and said that it gave him no inconvenience, and if it were not for the appearance, he should not know that it was there. The patches rarely exceed three or four in number; they are more frequent in women than in men; and their common seat is the superclavicular region of the neck, the chest just below the mammæ, the front of the abdomen, and the thighs. I have a patient now under treatment who had a patch on the forehead and nose, in which the morbid skin became shrunk and atrophied, and resembled a piece of dried white leather, perforated with small holes as if worm-eaten, and equally insensible.

My friend Mr. Samuel Wood, of Shrewsbury, writing to me lately, says: "I have under my care, in the Infirmary, a woman aged thirty, suffering under a peculiar cutaneous disease. Under each mamma, the skin has deposited in it a sort of wax-looking secretion. The part bears a strong resemblance to a recently blistered surface on a dead body, only the cuticle remains, and there are minute bloodvessels ramifying over several parts. The edge is slightly raised, and beyond this there is a slight blush. The size of the patch on the left side is four inches long by three broad. It has been slowly progressing for about twelve months. There is little pain, but an occasional burning heat."

Mr. C. Wilson Steel, of Lewisham, writing to me about the same time as Mr. Samuel Wood, says: "My patient is about thirty-five years of age, and has three children, the youngest being eight years old. She is of spare habit, active, has a soft, cool, but dry skin, rarely perspires, and enjoys good health. About seven years ago she perceived for the first time, a *white spot* on the back of the hand; subsequently, other spots appeared on different parts of the body, as on the abdomen, thighs, arms, &c.; indeed, they are dispersed more or less abundantly over the entire surface. The face is free, with the exception of a stripe along and underneath the lower lip. The whiteness is more apparent in contrast with the color of the rest of the skin in summer than in winter; and a new spot is preceded by a feeling of numbness and heaviness, which gives the patient warning of its occurrence. The spots do not attain any magnitude; and the spread of the disease takes place by new spots, which, when once formed, are permanent. They are distinguished from the surrounding skin, not by any raised margin, by any chap, ulceration, scurfiness, or other morbid condition visible to the eye; but simply by a *dead pearl-like whiteness*, bordered by an abrupt line, and exhibiting no transition, either on the side of the morbid or healthy skin. The spots are of various shape and size, and unaccompanied by sensation or pain, other than the premonitory numbness and heaviness already mentioned. In the winter the distinction between the white patches and the surrounding skin is not strikingly appreciable; but in the summer it is very evident."

In this country, at the present time, the disease, perhaps, never advances beyond the state of skin now described; it may become more extensive, harder, and more callous; but my experience does not enable me to say whether any other symptoms of elephantiasis follow upon this first step. I have observed several cases of morphœa alba lardacea for periods varying between two and ten years, and have seen no other symptoms arise. But in countries where elephantiasis still exists, particularly in hot climates, this form of morphœa is often the immediate forerunner of that serious disease.

MORPHŒA ALBA ATROPHICA.

Morphœa alba atrophica, vel anæsthetica, differs from morphœa lardacea not so much in degree of insensibility of the skin, as in the total atrophy by which it is attended. The patches are of the same figure and size, the skin as white, the lilac erythematous blush and the tingling sensation which precede, and the lilac border which surrounds them, the same; but there is no deposition of morbid matter in the texture of the derma, and consequently no marble-like smoothness, polish, and hardness; the lardaceous deposit is absent. In fact, the two forms of morphœa alba bear the same relation to each other as do the two forms of elephantiasis; morphœa lardacea belonging to the tuberculated, and morphœa atrophica to the anæsthetic form. From the absence of deposition in the tissue of the derma, and, as a consequence of defective nutrition, resulting from deficient innervation and circulation, the skin is thinner than natural, sometimes remarkably attenuated, and sunk below the level of the surrounding integument. Its glandular apparatus participates in the atrophy; there is neither sebaceous nor perspiratory secretion, and the part becomes bald from loss of hair. With this exception, the surface of the skin is unchanged; the linear markings are perfectly regular, but smaller than natural, and before the tint of color reaches the dead white of complete insensibility and atrophy, the patch has merely the appearance of being delicately fair and soft, like that of an infant, contrasting strangely with the often brown and olive skin which surrounds it.

Just as elephantiasis anæsthetica and elephantiasis tuberculata, being merely varieties of the same disease, may coexist, so morphœa alba atrophica may be present with morphœa alba lardacea, and sometimes the anæsthetic form precedes the deposition which subsequently takes place, and becomes a stage of the lardaceous variety. This is the case in a lady now under my care, who has six or eight patches of morphœa alba on the front of the body. Three of these, of longer standing than the rest, are distinctly lardaceous; one is dense and hard only in the centre of the white patch, the skin around it being natural in texture, and simply blanched; while several of the more recent patches are thin, soft, and white, and delicately fair in comparison with the tawny skin in which they are, as it were, inlaid.

Morphœa alba atrophica occurs for the most part on the front of the trunk of the body, particularly wherever the integument is thin, as beneath the mammæ, at the root of the neck, in the groins, and on

the inner side of the arms and legs. Three or four times I have seen it on the forehead, where it resulted obviously from paralysis of a branch of the supra-orbital nerve. It existed as a groove, about half an inch in width, in the direction of that nerve; the skin was white, shrunken, and insensible, the borders of the affected track being slightly raised, and of a lilac tint. In an advanced stage of the disease, the skin sometimes becomes shrivelled and dried up, like parchment; this is more particularly the case over a hard surface, as upon the head.

The following is an example of morphœa alba of the forehead occurring over the supra-orbital nerve, presenting itself in the first instance in the simple anæsthetic form, and subsequently taking on, in part, the lardaceous character. The patient first came before me in the winter of 1851, being then nineteen years of age, and stated that the disease had existed for two years. He first observed it after a fit of excitement, when the whole face was flushed, and contrasting with this flush there was a streak of white on the forehead, like the wheal of nettlerash or that produced by a whip, only that it was not raised. The streak began at the inner end of the left eyebrow, and ran upwards to the margin of the hair. After a short time he perceived that the white streak had become permanent; and still later, that a small circular bald spot of area (alopecia areata) had formed on the summit of the head, to the left of the middle line, and at some distance from the end of the streak.

In March, 1855, he consulted me for the second time; the white streak had now become a nearly straight white band, about three-quarters of an inch in breadth, extending from the inner end of the eyebrow to the summit of the head, and there joining with the original spot of area, now considerably increased in size. On the forehead the central part of the band was raised to the level of the adjacent skin, by the deposition in its structure of the peculiar lardaceous substance of tubercular elephantiasis. This deposit rendered the surface smooth and polished, obliterating the linear markings of the skin, and destroying its natural texture. And in place of the normal mottled redness produced by the capillary vessels, there was a coarse plexus of minute venules, the trunks of which dipped from point to point into the small spaces between the lobules of the morbid deposit. This venous plexus was not evenly distributed over the whole of the raised portion of the diseased skin, but was chiefly conspicuous in the central part, where it existed in small patches, and gave a reddish tint to the centre of the white. On either side of the elevated portion of the band, the morbid skin subsided below the level of the adjoining integument, and presented the characters of the atrophic form of the disease, pale, thin, and atrophied; no vessels whatever being perceptible in its structure. Beyond this groove, the surface gradually rose, and merged into the healthy integument, and the border of the sound skin presented the pale lilac elephantiasis blush which constitutes the ordinary limit of the patches of morphœa alba. We have thus brought under our eyes, as far as is possible in the living body, the actual process of the conversion of morphœa atrophica into morphœa tuberosa. Reach-

ing the summit of the forehead, the broad white band meandered through the hairy scalp to the top of the head, following the course of the supra-orbital nerve, and, where that nerve ends, terminated in a round patch of alopecia areata (morphœa alopeciata). The gently undulating course of this broad band suggested to the mind the idea of a river as represented on a map, flowing to the sea, or the flexuous progression of a serpent: hence, probably, the origin of the term *ophiasis* or *tyria*, applied by the ancients to this form of alopecia. The whole extent of the disease on the scalp presented the form of morphœa atrophica; the integument along the centre of the band and on the patch of area was so thin, that the finger seemed to touch the bone, and was perfectly bald, from the anæmic and atrophic condition of the skin. Along the sides of the band the integument rose to the level of the rest of the scalp, and was furnished with a few stinted, bent, and twisted hairs. The atrophic part of the morbid skin was deficient of sensation, but the tuberous portion was less so, and, compared with my observations four years before, had recovered some of its sensibility.

Besides the progress made by the chief patch of the disease upon the forehead and head, the patient called my attention, at his last visit, to a white, depressed spot, a few lines in diameter, which had appeared on the left side of the nose, a little below the inner angle of the eyelids; and further, to a similar appearance on the ala of the nose, which looked like a cicatrix, and had occasioned atrophy of the part. This latter had given rise to some little deformity, and had excited in his mind a not unnatural alarm for the safety of his nose.

I have mentioned that the disease appeared originally without any symptoms to denote its invasion; and during the whole period of its existence it has been the unsightliness of the patch, and not any suffering occasioned by it, which caused him anxiety. Except when excited by business, or his digestive functions are disturbed, he is not aware of any sensation in the part; but when any disturbance of circulation takes place from the causes referred to, he experiences a "heavy dead pain" around the edges of the patch on the forehead, and a prickling pain around those of the scalp.

On his visit to me in 1851 I prescribed for him iodide of potash in infusion of quassia, and the local application of the compound tincture of iodine. In 1852 he saw another surgeon, who called it "gangrene of the skin," and prescribed a gentle mercurial course, with the local application of a solution of the bichloride of mercury. In 1853 he was seen by Sir Benjamin Brodie, who advised him full doses of sarsaparilla, and local frictions with the strong citrine ointment. He does not appear to have given any of these means such a trial as could influence a disease so deeply rooted, nor to have given his adviser the opportunity of regulating or modifying the treatment from time to time. In April, 1855, he returned to me, when I ordered him the cod-liver oil, half an ounce twice a day, and five minims of Fowler's solution of arsenic, with the same number of antimony wine three times a day, and local friction with tincture of aconite in combination

with soap-liniment. As I have not seen him since, I am unable to report the success of this plan.

MORPHŒA NIGRA.

Morphœa nigra resembles in origin and general symptoms the two preceding forms, but differs from both in the conservation of the pigment-forming function of the skin, which is increased instead of being suspended, as in morphœa alba. The persistence of this function indicates a less degree of disorganization of the integument than in the two previous states; there is no condensation and hardening of the skin; and if there be thinning, it is present in a considerably less degree than in morphœa atrophica. The degree of insensibility is about the same or somewhat less than in the other kinds; the patches are rarely sunk below the level of the integument, but sometimes are rendered prominent by œdema. Patches of morphœa nigra were present in all the cases of elephantiasis which have come under my observation, but I have not seen it independently of that disease; sometimes the patches are round, and not larger than a crown-piece; at other times they may be as large as the palm of the hand; in one instance the body was spotted all over with them.

The tint of color in morphœa nigra presents some variety; it is sometimes a brownish-yellow, sometimes brown, and sometimes so dark as to approach to a blackish hue. The pigment does not seem to be confined to the surface of the derma, but extends into it for some depth, not only in the walls of the glandular apparatus of the skin, where it might be expected, but also in the interglandular portion. When any erythema is mingled with the discoloration, the patches have a purplish hue; the cuticle is for the most part smooth and shining, and sometimes acquires an almost metallic brilliancy; at other times it is roughened by desquamation. In early stages of the disease there is often an excess of sebaceous secretion united with the discoloration, which gives to the skin a greasy appearance, but later in the attack the patches are dry and devoid of secretion.

MORPHŒA ALOPECIATA.

Elephantiasis produces, as we have seen, a total disorganization and complete atrophy of the skin, and necessarily destroys the secreting functions of that organ; the perspiratory, sebiparous, chromatogenic, and trichogenetic functions are suspended or arrested, and the glandular and formative apparatus of those functions is atrophied, and ultimately obliterated. On the general surface of the body the patches of morphœa are smooth and bald, or the hair covering them is colorless or white; and when, as before related, the path of morphœa is situated on the head, the integument is greatly thinned, and the hair-follicles are destroyed.

In the case of morphœa alba of the general surface of the skin, I have shown that the pathognomonic characters of the disease are such as to point directly to elephantiasis as their source, and to leave no doubt on the mind that morphœa is a relic of that bygone scourge of

this country, the great leprosy; and I also believe that another affection, more common than morphœa of the body, namely, alopecia areata, is a morphœa of the scalp and hair-bearing skin; in other words, a morphœa alopeciata, bearing the same relation to elephantiasis as the morphœa already described.

The specific characters of alopecia areata, or, as I shall henceforth call it, morphœa alopeciata, are, loss of hair in a patch of circular, and sometimes, when taking the course of a nerve, of lengthened form (ophiasis, tyria); loss of sensation; loss of color, from arrested chromatogenesis and diminished circulation of blood; and thinning of the skin, more conspicuous at the centre than at the border of the patch, sometimes approaching to a real atrophy. The surface of the affected patch is smooth, from a greater or less degree of obliteration of the papillary structure of the derma, from shrinking of the follicles consequent upon arrest of their function, and from absence or diminished force of the linear markings of the skin; and it is less sensitive than natural, or totally insensible, from altered nervous function, probably a consequence of morbid alteration of structure of the nervous fibrils supplying the affected spot of the skin.

Morphœa alopeciata is apt to occur at all ages, and in all ranks of life, but is more common in young persons than in the adult. It is sometimes permanent, more frequently transient, but always tedious, lasting sometimes for months, and sometimes for years. When the hair returns it may assume all the qualities of healthy hair, or remain short, white, and impoverished. It appears usually in the form of one or more circular patches, from which the hair falls off at once and suddenly, leaving a bald spot of considerable size. Sometimes, however, its origin is small, consisting in the fall of a few hairs only, and it then increases more or less quickly by the circumference. At other times the loss of hair extends to the entire head, and involves, besides, the eyebrows and eyelashes. These latter cases are usually inveterate, though I have seen the hair return in several instances. But setting aside all these varied appearances, the one the most characteristic of the leprous disease, is that in which the spot is of inconsiderable size, the skin white, thin, smooth, and polished, as though stretched by shrinking, and devoid of sensibility and every trace of hair, the very follicles appearing to be obliterated.

In children and young persons we are apt, and with a semblance of reason, to refer this state of the skin to defective nutrition: and it no doubt does result from defective nutrition; but a defective nutrition originating in defective innervation, and the latter in the materies morbi of leprosy. In the adult this explanation is more obvious, since the period of active nutrition is over, and the insensibility of the skin points more directly to a local disorder of a nerve. A common seat of the morphœa in the adult is the chin, where the bald, white, circular spot contrasts strongly in color with the hair-bearing skin, and is peculiarly obnoxious to the sufferer.

It not uncommonly happens, that this local deficiency of action in a part of the skin is associated with general want of tone in the whole system, and the treatment demanded will call for the use of alteratives

and tonics. At other times I have seen benefit result from the use of mild mercurials, in combination with the iodide of potassium, where a syphilitic affection had to be controlled; but the special treatment for morphœa alopeciata consists of arsenic employed as a cutaneous stimulant and tonic, and local stimulants, such as acetum, cantharidis, compound tincture of iodine, liquor ammoniæ, solution of bichloride of mercury, &c. For morphœa alopeciata of the scalp, plentiful friction with the hair-brush, in addition to the stimulants already enumerated, is indicated, together with the use of a stimulating wash or pomatum. Where the scalp is denuded to a great extent, advantage is often gained by dipping the head in cold water, and exciting the skin afterwards by friction with a towel. In a few cases this state of the skin has been attended with general emaciation, quick pulse, and irritable temperament, when I have had recourse to cod-liver oil, in addition to the preceding local and alterative treatment. In general, the skin becomes restored to its natural appearance, and the hair returns, although the curative change is always slow and tedious; but occasionally, neither time nor treatment appears to have any remedial power over the affected skin, and the baldness becomes established permanently.

THE LEVITICAN CODE.

In further illustration of the nature of the true leprosy, or elephantiasis, it will be interesting to peruse the Scriptural account of this disease, contained in the thirteenth chapter of Leviticus, so frequently referred to by medical writers. The following appears to me to be an exact and accurate interpretation of this important chapter, so far as it treats of the diagnosis of leprosy:

1. And the Lord spake unto Moses and Aaron, saying,
2. When a man shall have an eruption in the skin *like* the eruption of leprosy, be it a tubercle, a scab, or a glossy spot; then he shall be brought unto the priest:
3. And the priest shall examine the eruption, and if the hair growing on the infected skin be changed in its color to white, and if the morbid alteration in the skin sink deeply into it, and appear to involve the entire thickness of the skin; then the case is one of leprosy, and the disease is contagious.
4. If the glossy spot be white, and affect only the surface of the skin, and the hair be not changed in color to white, then the priest shall seclude the patient for seven days;
5. And on the seventh day, if the spot remain as it was, and have not increased in extent, then the priest shall seclude him for seven days more;
6. And on the completion of another seven days, if the spot be somewhat dark, and have not spread, the priest shall pronounce the patient free from contagion; the case is one of simple *scab*.
7. But if the *scab* increase in size and spread, after he has been dismissed by the priest as free from contagion, he shall be again admitted to examination.

8. And if the priest find that the *scab* is still spreading, then he shall pronounce the case to be one of leprosy, and contagious.

9. When a man is affected with leprosy, he shall be brought to the priest;

10. And the priest shall examine him, and if he find the affected skin to be white and raised, and if the hair growing upon it be changed to white, and if there be an open sore [raw flesh] in the affected skin;

11. It is an old leprosy and contagious.

12. And if a leprosy invade the whole body from the head to the feet;

13. Then the priest shall consider, and even although the leprosy cover the whole skin, yet if it be all turned white [*lepra vulgaris*] he shall pronounce the patient free from contagion:

14. But if there be an open sore, then there is contagion;

15. For the open sore is a proof of contagion, and the case is a leprosy.

16. Or if the sore heal, and the skin become white, the patient shall come to the priest;

17. And if the priest be satisfied that the sore has healed and the skin is white, then he shall pronounce the patient free from contagion.

18. Even in the case of a common *boil* which is healed;

19. If there be a white tubercle, or a glossy spot, white or reddish in color;

20. And the priest find the whole depth of the skin to be involved in the disease, and the hair to be turned white, it is contagious, a leprosy broken out of the boil;

21. But if there be no white hairs, if it be quite superficial, and somewhat dark in color, then the priest shall seclude the patient for seven days;

22. And if it spread extensively in the skin, the priest shall pronounce it a contagious eruption.

23. But if the glossy spot remain, and spread not, it is a *carbuncle*, and the priest shall pronounce it not contagious.

24. Or, if in the inflamed patch of skin there be an open sore, and in the sore there be a glossy spot, either reddish or white,

25. And if the hair on the glossy spot be turned white, and the disease involve the entire depth of the skin, it is a leprosy broken out of the carbuncle; wherefore, the priest shall pronounce it contagious.

26. But if there be no white hair on the glossy spot, and it be not depressed below the level of the adjacent skin, but be somewhat dark in color, then the priest shall seclude him seven days.

27. And if on the seventh day it be spread to a considerable extent, then the priest shall pronounce it contagious; it is leprosy.

28. But if the glossy spot be stationary, and spread not, but be somewhat dark in color, it is an inflamed swelling of the carbuncle, and not contagious.

29. If a man or woman have an eruption on the head; or a man, on the hairy part of his face;

30. The priest shall examine it, and if he find that the disease sink

deeply into the skin, and the hair growing from it be yellow and thin, he shall pronounce the disease to be contagious, it is a *dry scall*, even a leprosy of the head or beard.

31. If, however, it be no deeper than the surface of the skin, and it be without hair, then the patient that hath the scall shall be secluded seven days:

32. And on the seventh day, if the scall be not spread, and if there be in it no yellow hair, and it affect only the surface of the skin,

33. The patient shall be shaven, but the scall shall not be shaven, and he shall be secluded another seven days:

34. And on the seventh day, if the scall be not spread, nor be deeper than the visible surface of the skin, then the priest shall pronounce the patient to be free from contagion:

35. But if after this the scall spread,

36. The priest shall examine him again, and if he find that the scall has really spread, he need not seek for yellow hair, the disease is contagious:

37. But if the scall continue stationary, and black hair has grown up therein, it is healed, and no longer contagious.

38. If a man or woman have in their skin glossy spots or white glossy spots,

39. The priest shall examine them; and if the glossy spots be darkish white, it is a freckled spot, and not contagious.

40. And a man may be bald, from the fall of his hair, without contagion.

41. And a man may be bald on his forehead without contagion;

42. But if there be on the bald head or bald forehead a white reddish sore, it is a leprosy:

43. Then the priest shall examine it; and if there be a white reddish tubercle like that which in leprosy appeareth on other parts of the skin,

44. He is a leprous man, and the disease is contagious.

Now the pathognomonic signs of leprosy, as described in this chapter, are: 1st, a glossy spot in the skin; 2d, the disease penetrating the entire thickness of the skin; and 3d, the hair growing from the affected skin being white or yellowish and faded; to which may be added, as signs of an advanced stage of the disease; 4th, a rising or tubercle of a whitish or reddish-white color, with or without fungous granulations (quick, raw flesh); and 5th, an ulcer (raw flesh). The favorable signs, on the other hand, are, spots of a dull white (*lepra vulgaris*), instead of glossy white, or glossy and dusky; the limitation of the disease to the visible surface of the skin; and the absence of any change in the hair.

Judging from the language employed in verses 3, 4, 21, 25, 30, 31, 32, 34, I am inclined to think that the Hebrews restricted the signification of the word "skin" to that part of the integument which at the present day we call *cuticle;* hence the distinction which is made between the visible surface of the skin, as in verse 4, and the entire thickness of the skin, the cutis or derma of modern writers, as in

verse 3. The text of the two verses is as follows: Verse 4: "If the bright spot be white in the skin of his flesh, and in sight *be not deeper than the skin.*" Verse 3: "And the plague in sight *be deeper than the skin* of his flesh." This distinction in reality constitutes one of the most important points of diagnosis between real leprosy and affections of the skin otherwise resembling leprosy; while, on the other hand, I can see nothing, either in the expressions used, or in any part of the chapter, to lead to the inference that a subcutaneous disease is implied.

In verses 20 and 21 some little difficulty is imported into the subject, by the apparent substitution of the word *lower* for *deeper*. Thus, if "in the place of the boil there be a white rising," and if "it be in sight *lower* than the skin;" but "if it be not *lower* than the skin," &c. It would seem by these words as if *depression* of the affected skin were implied, a condition distinct from depth, and having reference to the morbid alteration of the skin only in its effects as producing a disorganization and thinning of the skin, which actually does take place in elephantiasis; but the context is opposed to this signification of the word. A "rising" cannot be said to be "lower" than the skin; whereas lower than the skin may mean deeper than the apparent surface. I should have thought it unnecessary to dwell on this variation of terms, but for the fact that in a subsequent verse the perplexity is increased, inasmuch as the word *lower* can have no other meaning than *depressed*. Verse 26: "But if the priest look on it, and behold there be no white hair in the bright spot, and it be no *lower* than the other skin, but be somewhat dark, then the priest shall shut him up seven days."

Another observation to be made in connection with the 13th chapter of Leviticus, is, that the term "plague" is used synonymously with eruption; a plague of leprosy means simply an eruption of leprosy, while *leprosy* is employed as a generic term, and includes any spreading eruption, as well as the more malignant disease, elephantiasis or true leprosy. Thus, verse 8: "If the priest see that behold the *scab* spreadeth in the skin, then the priest shall pronounce him unclean; it is a leprosy." Again, verses 12, 13: "And if a leprosy break out abroad in the skin, and the leprosy cover all the skin of him that hath the plague, from his head even to his foot, wheresoever the priest looketh, then the priest shall consider, and behold if the leprosy have covered all his flesh, he shall pronounce him clean that hath the plague; it is all turned white, he is clean." The disease here referred to is evidently the lepra vulgaris of the present day, the boak or bohak of the Hebrews and the Arabians, the alphos of the Greeks, a known non-contagious affection.

If, in the next place, we inquire what are the forms of disease set down as varieties of contagious leprosy in the Levitical code, we shall find them to be *ten* in number, as follows:

1. A glossy spot (verse 2. Berat. *Heb.*) penerating the whole thickness of the skin, and on which the hair is white, is a contagious leprosy (verse 3. Tsorat, Berat lebena. *Heb.*)

2. A glossy spot, affecting the surface only of the skin, the hair remaining unchanged (verse 4; simple scab, verse 6), but spreading in the skin (verses 7, 8), is a contagious leprosy.

3. A glossy spot, white and somewhat raised, having within it a fungous-looking sore, the hair being white, is an old contagious leprosy (verses 10, 11).

4. A fungous-looking sore (verses 14, 15), occurring in a person affected with a white leprosy (boak) covering the whole body (verses 12, 13), is a contagious leprosy.

5. A white elevation, or a glossy white or reddish spot (verse 19), penetrating the entire thickness of the skin, on the site of a healed boil (verse 18), the hair of the affected skin being white (verse 20), is a contagious leprosy.

6. A glossy spot, either reddish or white, and accompanied with white hair, occurring in the midst of a carbuncle in course of healing, and penetrating the entire depth of the skin, is a contagious leprosy (verses 24, 25).

7. The same as variety 6, without white hair, not depressed, somewhat dark in color, but spreading (verses 26, 27), is a contagious leprosy.

8. A spot on the head or beard, accompanied by yellow, thin hair, and affecting the entire thickness of the skin, is a "dry scall" (verse 30), a contagious leprosy.

9. A spot on the head or beard, perfectly superficial, without change in the hair, but spreading (verse 36), is a contagious disease.[1]

10. A white, reddish, elevated sore, occurring in a bald person, and where the absence of hair excludes one feature of diagnosis, the reddish sore being like that which appears on any other part of the body in a leprous person (verses 42, 43, 44), is a contagious leprosy.

In other words, and more summarily defined, the *ten* varieties of contagious leprosy of the Levitical code are:

1. The Tsorat or Berat lebena, *Heb.;* Beras bejas, *Arab.;* Lepra leuce, *Gr.;* Elephantiasis Græcorum; the bright white leprosy, true leprosy.

2. A spreading scab; probably an eczema.

3. The Tsorat, with fungous sore.

4. Fungous sore in conjunction with lepra vulgaris; the latter being the Boak, *Heb.;* Lepra alphos, *Gr.;* dull-white leprosy.

5. White elevation, with other signs of Tsorat, issuing from the cicatrix of a boil.

6. The Tsorat, issuing from a carbuncle.

7. The dusky spreading Tsorat; the Berat cecha, *Heb.;* Lepra melas, *Gr.;* dusky or nigrescent leprosy.

8. A dry scall on the head or beard; deep.

9. A dry scall on the head or beard; superficial, but spreading.

10. A white, reddish, elevated sore on a bald person. A Tsorat, or Berat lebena.

Now, of the *ten* varieties of disease here designated under the generic term leprosy, it would appear that only eight deserve to be considered

[1] It is worthy of remark, that the word *disease* is used in this place (verse 36) instead of *leprosy*, although there can be no doubt, from the context, beginning with verse 29, that the disease leprosy is intended.

as the true leprosy or elephantiasis: namely, the *first*, which may be taken as presenting the specific type of the disease; the *third* and *fourth*, which add the fungous sore to the specific type; the *fifth*, being the specific type developed in the scar of a boil; the *sixth*, the specific type arising in a carbuncle; the *seventh*, a variety of the specific type distinguished by its dusky color; the *eighth*, a "dry scall," involving in morbid alteration the entire depth of the skin; and the *tenth*, being the specific type occurring on the head of a bald person. The remaining two varieties are, the *second*, a spreading scab, probably an eczema; and *ninth*, a "dry scall," affecting the skin only superficially, but exhibiting a tendency to spread. For the latter reason alone, namely, their progressive increase, they are classed with a contagious disease, as demanding, although not contagious in themselves, seclusion from healthy persons.

CHAPTER XIV.

DISEASES ARISING FROM THE SYPHILITIC POISON.

The diseases of the skin arising from the poison of syphilis or lues,[1] are the syphilitic eruptions or *syphilodermata*. These eruptions are to be considered as the manifestation of an effort on the part of nature to excrete or expel the poison of the blood through the skin; therefore, before entering upon their description, it may be desirable to glance at the phenomena of the syphilitic poison.

It is a well-known law of animal poisons, that, being once introduced into the blood, they excite in that fluid an action which has for its object the production of a similar poison, and this process goes on until the blood becomes saturated or overcharged with the morbific principle. As soon as this latter condition occurs, an inflammatory movement is set up, which results in the ejection or elimination of the poison.

This inflammatory movement, or syphilitic fever, is therefore a sign of the accumulation of the poison within the blood to such a degree as to disturb the healthy functions of the body, and is attended with symptoms which indicate derangement of the nervous, vascular, and digestive systems, and especially of those surfaces of the body through which it is possible for elimination to occur.

The blood is charged with a poisonous principle, and all the organs and structures supplied with that blood suffer to a greater or less extent. The brain evinces its suffering by mental dejection; the nerves, by a general feeling of prostration and debility. Everything is *couleur de plomb* around the patient; he is unable to pursue his avocations with comfort, and if they require the exercise of his mind, scarcely at all. He is oppressed with a sense of impending evil. Besides the lassitude and languor which evince the poisoned condition

[1] Der. Lues, ab λυω, solvere, dissolvere.

of the nerves, there is often neuralgia to an intense degree, sometimes affecting the head or face, and sometimes the joints, when it goes by the name of rheumatism. The neuralgia presents the peculiarity of being nocturnal, that is, of being most severe during the night, and often, but not always, entirely absent by day. The pulse is quickened; the tongue is coated, white, broad, and indented by the teeth. The fauces are more or less congested, the tonsils and soft palate being frequently swollen; there is irritation of the larynx, producing a mucous cough, and often nausea. The bowels are sometimes constipated, sometimes relaxed; the urine sometimes clear and limpid, at other times loaded with salts. The conjunctiva is congested and muddy, and the whole skin remarkable for its yellowish and dirty appearance, looking as if saturated with impure and discolored humors. Sometimes it is dry; at others, suffused with a greasy secretion; and at night, pours out an abundant and fetid perspiration.

Such are the general symptoms of the syphilitic fever, or secondary syphilis, but they may not all be present, and those which exist may be complicated by local congestions of the mucous membranes. The symptoms which may be selected as pathognomonic of syphilitic fever are, mental and nervous depression and prostration; congested fauces with sore throat; congested and muddy conjunctiva; congested and discolored skin, the congestion being partial or general, and assuming the form of an eruption; and added to these, neuralgic pains.

In this combination of symptoms, we are forcibly struck with the resemblance which they bear to those of the exanthematous fevers, measles, scarlatina, and small-pox. Firstly, the nervous depression, showing the stagnating influence of the accumulated poison. Secondly, the congestion of the mucous membrane, particularly of the fauces, showing the effort made by the bloodvessels to eject the poison through that tissue. And, thirdly, the cutaneous exanthema, which completes the triumph of the pressure from within, and is the sign that the poison is driven to the surface and is in process of expulsion.

Even the irregular symptoms, the partial and local congestions, have their parallel among the exanthemata. Let me adduce one or two examples. A printer, aged fifty, six weeks after suspicious connection, was exposed, in the winter season, to the dangerous effects of a heated and impure atmosphere during the day, and cold and rain at night. At this time he became the subject of nocturnal headaches, attended with profuse fetid perspirations. One night, after more fatigue and exposure than usual, his headache was excessively severe, his breathing oppressed, he had intense pain in his chest, and seemed in danger of suffocation. These symptoms of pulmonary congestion, an effort on the part of nature to eliminate the syphilitic poison through the mucous membrane of the air-tubes, were relieved by a general eruption of roseola.

A married lady had for two years been subject to a troublesome bronchitis, which the usual means had failed to cure. It came on at first in the form of periodical attacks, and was attended with serious dyspnœa. Latterly, the disease had become more constant and less severe. Her application to me arose from her having an eruption on

the forehead, which I recognized as syphilitic. The eruption had appeared with the first attack of bronchitis, and in her own mind, she connected the disorders together. It occurred to me also, that the two disorders might proceed from the same cause; that the bronchitis, like the cutaneous eruption, might be maintained by the syphilitic poison. I treated this lady as I should have done an ordinary case of constitutional syphilis, and both affections got well together.

Thus far for resemblances to the exanthematic fevers; but there are also differences between the syphilitic fever and that of the exanthemata, so remarkable as to call for special consideration. The exanthematous fevers are more violent, more regular, and more transient than the syphilitic fever; in other words, they are *acute*, while the syphilitic fever is *chronic*. It is true that instances of syphilitic fever often happen, which present all the symptoms of the most violent fever, and are attended with delirium; but such cases are the exception, and not the rule.

The cause of the differences of character perceptible between the exanthematous and the syphilitic fever appears to me to be due to a radical difference in the nature of the poison. The poison of measles, scarlatina, and small-pox, probably originates in conditions extraneous to the animal body; it reaches the blood as an element foreign to its nature, and as soon as it has accumulated to the saturating point, a violent effort is made for its expulsion. The expulsive effort obeys rigidly certain laws of order and time, and the poison being once removed, the blood of the patient may enjoy an immunity from a re-excitement of the same action for the rest of life.

How different are the phenomena which characterize the poison of syphilis. The syphilitic poison originates in the human body; it is probably little more than a modification of the natural secretions; it is consequently less irritant in its nature; and it tends to assimilate with the blood and with the tissues, rather than to excite an action which may result in its removal. Hence the poison is slow in accumulating; its excitation of febrile symptoms seems rather a matter of accident than the consequence of an irresistible law; the patient enjoys no immunity from a recurrence of the morbid action; and the poison is only partially removed by the febrile effort.

There is another striking difference between the exanthematic and the syphilitic poison. In the former, a second febrile attack never follows from the same original infection. In the latter, a second, a third, and, indeed, an indefinite succession of outbursts of the poison is the common manifestation of its action. In the exanthematic fever, the blood and tissues of the body are so modified by the excitation they have undergone, that they are indisposed to take on again a similar action. The poison of syphilis having once entered the system, the blood and tissues appear to become accustomed to its presence; it remains for years, or for life, and gives notice of its existence from time to time, by a variety of symptoms. Nay, more, it is transferable to offspring, not merely to one, but, as I believe, to an indefinite series of generations.

I have said that the occurrence of syphilitic fever seems rather the

effect of accident than the result of an immutable law. I mean, that the poison itself appears to be insufficient to light up the fever without the intervention of an accidental exciting cause, such as cold; and the exciting cause frequently determines the shape which the subsequent symptoms assume. Sometimes the leading feature of the fever is sore-throat, sometimes neuralgia or rheumatism, sometimes iritis, sometimes cutaneous eruption, and sometimes periosteal inflammation; these differences of effect being partly due to the nature of the exciting cause, and partly, also, to the constitution of the individual.

One of the most striking of the phenomena of the syphilitic poison, is the modification or alteration which it undergoes in its manifestations, under the mere influence of time. These modifications are expressed in the terms *primary*, *secondary*, and *tertiary*. With the morbid phenomena appertaining to primary syphilis we have nothing to do at present; as the syphilodermata all belong to secondary and tertiary syphilis, and principally to the former. Then the syphilitic poison undergoes another important modification, in consequence of being transmitted through the blood of the infected person, and being presented to a new person or to new blood, not in its crude shape, but as a modification. This latter phenomenon forms the basis of hereditary and infantile syphilis. Hence the syphilodermata admit of a primary division into *syphilodermata primitiva*, or syphilitic eruptions proceeding from the first poison; and *syphilodermata hæreditaria*, or eruptions resulting from the communication of the poison to the fœtus or infant. To these may possibly be added at some future period a class of *syphilodermata mitigata*, to include those modifications of syphilitic eruptions which are observed where the poison has passed through the blood of another, and is presented to a new person, in an assimilated condition, in the secretions of the infected individual.

Then, taking syphilodermata as divisible into these principal heads, we have next to consider the eruptions of the *first period*, or those which correspond with the so-called secondary syphilis; and the eruptions of the *second period*, or those of tertiary syphilis. In like manner, we have in syphilodermata hæreditaria, a *first*, a *second*, and a *third period*.

To render this classification of syphilitic eruptions more clear, I have arranged them in the form of a table, as follows:

I. Syphilodermata Primitiva.

First Period—

1. Syphiloderma erythematosum.
   - Roseola syphilitica,
   - Maculæ syphiliticæ.
2. Syphiloderma papulosum.
   - Lichen syphiliticus,
   - Lichen pustulosus.
3. Syphiloderma tuberculosum.
   - Tubercula syphilitica,
   - Tubercula ulcerantia.

4. SYPHILODERMA PUSTULOSUM.
   Rupia syphilitica.
5. SYPHILODERMA PILARE.
   Alopecia syphilitica.
6. SYPHILODERMA UNGUEALE.
   Onychia syphilitica.

SECOND PERIOD—

1. SYPHILODERMA ERYTHEMATOSUM.
   Erythema (vel psoriasis) palmare et plantare,
   Lupus erythematosus.
2. SYPHILODERMA TUBERCULOSUM.
   Tubercula mucosa,
   Tubercula ulcerantia, superficialia,
   Tubercula ulcerantia, profunda,
   Lupus ulcerosus, syphiliticus,
   Tubercula gummata.
3. SYPHILODERMA ULCERANS.

II. SYPHILODERMATA HÆREDITARIA.

FIRST PERIOD—

1. SYPHILODERMA ERYTHEMATOSUM.
   Erythema syphiliticum infantile.

SECOND PERIOD—

2. SYPHILODERMA TUBERCULOSUM.
   Lupus syphiliticus.

THIRD PERIOD—Lepra.

SYPHILODERMATA PRIMITIVA.

FIRST PERIOD.

Secondary Syphilis.

SYPHILODERMA ERYTHEMATOSUM.

ROSEOLA SYPHILITICA.

Roseola[1] is one of the simplest of the forms of constitutional syphilis, and presents the common characters of an exanthematous fever, usually of a mild kind, but sometimes severe. It is the form in which the general effort for the elimination of the syphilitic poison is manifested; is indicative of a certain power on the part of the collected poison; and is the common precursor of the other forms of eruption. The period at which it makes its appearance is between six and nine weeks after the development of the primary disease.

Like measles, which it closely resembles, it begins with general febrile symptoms, prostration of strength, and congestion of the mucous membrane of the fauces. Then follows the exanthem, which is spread more or less extensively over the surface of the body, being most perceptible on those parts which are covered by the clothes.

[1] Portraits of Diseases of the Skin, Plate XXIV., P.

The efflorescence remains apparent for a variable period, a few days or as many weeks; it is brightest in the evening and under the influence of excitement, and is attended, on its decline, with exfoliation of the cuticle. Very commonly it leaves behind it a fawn-colored or brownish stain, and a dry and sordid state of the skin.

Roseola syphilitica commonly presents itself in the form of undefined patches, giving to the skin an appearance which is best described by the term "mottled," *roseola versicolor*. The appearance is identical with that of common idiopathic roseola, or measles, and is due, like the two latter, to the manner of distribution of the bloodvessels in the skin. Perhaps the congested patch represents the ramifications of a single small arterial trunk; perhaps it embraces that small capillary system which is normally emptied by a separate venous trunk; perhaps, again, it includes the small district of skin, the circulation of which may be governed by the ultimate divisions of one small nervous twig.

Occasionally, the roseolous congestion is defined in its boundary, forming *circular blotches*, *roseola orbicularis;* and when this is the case, it often exhibits a tendency to spread by the circumference, while it fades in the centre, and so gives rise to an *annulate form* of roseola, *roseola annulata*. This annulate spread of congestion of the skin is another peculiarity of that structure, which is universal, and which also depends, very probably, upon the distribution of nervous influence. Syphilitic roseola, therefore, may present itself to our examination under three varieties of form, namely, as a patchy and mottled redness, as circular blotches, and as congested rings.

Besides the varieties which depend on differences of form, there are others which are due to *degree* of congestion of the skin. In some the redness of the blotches is uniform, or nearly so; others seem to deserve the appellation *punctated*, from the more vivid redness and greater congestion of the follicular plexus of capillaries, *roseola punctata;* and in a third case, the latter condition has progressed so far as to lift up the follicular pore, and produce an indistinct papule, *roseola papulata*. These differences, however, are mere differences in degree of congestion; the same morbid action exerting itself with greater or less force, or operating against a structure of greater or less strength; they are mere varieties of roseola, while roseola is only a variety or stage of the other forms of syphilitic eruption.

When the congestion of syphilitic roseola subsides, it leaves behind it a more or less stained appearance of the skin, and this is a common character of all the syphilitic eruptions. The stain generally corresponds with the form of the eruption which preceded it, and is of a brown color of varying tint; deep, and almost approaching to black in persons of dark complexion; of lighter hue, and verging to fawn, or a dead-leaflike tint, in the fair. Sepia, tinged with red or yellow, would, in the hands of the artist, produce all the variations of color which the syphilitic stain presents. These stains of the skin are termed *maculæ syphiliticæ*. Sometimes the roseolous congestion which precedes them is so slight that they appear to be independent of such an origin; but this is not the case; they are always the effect of a con-

gestive action in the skin. Whether, therefore, the maculæ syphiliticæ are primary in their appearance; whether they are consecutive upon roseola, or consecutive upon other forms of syphiloderma, they may be classed under the head of erythematous congestions. One variety of maculæ I have had occasion to distinguish from the rest, under the name of *melanopathia syphilitica*.[1]

Taking a general view of syphilitic eruptions, they will be found to present two principal forms; the one being simply congestive, and unattended with elevation of the skin, the other presenting the obvious feature of elevation. To the *non-elevated* group belong roseola and maculæ syphiliticæ; to the *elevated group* the small pimples of lichen, and the larger pimples or tubercles of tubercular syphilis. These differences are, however, more apparent than real, and may be regarded as stages of development of the same disease. Roseola, by an easy gradation, is converted into lichen, or tubercular syphilis; and these latter, by simple subsidence, become syphilitic maculæ. Roseola papulata constitutes a link of transition between the *non-elevated* and the *elevated* form of the syphilodermata.

SYPHILODERMA PAPULOSUM.

LICHEN SYPHILITICUS.

When the eruptive force is sufficiently powerful to elevate the pores into distinct pimples, the case is one of lichen. It is no uncommon thing to find the mottled roseolous rash forming a base upon which the papules of lichen are developed; and their appearance, under these circumstances, seems to warrant the designation which I have given to the eruption, namely, *lichen corymbosus*,[2] for the papules in this case are grouped in clusters, varying from three or four to thirty in number, and suggest forcibly to the mind the idea of clusters of fruit.

Sometimes the lichenous papules, instead of being arranged in groups, are dispersed singly over the surface of the skin, constituting a *lichen disseminatus*;[3] and at other times they are packed almost as closely as the pores which they represent, *lichen confertus*.[4]

The transition of syphilitic roseola into lichen is so obvious, that it may be observed through every stage of its progress. A roseolous patch may be seen to develop papules by the mere swelling of the pores of the congested skin; and the small papules of lichen are occasionally converted into those larger elevations which are known as tubercles, by a sudden aggravation of the syphilitic fever, or from exposure to cold.

In a few instances I have seen the eruption of syphilitic lichen developed into the form of ring, constituting a *lichen syphiliticus annulatus*;[5] and a *lichen syphiliticus pustulosus* may be distinguished

[1] Portraits of Diseases of the Skin, Plate XXXIV., M.
[2] Ibid., Plate XXVI., AH.
[3] Ibid., Plate XXVIII, O.
[4] Ibid., Plate XXV, AL.
[5] Ibid., Plate XXVII., AN.

as resulting from a pyogenic action in the papule, the consequence of irritability of system, or depressed vital powers.

In a case of lichen corymbosus the papulæ offered some variety in point of size, those of medium bulk being about equal in magnitude to a millet-seed. They were of a dull red or purplish hue, and were collected into groups or clusters, varying in number from three or four to thirty. The majority of the clusters contained ten or twelve of these pimples; and, here and there, a few solitary ones might be observed dispersed among the clusters. The patch of skin on which the clusters were placed was slightly raised, wrinkled, and of a dull red hue. After a week of treatment the greater part of the pimples had subsided, and were each covered with a little, thin, brownish scale of desiccated epidermis; there was also an epidermal exfoliation from the altered skin which formed the ground of the patch. The patches had become brownish in hue, and contrasted strongly with the color of the adjacent skin, although the latter presented the muddy and yellowish tint of syphilitic cachexia. Some few of the pimples, however, still lingered, and contained at their summit a whitish pus, and here and there a single fresh pimple showed itself. At the end of another week every pimple was gone, and the ground of the patches was undergoing a general exfoliation.

In another case, one of lichen disseminatus, the eruption chiefly occupied the back and arms, but numerous pimples were scattered over the rest of the body and face. The pimples were large and isolated, of a dull red color, attained their full growth in the course of a few days, and then became filled at their summit, some with a turbid, sero-purulent fluid, and others with a whitish pus.

Another mode of termination of the pimples is sometimes met with, as in a case of disseminated lichen, in which the pimples on the face were of the usual yellowish red or copper color, which accompanies the syphilitic cachexia; they were large, prominent, and smooth, measuring one line in breadth by half a line in height, and rose abruptly from the unaltered skin. The aperture of a follicle was apparent on the summit of each, marking the seat of the inflammatory congestion to be the capillary plexus of the follicle. The summit was evenly rounded, not conical as in acne, and, unlike the latter, they were soft to the touch, and had no tendency to suppurate. At the end of a week they had a yellowish tint at the summit, which arose from the thickening and commencing separation of the epidermis, and still later they were surmounted by a small conical crust, of a dirty-yellow color, consisting of desiccated sebaceous secretion, and reminding one of the conical crusts of rupia. After a time the little cap of thickened epidermis fell off, or where the conical crust of concreted sebaceous matter had formed, this also separated, and the pimple gradually subsided to the natural level of the skin, leaving behind it a brownish stain.

In their growth, maturation, and decline, these pimples, therefore, offer three stages for consideration: in the first they are smooth and soft, and the color is vivid; in the second they are denser in structure, their color is dull, and they are surmounted by a small, yellowish

crust of hardened epidermis and sebaceous substance; in the third stage, they are declining.

SYPHILODERMA TUBERCULOSUM.

TUBERCULA SYPHILITICA.

The tubercular eruption differs from lichen only in the size of the little elevations which give it its specific character. In lichen they are mere pimples, averaging from half a line to a line in diameter, and representing the immediate circumference of one of the pores of the skin. Tubercles, on the other hand, have a minimum size greater than that of the pimples of lichen, the smallest measuring upwards of a line in diameter, while some that I have observed had a diameter of three-quarters of an inch, and even more. They include many pores, and often a considerable portion of the skin. In other and essential respects there is less difference between them; both result from the action of the syphilitic poison in the skin; both may be a mere transformation of roseola. I have already adverted to the transition of roseola into lichen, and roseola into tubercula; and the conversion of lichen into tubercula is by no means uncommon.

Tubercles present some differences among themselves in respect of color, form, density, and elevation; and they also differ in the manner of growth and arrangement. In point of color they are sometimes of a yellowish red, sometimes of that deeper hue which is known as "copper-colored," and sometimes purplish and brownish. In form, they are round, oval, or oblong, in the latter case being frequently crescentic in shape. In density they are sometimes soft and flabby to the touch, at other times firmer, but never hard; and, as regards elevation, they rarely exceed one or two lines, but are sometimes almost flat. In growth, they sometimes spread in irregular rings, and sometimes the separate tubercles have a tendency to assume the annular character; in one case the annular disposition being limited to a mere central depression (cupped tubercles), and in another extending to a perfect ring of considerable size.

The color of syphilitic eruptions is often referred to as a pathognomonic character, and it is quite true that they present in general a remarkable dulness of hue, such as would result from an admixture of brown, in various proportions, with the three primary colors, red, blue, and yellow. The early stage of development of the eruption is that which possesses the greatest amount of red; in its second stage, and even in the primary when developed in a languid constitution, the slower circulation of the blood through the capillaries, and the consequent carbonization of the blood, gives a bluish tint to the color, in other words, forms a shade of the secondary color, purple. In a third stage of the eruption, when the vascularity is subsiding, and renders visible the staining effects of the yellow element of the blood upon the tissues of the skin, the color approaches towards the secondary orange, or with less red becomes a grayish yellow. So that the same eruption, seen at different periods, may be a red of greater or less dulness, a purplish red, or a yellowish red; and the same differ-

ences of color may be distinguished in different individuals from the beginning of the eruption.

The color brown is called a neutral color, that is, it is neither red, blue, nor yellow; but at the same time a compound of the three. Hence the dirty hue of the skin in syphilitic cachexia is the result of the mal-composition of the blood, and consequently, of the secretions; the excess of blue is probably occasioned by the presence of a surplus quantity of carbon; and the yellow, by a surplus of the pigmentary principle which gives color to the serum, the urine, and the bile. The admixture of this brown color with the red and purple of common vascular congestion produces the dull or dirty red and purple above spoken of; and, in like manner, the bright, or rather clear, yellow stain of an ordinary bruise, would become a dull or dirty yellow by a similar admixture.

In making these remarks, I am supposing the red to be the archæus or predominating color; the eruption is primarily red, the red having a blending with blue on the one hand, and yellow on the other, but in both instances being rendered dull by the presence of brown. We have now to consider a series of tints in which the neutral admixture brown predominates. The brown may have an excess of blue in its composition, and be a *dark brown;* it may have an excess of red, and be a *red brown;* or it may possess an admixture of yellow in different proportions, and be an *orange brown* or a *yellow brown.* Now, of all these separate tints, the red brown with a slight admixture of yellow is that which most nearly approaches the hue of dull copper, and is, therefore, the type of the "copper-colored" eruption; the so-called copper color being, in fact, a *reddish yellow brown.*

I have felt the necessity of giving this explanation of the precise meaning of "copper color," from having observed that medical men were not agreed as to the color to which this name should be applied, and, consequently, that it was liable to be employed more loosely than is consistent with scientific accuracy. The copper color represents, in fact, a declining stage of the eruption, when the congestion is subsiding, and the yellow stain of the altered fluids of the skin shines through the purple of the blood. The "copper color," therefore, may have a greater or less amount of red and yellow in its composition, and be either a reddish copper color or a yellowish copper color.

As the copper color represents only a stage of an eruption, that eruption having probably passed through the tints of dull red, and dull purplish red, before it reached the reddish-yellow brown of copper color, it is clear that the term is objectionable, when taken as a pathognomonic sign of a syphilitic eruption. For if we see the eruption at any other period than that of its decline, the characteristic tint is absent.

In the loose manner of using the term "copper-colored," above referred to, I have frequently heard the dull purplish red, the muddy red, and the yellowish red, designated by that term. These colors, however, are by no means pathognomonic of syphilitic eruptions; they are commonly met with in chronic eruptions of other kinds; for example, in acne. Any one looking upon a case of indurated and

chronic acne, associated, as is commonly the case, where the eruption depends upon mal-assimilation, with a sallow and muddy skin, must be struck with the close resemblance of such an eruption to one of syphilitic origin. Indeed, I have often seen non-syphilitic eruptions possessing more of the dull and muddy hue, which is generally supposed to be characteristic of syphilis, than syphilitic eruptions themselves. The color of eruptions of the skin must not, therefore, be relied on as proof of their syphilitic nature, although it may be fairly taken as a pathognomonic character where other symptoms tending to the same diagnosis are found to be present.

Syphilitic tubercles present some varieties which have reference to obvious diversities of character of development. For example, some are collected into patches of variable size, and are distributed, more or less generally, over the surface of the body; they correspond in manner of distribution with the corymbose form of lichen; hence, I have named them *tubercula corymbosa.* Others constitute groups which are more or less solitary in their arrangement, and of variable size. The group is bounded by a distinct border of tubercles, which creep along the skin, and increase gradually the dimensions of the patch. The circumscribed character of such a patch suggests the name of *tubercula circumscripta.*[1] Others are scattered over one or several regions of the body as separate tubercles, *tubercula disseminata;*[2] in some, the tubercles merge into each other and form a smooth bank, which expands into the form of a ring, *tubercula annulata;* while others, again, belonging to either of the preceding groups, are apt to take on an ulcerative action, and establish a variety which may be distinguished as *tubercula ulcerantia.*

TUBERCULA CORYMBOSA.—In a well-marked case of *tubercula corymbosa*, the eruption consisted of soft, yellowish-red tubercles, with rounded summits, and but little raised above the level of the skin. The average size of the tubercles was one line and a half; when isolated they measured two lines, and there were some which reached four lines in diameter. They were dispersed irregularly over the surface of the skin, and had a general distribution in patches of various size and form; in some situations the patches being as large as the palm of the hand; in others, small, and scattered between the former. On a close examination, it became apparent that there was a prevailing disposition on the part of the tubercles to form circles or rings, and this character was discernible even in the large patches, which seemed to be composed of a number of rings confusedly clustered together. The rings varied much in size, some having a mere central depression, and measuring scarcely more than a quarter of an inch in diameter, while others had an ample area, and measured from an inch to an inch and a half. The tubercles presented some differences of appearance common to these eruptions during the progress of the disease. In the first instance, while the congestion was active, they were bright in color and perfectly smooth on the surface; when

[1] Portraits of Diseases of the Skin, Plate XXX., A B.
[2] Ibid., Plate XXIX., N.

the congestion was on the decline, they lost their brightness of hue, and looked faded and shrunk, the epidermis covering them having become opaque and wrinkled. Later still, the epidermis became dry, cracked around the circumference of each tubercle, and peeled off, leaving a fringe around their base, and sometimes a small scale, the last remains of the exfoliating cuticle, on their summit. When the tubercles subsided altogether, leaving behind them brown stains, the skin presented a very remarkable appearance. The stains formed a number of brown rings, edged with a narrow margin of cuticle, and inclosing a centre of natural skin. In this state the eruption would pass very well among the inexperienced for a declining lepra, and the broken laminæ of desquamating epidermis suggests a motive for considering it a squamous affection.

While the general characters of the eruption may be such as are now described on the body and limbs, it is not unfrequently considerably modified when developed on the face. Thus, in another case, the countenance of the patient was deformed by a tubercular eruption, of a dusky-red hue. On parts of the face, and particularly on the exposed portions of the neck, the eruption consisted of distinct rounded tubercles, of large size. On other parts of the face, the tubercles had the form of oblong mounds, more or less curved, and again, in other situations, formed complete circles. On the forehead, the tubercles appeared to have become blended together, so as to constitute one single tuberous mass, of irregular shape, which extended across the brow, from one temple to the other. This mass was of a dusky red color, with a tinge of yellow, which gave it a coppery hue, and there was a seeming transparency about it which made it resemble brawn, or a portion of coarse and thickened skin, in a state of œdema, from infiltration of a yellow serum. To the touch, however, the swelling was hard, and evidently occasioned by a thickening of the skin, and not by the infiltration of fluid.

The trunk, as far as the waist, and the arms, were covered with the eruption, the tubercles being more or less developed, and the corymbi more or less annular. In certain situations the tubercles were less fully formed, and appeared to be made up of a number of papulæ, very little larger than those of common lichen; and many of these smaller pimples, of a dirty hue, were scattered amidst the patches of eruption, or grouped around the clusters of tubercles.

On the lower limbs and lower half of the trunk of the body, the clusters of tubercles had subsided to the level of the skin, forming so many darkish-red or brownish stains (maculæ) of a circular form. Many of these maculæ were sprinkled over with the dark remains of the papules, or with deeper-colored spots, which indicated the pores of the follicles. The maculæ were, for the most part, dark in the centre, fading away gradually to the circumference, and in some situations had the appearance of the stains of a bruise.

The general surface of the skin was dry, sordid, and discolored, and presented the character so constantly met with in cutaneous syphilis.

TUBERCULA CIRCUMSCRIPTA.—The eruption of tubercula corymbosa is *general* and *acute;* the eruption of tubercula circumscripta belongs

to a later period in the existence of the poison, and is, consequently, *partial* and *chronic*. It occurs in patches, which vary in size from two to twelve inches in diameter; they are solitary or few in number, rarely exceeding six or eight; they consist of a confused assemblage of tubercles, among which there is an obvious tendency to assume a circular arrangement, and they are distinctly *circumscribed*, the boundary being formed by a line of tubercles.

The following is an illustration of tubercula circumscripta, appearing four years and a half after contagion; the subject was a man of thirty, and the number of patches seven, one large and six small. The large patch measured nearly eight inches square, and covered the greater part of the left side of the abdomen. It was composed, as were the others, of numerous dull-red tubercles, having an average measurement of two lines in diameter, dispersed, apparently, without order, upon a ground of a dirty brown hue, and bounded by an irregular and slightly raised margin; in several places the tubercles had a circular arrangement, the rings being more or less complete. The smaller patches, about two inches in diameter, consisted of an irregular ring formed by a slightly elevated, reddish margin, inclosing an area of a yellowish-brown color, over which the eruption had crept. Within this area the epidermis was somewhat more wrinkled than that of the surrounding skin; and in the greater number of the patches there were scattered here and there one or two tubercles, which remained in a chronic state, while the rest had disappeared.

In their irregularly circular form and marginate character, these patches bear a near resemblance to lepra in the state of retreat; even the scattered tubercles within the circles are met with in lepra. But there are certain strongly distinguishing characters between lepra and the leproid forms of cutaneous syphilis, namely, the coppery, or dull-red color of the latter, the yellow-brown stain which they leave behind on the skin, after their decline; the softness of the syphilitic tubercles, as compared with those of lepra; and, lastly and chiefly, the total absence of squamæ. In old syphilitic tubercles, the epidermis may frequently be seen in a state of exfoliation; but the thin, ragged films of exfoliating epidermis, peeling from their summits, are easily distinguished from the thick, circular, morbifically elaborated scales of true lepra. Moreover, in a syphilitic patch of the kind now described, the cuticle may generally be traced unbroken from margin to margin, over the whole surface of the diseased skin.

If the large syphilitic patches (two inches in diameter) be examined carefully, and at various stages, with reference to their mode of development, they will be found to originate in simple tubercles, disposed in irregular circles of four, five, or six. The skin, included within and between these tubercles, partakes of the morbid action; the tubercles become fused at several points, forming an elevated margin; and the margin extends by its outer lip, and increases the area within. In this way, a number of small rings, measuring about half an inch in diameter, and creeping onwards by their circumference, become blended so as to form a single patch. The onward growth is then taken up by the peripheral margin of the collective patch (hence its

irregular outline, and its obvious composition of segments of small circles), the tubercles and margins left within the greater margin subside more or less completely, by virtue of a tendency on the part of the disease to cease on the exhausted ground, and prey upon the juices of the neighboring untainted soil; and, after a time, nothing of the original elements of the disease remains—all is lost but the slightly elevated reddish margin, and its sombre leaf-brown area.

In a case in which there existed a single patch of large size on the shoulder, the eruption commenced as a mere pimple, which increased to the size of a split pea; some months afterwards, a second pimple appeared, and having attained the dimensions of a small tubercle both began to spread out, and assume a circular form; then one or two tubercles rose up between the rings, and connected them, and in the course of a month, the whole together completed a patch as large as a hand. The annular character of the patch was well marked, the boundary being formed of a broken line of confluent tubercles, which were flattened, and surmounted by a thin covering of dry and desquamating epidermis. There were several tubercles with desquamating summits within the areæ of the rings, and the skin forming the ground of the patch had a reddish brown tint.

When the patches of tubercles appear on the face and exposed part of the neck, they have a brighter color than elsewhere. This was the case in a woman, the side of whose face and forehead was covered with a patch of a bright copper color, which had continued in the same state, with very little change, for twelve months.

On their subsidence, the patches of tubercula circumscripta sometimes leave very little trace of their existence on the skin; at other times, they leave a brown stain; sometimes an injected state of the skin, and sometimes shallow pits. The copper color of the patches owes a part of its intensity to a magnified capillary plexus, and numerous meandering venules, which may be seen on a close examination of the skin. Often, the tubercles seem to possess the power of disorganizing the structure of the skin completely, without suppuration and without ulceration; hence, when they disappear, they seem to be absorbed, and with them that portion of the skin which they had assimilated to their own structure, and they leave behind them deep and permanent pits, and, where they are of large size and extent, strongly marked cicatrices. The vascular congestion and shallow pits, are both characteristic of the chronic form of syphilitic tubercular eruption of the skin.

TUBERCULA DISSEMINATA.—The disseminated form of tubercular eruption is *less acute* and *less general* in its eruption than tubercula corymbosa; thus evincing a later period of the poison, but more acute and more general than tubercula circumscripta; occasionally it has been met with conjoined with the former. The tubercles are larger than those of the clustered eruption, perfectly round, and but little elevated above the surface of the skin; in their appearance and elevation suggesting an appellation by which I once distinguished them, namely, tubercula lentiformia. In point of measured size, the medium diameter of the disseminated tubercles may be roughly stated

to be four lines, while that of the clustered tubercles is two lines and a half.

In the case of a young woman, aged twenty-two, the eruption of tubercles covered the face, neck, and upper region of the back, some few being scattered over the arms. They first appeared on the face, and gradually extended downwards. The tubercles were perfectly circular, isolated, and lentil-shaped, of a dull red, almost livid color, smooth and uniform in size, measuring about a quarter of an inch in diameter. On the neck, the tubercles were less numerous than on the face, but somewhat more prominent and larger, one or two measuring more than half an inch in breadth. On the back of the neck, and between the shoulders, were about fifty tubercles, for the most part isolated; some few, however, were grouped in pairs, and in two instances, a pair had become blended together. They were all exactly circular, and more prominent than those of the neck, but the most prominent, even here, measured only three-quarters of a line in elevation. In breadth,, the extremes of measurement ranged between one line and six (half an inch); the size of the greater number was five lines; the next common size measured two lines and a half; while below these were a number of smaller papules scattered among the rest, and representing either the common papules of syphilitic lichen, or the early stage of growth of the tubercles. The developed tubercles presented every degree of completion and decadence; some were smooth, others wrinkled, others beginning to desquamate, and in others, desquamation had advanced some stages.

In my observations on this case, I remarked that the tubercles are exactly circular in form, varying in size from one-quarter to three-quarters of an inch in diameter, very slightly raised above the level of the adjacent skin, evenly convex on the surface, and subsiding gradually from the centre to the circumference, which merges insensibly into the surrounding skin. In point of elevation and form, they have very much the appearance of split lentils laid upon the skin, only that they are much broader. Their color varies from a bright coppery red, to a dull, dirty crimson. Their epidermal covering varies with their stage of growth; in the first instance, when the tubercles are tumid, the cuticle is smooth, and they have a polished appearance; later, when the congestion of their vessels diminishes, the cuticle is wrinkled; and later still, the cuticle becomes loosened from their surface, cracks, and separates. Sometimes, but rarely, they pass into a state of ulceration, the ulcer commencing on the summit of the convexity.

The manner in which the exfoliation of cuticle commonly takes place from the surface of the tubercles is the following: the cuticle cracks in a circular direction, just within the boundary of the elevation, and then separates gradually from the surface beneath; the central piece separating towards the centre of the convexity; the peripheral piece separating towards the sound skin, and forming a kind of frill around its margin. A crop of tubercles may sometimes be seen presenting every gradation of this process of desquamation at the same moment. There are some in which the crack has just taken place;

others, in which the edge of the central piece has been worn away, and has become reduced to a small disk, occupying only the central part of the convexity; others, in which the central piece is entirely gone; some in which the peripheral portion is distinct; others, in which it is partly, and others, again, in which it is wholly, removed. The tubercle may now be left quite smooth, or secondary exfoliations may commence. The latter, however, are for the most part irregular and partial, and are not to be confounded with the primary exfoliation first described. When ulceration occurs, a crust is formed on the ulcerated surface; and, in proportion to the quantity of pus secreted by the ulcer, or the care with which it is kept, the crust may become very thick, or be a mere scale.

The tubercles of the disseminated variety of the syphilitic eruption are sometimes less distinctly round than those just described, less raised, and sometimes smaller, making it difficult to determine whether to class them under the head of roseola, lichen, or tubercula; but the elevation of the centre of the spots, although very slight, and the manner of exfoliation of the cuticle, generally determine the nature of the eruption when it belongs to the present group, assuming for the tubercles as a distinction from the "lentiform" kind, the designation of "flat."

TUBERCULA ANNULATA.—The type of the present form of eruption is a tubercle, which spreads in a circular direction, so as to form a ring of variable breadth. Sometimes the tubercle itself seems to enlarge and constitute the ring, leaving an area in which the skin returns by degrees to its natural state; at other times, the tubercle would appear simply to communicate the impulse of growth to the skin immediately about its circumference, a ring being formed around the tubercle, and gradually enlarging, while the tubercle remains stationary in the midst of the area. It is to this form of syphilitic tubercle that the term *syphilitic lepra* has been applied, and the resemblance is so great as to give a certain warrant to the error. The eruption is *sub-acute* and *partial* in its distribution, and appears to result from the agency of a modified poison.

In the case of a young woman who suffered under this eruption, the tubercles were scattered over various parts of the body, but were most numerous about the neck. They commenced on the fore-arm by two spots, and gradually extended, first to the neck and hips, and then to her limbs. On the neck the eruption presented every stage of progressive development. There were papules scarcely a line in diameter; tubercles, measuring from two to four lines; circular patches three or four lines across, with depressed centre, and raised border; raised and papulated rings from half an inch to one inch in breadth, of a circular or oval figure, inclosing in their centre a large and irregularly-shaped tubercle; and one or two rings with a smooth area.

Many of the patches were in the state of desquamation; the exfoliation of the cuticle being chiefly apparent on the summit of the central papules, and upon the convexity of the rings. The scales, however, were obviously nothing more than desiccated epidermis, and very

thin; and not, as in the case of lepra, epidermis altered in its anatomical structure, and thick and laminated.

Sometimes the central tubercle spreads with the ring, and the whole seems to form one broad, soft patch, the ring being distinguished from the tubercle by a mere groove. In one case there were several of these broad fleshy tubercular patches bounded by an abrupt border.

In another case, that of a young man of twenty, the entire number of spots or patches did not exceed twelve or fifteen, and were distributed upon the hips, thighs, and penis. Of two spots on the right hip, one was irregularly circular, the other oval; the former measured one inch and a quarter, the latter one inch and a half in longest diameter. They consisted of a central, broad, and fleshy tubercle, surrounded by a raised ring; both the tubercle and ring were of a deep, dull-red color, and the redness extended over the whole of the area included within the ring. The tubercle was wrinkled and smooth on the surface; the ring was marked by numerous transverse furrows, and was in a state of desquamation, the portions of desquamating epidermis corresponding in shape with that of the intervals between the wrinkles. On the right thigh there were four patches, one was a simple tubercle measuring one line and a half in diameter; it represented the first stage of growth of the patch; another was a raised, flat, oval-shaped tubercle, half an inch in diameter, and appearing, from the elevation of its border, to be slightly depressed in the centre; the remaining two measured an inch, and an inch and a half in diameter, were oblong and oval in shape, and had each a broad and irregular central tubercle. Of the three patches on the penis, the largest, measuring an inch in longest diameter, had a central tubercle; the other two were smaller, and mere rings, inclosing an area of brownish and slightly corrugated skin, over which the ring had crept in its onward growth.

The resemblance of these patches to those of lepra vulgaris was very striking, and I have no doubt that they would have been called lepra syphilitica by any one who had seen them; and yet their origin and mode of development was identical with that of tubercular syphilitic eruptions in general. They differed from lepra, however, in the absence of scales, an important point; and also in the presence of the central tubercle; the patches of lepra are depressed in the centre; these were more elevated in the centre than at the circumference.

In another example there was no central tubercle, and the eruption had more of the character of lepra vulgaris than the preceding cases. The patient was a medical student; he consulted me for an eruption, which he considered to be common lepra, and its appearance was certainly such that it might have deceived men of more experience than himself. On the lower limbs were fifteen or twenty large rings, of a medium size of two inches in diameter. The area of the ring was perfectly smooth, and of a yellowish-brown color; the ring itself was raised, of a dull-red color, and irregularly circular or oval in its form. On the side corresponding with the area, the elevated margin rose abruptly from the surface; on the peripheral side it declined gradually to the level of the surrounding skin. The breadth of the rings was between three and four lines. The surface of the rings

presented certain differences of appearance; in some, it was uniform and smooth; in others, the rings were marked by numerous transverse wrinkles; and others, again, were either papulated on the surface, or looked as if formed by the aggregation and fusion of numerous tubercles. There was a slight condensation of the cuticle covering some of the rings, and here and there an indication of epidermal exfoliation.

TUBERCULA ULCERANTIA.—One of the most striking of the peculiarities of syphilitic cutaneous disease, is the gradual and almost imperceptible transition by which one form passes into another. We have seen this peculiarity illustrated in the transition of roseola into lichen and tubercle; in the close alliance subsisting between the varieties of tubercles; and the same fact is perceptible in the gradual conversion of tubercles into ulcerations. These observations all point to the unity of the syphilitic poison; and the varieties evinced in the manifestation of the morbid effects of the poison, are such as might be anticipated from a knowledge of the varieties of constitution presented by mankind, and the varied conditions to which the poison must be subjected in its numberless mutations.

Even ulceration is presented to us in a transition state, in that curious phenomenon wherein a tubercle disappears, or is removed by absorption, and leaves behind it a deeply pitted cicatrix, without any external signs of ulceration being perceptible; sometimes a slight crust is formed on the subsiding mass; at other times, and especially under the influence of mercury, it sinks and is lost without a trace of change in its outward appearance. In another series of cases a thin crust covers the summit of the subsiding tubercle; if we remove the crust a little moisture of an ichorous nature may be perceived, perhaps a globule of purulent secretion. We might be inclined to admit that there was a slight abrasion of the surface, but scarcely that there existed a condition to which we could correctly give the name of ulceration. In a third series ulceration is unquestionable, but the nature of the ulceration of the *superficial* kind.

SYPHILODERMA PUSTULOSUM.

RUPIA SYPHILITICA.

The only eruption coming strictly under the denomination of pustular syphilis is rupia; an affection depending especially on a pyogenic condition of the constitution. Other forms of pustule must be considered as instances of suppurating papules and tubercles. I have myself fallen into the error of denominating a pustular eruption, produced under the impulse of constitutional syphilis, "impetigo syphilitica;"[1] upon further reflection I think it would have been more correct to have regarded it as a lichen passing into the state of suppuration. Such cases are by no means rare, and a pustular lichen may be fairly admitted among the occasional phenomena of that eruption. I recollect an instance in which the greater part of the papules developed on the arms and legs of a syphilitic patient were gradually con-

[1] Portraits of Diseases of the Skin, Plate XXXI., Y.

verted into pustules. The syphilitic ecthyma seems to me to be also doubtful, but not so positively unlikely as the production of smaller pustules. Even in the instance of ecthyma it is necessary that we should be well assured that the case is not one of suppurating tubercle.

Rupia[1] (Plate VIII.) is characterized by the eruption of small purulent bullæ or large pustules, which are few in number, dispersed, and surrounded by a narrow zone of redness. The bullæ contain, in the first instance, a serous or sero-purulent fluid, which speedily becomes purulent or sanguinolent, and concretes and desiccates into dark greenish or blackish rough crusts. These crusts are variable in point of thickness; the larger ones bear some resemblance to the shell of the oyster; whilst others are conical in their form, being thicker in the middle than at the circumference, and not unlike the shell of the limpet. When the crusts fall off they leave behind them atonic ulcers of a circular form and various depth, which secrete an abundant, ichorous, purulent, and fetid fluid, and are indisposed to heal. Rupia is tedious in its progress, and lasts for several weeks or months.

The varieties of rupia are founded on the extent and severity of the disease, and on the thickness and form of the crust; they are—

Rupia simplex, Rupia prominens.

RUPIA SIMPLEX.

Ecphlysis rhypia, Mason Good. *Sordid blain.*

In rupia simplex (Plate VIII., L, M, N), the purulent bullæ are circular in form, flattened on their summit, and equal in diameter to a sixpenny or shilling piece. When first developed, they contain an opaline fluid, which soon becomes purulent, and gradually concretes and dries up. As the secretion dries, the epidermis around it shrivels, and eventually forms a brownish, wrinkled crust, somewhat like the outside of an oyster-shell. The crust is thickest in the middle, and is continuous at the circumference with the epidermis of the surrounding skin. It is thrown off after some days, and exposes a red surface, or a superficial ulcer, which may continue for several days longer. In the latter case a new crust is formed by the desiccation of the secretion upon the surface of the ulcer, and a succession of crusts may in this way be produced. When the ulcer heals its seat is indicated by redness or lividity of the skin around the cicatrix, which endures for a considerable period. The more frequent situation of rupia simplex is the legs and lower parts of the body.

RUPIA PROMINENS.

The prominent rupia (Plate VIII., O) receives its designation from the projecting and conical form of the crusts which succeed the purulent bullæ. The pustules are of greater extent than in the simpler variety, and are followed by a troublesome ulcer of considerable depth.

[1] Der. ῥύπος, sordes.

Rupia prominens is preceded by several circumscribed patches of erythema or by tubercles, upon which the epidermis is raised slowly, and is distended with a turbid, dark-colored fluid. The fluid soon becomes concreted, and gradually desiccates into a thick and wrinkled crust of a brownish-black color. While the crust is proceeding towards completion, the erythema slowly extends its limits, so as to form a narrow areola around the circumference of the crust. Upon this areola the epidermis is raised, and a fresh secretion of purulent fluid takes place beneath it, which increases the breadth of the crust. In this manner, by successive secretions, extending each time beyond the limits of the first formed scab, the crust is gradually enlarged at its base, and raised more and more above the surface, so as to assume the characteristic form of the limpet-shell. From its mode of growth the crust appears to be formed of concentric layers, projecting one beyond the other like tiles upon a house-top, and when it enlarges in breadth more than in height, it bears a close resemblance to the scaly shell of an oyster. The crust goes on increasing for several days, sometimes for a week, and then becomes stationary. In this state it remains for a variable period, being at one time easily detached, and at another firmly fixed. When detached, either spontaneously or by accident, it is found to conceal an ulcer of considerable depth, and of variable extent, being deep in proportion to the duration of the crust. The ulcer, when thus exposed, sometimes secretes a new crust, which grows thick by successive additions from beneath. At other times, and this is the more frequent course, the ulcer retains its open form, presenting a foul surface, thin, livid, or pale, and excavated edges, and an inflamed areola. The ulcer is difficult to heal, and after the formation of a cicatrix, leaves a livid and purplish stain which continues for many months.

This form of rupia occurs both on the upper and the lower limbs, but more frequently on the latter. The bullæ are sometimes few in number, sometimes numerous and successive; usually, however, there is one only or a few at their height, while others may be threatening to appear or on the decline. Sometimes the pustular bullæ, instead of pursuing the tardy course described above, is developed quickly, and is filled with a lymph, which subsequently becomes opaque and purulent. In other instances, again, the inflammatory redness may be dissipated without the appearance of a bulla.

In rupia the pyogenic constitution may be idiopathic or accidental, or both, as in the case of a young man of twenty, who received the infection of syphilis while in a debilitated state from immersion in the water during the winter season. He had a chancre and suppurating bubo; the former healed readily, but the latter confined him to bed for nine weeks. Six weeks after inoculation a crop of red tubercles made their appearance on the face and head. The tubercles were round, as large as a split pea, and, after increasing in size for a few days, became filled in the summit with a bright yellow pus. Two or three days later the centre of the pustule had become brown, and was beginning to desiccate into a yellowish-brown scab. The margin of the scab, where it was continuous with the epidermis, was still yellow

from the effusion of fresh pus, while a narrow halo of redness indicated the inflamed skin around its circumference.

After another period of six weeks from the outbreak of the preceding attack, he was seized with sore throat and severe pains in the limbs, which increased at night; the fauces were much inflamed, and there was ulceration of the tonsils and pharynx. His face at this time was studded all over with yellowish-brown crusts; there were several on the scalp and a few on the limbs and back; altogether the number distributed upon the face and head amounted to sixty-eight.[1] The eruption presented itself in all its stages of development and growth: there were simple tubercles, others surmounted with yellow pus, and others covered with crusts possessing every gradation of growth. The crusts bore the aspect of being laminated; some were irregular; others were pretty evenly limpet-shaped; while a few were broken into small fragments, and had a mulberry-like appearance. Upon the eyebrows they had uprooted the hair and carried it with them, so that, on superficial inspection, they seemed tufted with hair. There was also some difference of color: in the most recently formed crusts a reddish-yellow predominated; the older ones were brown, with a tinge of green or yellow; and those which had been caught by the dress or by the bedclothes were black from being stained with blood.

The elevation of some of the crusts was three-quarters of an inch, and such crusts had generally the conical shape (Rupia prominens, Plate VIII. o), that particular form being partly the result of freedom from injury, and partly the consequence of the slow and gradual peripheric extension of disease in the skin. On the side of the cheek one of the crusts was thicker below than above, from gravitation of the imprisoned pus; and on the upper lip, near the margin of the prolabium, there were two, of a circular and conical form, which curved downwards to the mouth, and were not unlike the beak of a hawk. The largest of the crusts was situated on the front of the thigh, and measured nearly two inches in diameter; it was dark-colored from effusion of blood, and thin.

In its relation to the surrounding skin, the exterior pellicle of the crusts was continuous with the epidermis; this portion of the pellicle was of a lighter color than the rest, and covered a layer of newly-effused pus. By a little pressure the pellicle in this situation might be broken through all round, and by a slight increase of force, the crust might be removed entirely, showing it to be a hollow cone filled with a thick and tenacious pus, and based upon an indolent and unhealthy ulcer.

The ulcers which constitute the base of the crusts of rupia have been aptly termed "atonic." When they have made but little progress in depth, they present a coarsely granular surface, interspersed with irregular patches of undestroyed skin. A little later, when the ulceration reaches the deepest stratum of the corium, the tissue of the latter may be detected among the granulations, forming an open net-

[1] Portraits of Diseases of the Skin, Plate XXXII., W.

work; while, at a still later period, the corium is entirely destroyed, the exposed subcutaneous tissue is frequently smooth, or the granulations are few and scattered, and the hollows are filled with whitish and yellowish lymph. The edges of these ulcers are generally pale and smooth, without being raised, and they are undermined to a greater or less extent. When the ulcers of rupia heal, they leave behind them ugly cicatrices, with more or less of a purplish hue of the skin, and often a brownish stain.

SYPHILODERMA PILARE.

ALOPECIA SYPHILITICA.

The fall of the hair, alopecia, sometimes follows the syphilitic fever, in the same manner as it is met with as a sequela of measles, scarlet fever, or fevers of any other type. Under the influence of the constitutional actions present in these fevers, the formation of the epidermis and hair is temporarily suspended, the epidermis as a consequence exfoliates, and the hair falls. Where the fall of the hair is a chronic action, it probably depends upon insufficient nutrition of the skin; a condition especially characteristic of the syphilitic cachexia.

In a disease so important and serious as constitutional syphilis, the fall of the hair, even as a symptom, is not calculated to excite more than a passing notice. If it be sought for, it will be found very frequently; but occasionally it is brought under our attention by the immediate inconvenience to which it gives rise.

I am often consulted for alopecia where syphilis is not suspected, and in these cases I subject my patient to a careful scrutiny for the detection of any symptom which might indicate its dependence on the syphilitic poison. Sometimes I have succeeded in discovering such a symptom, however obscure, and then the treatment applicable to constitutional syphilis has been remarkably successful. In one case the concurrent symptom was a tendency to neuralgia; in another, a muddy skin, with occasional sore throat; and in a third, a milky spot or a fissure on the tongue.

The following is an example of alopecia, depending on syphilis: A gentleman contracted a venereal sore, the nature of which was doubted at the time by his medical attendant, and a week was allowed to transpire before he commenced taking mercury. He then took blue pill until his mouth was affected; the sore healed in three weeks. Three months after the sore, his hair began to fall off in considerable patches, and a month later he had sore throat. On the occasion of his visit to me the hair was falling abundantly, it was parched and shrunken as if dead, and the scalp was dry and scurfy. Upon examination I found the stain of a syphilitic tubercle on the nape of his neck.

SYPHILODERMA UNGUEALE.

ONYCHIA SYPHILITICA.

The matrix of the nails is not unfrequently affected by redness, swelling, suppuration, and often ulceration, under the influence of the

inflammation of syphilis, and the case is one of syphilitic onychia. Sometimes one finger or toe alone is attacked, at other times several may be affected at the same moment. The skin immediately around the nail is considerably puffed and swollen, often the whole extremity of the finger or toe is enlarged; suppuration and superficial ulceration occur between the skin and the edge of the nail, fungous granulations are formed, which partly overlap the nail; the suppuration extends beneath it, and the nail is, in consequence, more or less loosened. This state of disease is excessively painful, but quickly gets well under the influence of general remedies.

SYPHILITIC DEGENERATION OF THE NAILS is also met with occasionally as a consequence of the presence of the syphilitic poison in the blood. The nails are apt to be altered in structure, they are discolored and brittle, thinner or thicker than natural, and rough and fibrous in texture. Sometimes they fall off, and are succeeded by others more faulty than themselves, and sometimes this morbid condition of the nails is accompanied with erythema of the matrix, or of the skin immediately bordering the edge of the nail.

SYPHILODERMATA PRIMITIVA.

SECOND PERIOD.

Tertiary Syphilis.

The effects of the syphilitic poison on the human constitution are so altered and modified by time, that the distinction of the constitutional symptoms of syphilis into secondary and tertiary is universally recognized. It does not, however, follow, that these are necessarily connected with each other in the order of their apparent sequence; for the secondary or constitutional disease may be present without any primary disease having existed; and the tertiary symptoms may be evolved without the intervention of any secondary affection. Nor does time necessarily bring about similar changes in similar periods; the effects, besides being modified by time, also subserve the powers of constitution of the individual, and are consequently developed more rapidly in one person than in another. Again, the primary symptoms sometimes merge into the secondary, and the secondary pass so gradually into the tertiary, that it becomes often difficult to draw with certainty a line between them. These considerations must always be borne in mind in our observation of this class of diseases, and our diagnosis as to the period of the disease must be founded, not merely upon time, but also upon decided pathological characters.

The syphilodermata which belong to the *second period*, that is, to the period of tertiary syphilis, may be arranged under three heads, according as they present, in chief, the characters of erythema, of tubercle, or ulcer. To the *erythematous group* belong, psoriasis palmaris et plantaris, and an erythema which occurs for the most part on the face, lupus erythematosus. Under the head of *syphiloderma tuberculosum* are to be considered, tubercula mucosa, tubercula ulcerantia, superficial and deep, lupus ulcerosus, and tumores gummati;

while the *syphiloderma ulcerans* exhibits one of the destructive attributes of syphilis when the latter has gained long possession of the system.

ERYTHEMA PALMARE ET PLANTARE, SYPHILITICUM; VEL, PSORIASIS PALMARIS ET PLANTARIS SYPHILITICA.

Erythema palmare commences usually in the middle of the palm of the hand, in one of the grooves of flexion, as a reddish spot, over which the cuticle becomes hard and yellow, from destruction of its vitality, and soon after cracks and exfoliates, leaving a red surface beneath, covered by a new epiderm. Sometimes this process commences at the same moment in both hands; sometimes it exists in one only; sometimes it takes place in the soles of the feet as well as in the palms of the hands. Often there is only one of these dry, red, cracking, uncomfortable patches on the hand; at other times, there are several; for example, around the ball of the thumb, on the wrist, in the lines of flexion of the fingers. The exfoliating erythematous patch may continue in the state now described for weeks, months, or years, with little or no change. Sometimes it exhibits a tendency to spread, and then it creeps slowly along the fingers to their tips, along their borders, around the borders of the hand, or upwards upon the wrist. Occasionally, and less frequently, it reaches the back of the hands and back of the fingers, and I once met with a case in which its principal seat was the back of the hand. But whether it be partial or general in its attack on the hand, it is always the same red, inflamed, hot, cracked, exfoliating surface; sometimes, but rarely, the tender derma, newly exposed by the peeling off of the skin above, cracks, then a little blood escapes, and the crack heals; sometimes the dry, cracked cuticle is the cause of the fissure of the skin; rarely, a little suppuration takes place.

Sometimes the patch exhibits a tendency to enlarge by centrifugal growth, *erythema palmare centrifugum*, vel *psoriasis palmaris centrifuga*, and presents the annulate character already referred to under the head of syphilitic tubercles. In the case of a centrifugal growth, the border is defined, the area presents the red, dry, cracked, and exfoliating character above described. The ring may be small or large, running out upon the fingers in one direction, and upwards upon the wrist in the other. As soon as it becomes stationary, a new inflammatory action may begin in the centre of the ring, and a second, a third, and a fourth ring may be formed in succession, affording a curious and remarkable example of cutaneous disease.

Sometimes the ring possesses a tubercular character, and is slightly raised, is, in fact, an instance of the annulate tubercle in the palm of the hand. I have delineated a case of this kind in my *Portraits of Diseases of the Skin*, under the name of erythema annulatum palmare.[1] I had not at that time detected the syphilitic nature of the affection, and had only seen one or two cases; I have examined many since,

[1] Plate XIX., K.

and with a slight alteration in the arrangement of the words, I think I may still retain the name I then gave to it, namely, *erythema palmare annulatum.*

The erythema palmare annulatum syphiliticum differs from the forms previously described, by getting well in the area while the circle expands. The circle may remain for a long time cracked and angry, but the area recovers its healthy structure and appearance completely.

In a case of erythema palmare of one hand, with syphilitic tubercles on other parts of the body, the disease of the palm was a circular ring, the epidermis being hard and dry, and slightly raised, and the area of the ring dry and cracked. The patient had several such rings of small size on his wrist, a half circle on the breast, and a large broken circle with a cluster of scattered tubercles within its area, on the buttock. These eruptions had been in existence for ten years; that on the hand had got well and broken out repeatedly, but the patch on the buttock had continued from its first appearance, being sometimes better, and sometimes worse.

In another case, one of erythema palmare centrifugum,[1] with a similar affection of the skin of the penis, the eruption occupied the whole of the palmar surface of the hand and fingers, extending partly to the back of the latter. The leading features in the appearance of the hand, were, a vivid redness of the entire surface, bordered by an abrupt margin of a deeper red than the rest; a swollen state of the diseased skin, a raggedness of surface, arising from irregular exfoliation of the epidermis, and a cracked and bleeding state of the deeper grooves of flexion of the fingers. The cuticle had been repeatedly thrown off from the inflamed surface, and the centre of the palm was smooth, of a vivid pink color, and covered by a thin coating of newly formed and smooth epidermis. On other parts of the surface of the hand, the newly formed cuticle was in a state of exfoliation. The inflamed skin of the penis had resulted from the extension of two patches of annulate tubercle, the borders of which formed the boundary of the disease. The border was several lines in breadth, and covered by a broken layer of desquamating epidermis; while the area of the patches was red, furfuraceous, and exhibited a tendency to crack in the direction of the lines of motion of the skin.

Erythema palmare syphiliticum is a syphiloderma of the second period, namely, that of tertiary syphilis, and is among the latest of the evidences of the presence of the syphilitic poison in the blood. In five cases, in which I noted the period intervening between the primary disease and the affection of the skin of the palms of the hands, I found the time to be respectively, four, eight, nine, and ten years; and, as an illustration of the persistence of the disease in this region, the same five cases gave, as the periods of existence of the disease up to the time of the patients coming before me, nine months, three years, six, nine, and ten years.

Occasionally I have met with cases, and have one now before me, wherein the syphilitic infection is recent, dating back to a period of

[1] Portraits of Diseases of the Skin, Plate XXI., AT.

twelve months, in which simple erythema, like that which occurs in infants, is developed. In this case, a copper-colored redness spreads over the palms of the hands and palmar surface of the fingers, the integument is thickened, somewhat indurated, or stiffened, and cracked in the lines of motion; but there is no desquamation such as happens in ordinary cases of psoriasis palmaris, where the affection is of many years' duration. These cases yield to the iodide of potash, which the psoriasis palmaris does not.

Erythema plantare syphiliticum, vel *psoriasis plantaris syphilitica*, is identical in its mode of origin and growth with erythema palmare syphiliticum; a good example of this eruption will be found among the *Portraits of Diseases of the Skin*, Plate XXII., A V.

LUPUS ERYTHEMATOSUS is met with as an erythematous syphiloderma in old standing cases of tertiary syphilis, and in conjunction with other forms of syphiloderma, both tubercular and ulcerative, thus placing its connection with the second period of syphilodermata beyond question. It is also met with, presenting exactly the same characters, where none but hereditary, or the remains of infantile syphilis can be present, hence I have termed it *syphiloderma erythematosum hæreditarium*. Thirdly, it occurs occasionally under circumstances of, and with appearances involving, so much obscurity, that I have thought it necessary, for the present, to transfer its consideration to the group whose name it bears, namely, lupus. At a future time, I hope to be able to unravel more completely the entanglement which envelops this very peculiar and very troublesome and obstinate disease.

SYPHILODERMA TUBERCULOSUM.

Second Period.

TUBERCULA MUCOSA.

When syphilitic tubercles occur on parts of the body where there is naturally an increased degree of moisture, or where they are kept in a softened condition by morbid secretions, they are apt to assume a state of chronic growth. Such tuberculous growths are termed soft or mucous tubercles, or condylomata. Their common situation is the perinæum, particularly in the female, where their growth is favored by the secretions of the vulva. They are also found occasionally between the greater labium and the thigh; on the scrotum, between the scrotum and the thigh; around the anus, in the groins, in the axillæ, and upon the lips. These tubercles belong to the period of tertiary syphilis, and are the common consequence of the modified syphilitic poison; appertaining in that case to the new group which I propose to make, under the name of syphilodermata mitigata. Mucous tubercles are far from uncommon on the inside of the labia majora, and in the neighborhood of the vulva of married women, where they exist for years without attracting any attention. In their ordinary state they are very little raised above

the level of the surrounding integument, but occasionally they enlarge and are troublesome; and sometimes become the seat of superficial ulceration.

TUBERCULA ULCERANTIA.

Ulceration of tubercles may be either superficial or deep; and in either state it may be stationary or progressive. Ulceration is one of the phenomena of syphiloderma which serves especially to indicate the long period of existence of the poison, and is strongly diagnostic of the *second period*, or that which corresponds with tertiary syphilis. When the ulceration is stationary, it commences on the summit of the tubercle, and extending its circumference by degrees, it delves into the substance of the skin more or less deeply. When, however, it is progressive, it creeps on by the circumference, and acquires the name of *serpiginous*, sometimes creeping over the surface to a considerable extent. At other times the creeping and the delving action are combined, and the horseshoe ulcer is the result.

The *deeply ulcerated tubercles* are more common than the superficial, and their common seat is the head and face; but they are also met with on other parts of the body, as on the back and loins, the limbs, and the scrotum. The ulcers are more or less deep and hollow, they secrete an ichorous or semi-purulent fluid, and are excavated in the midst of a thickened, red and congested skin. Sometimes they occupy a patch of tubercula circumscripta, and are so numerous as to give a worm-eaten or honeycomb appearance to the surface of the patch. Sometimes a solitary tubercle is the seat of ulceration, and sometimes the annulate form of tubercle is attacked by the ulcerative process.

Syphilitic ulceration has frequently a progressive and centrifugal action, and in most instances one side of the tubercle will be found more deeply ulcerated than the rest; or the ulcer will be observed to increase by one side while the process of healing is slowly taking place on the other; this is the so-called "*horseshoe ulcer*," a term which indicates its appearance sufficiently clearly. In the horseshoe ulcer, the integument is much congested and thickened on the side of the ulceration, while on the opposite side it is uniform with the level of the surrounding skin.

The centrifugal action of the ulcerative process is, perhaps, most remarkably shown in the superficial ulceration which sometimes attacks the annulate tubercle; and the process is so rapid as to have obtained a designation of *serpiginous*. I once saw a man, partially bald, whose head was covered with these serpiginous wheals; they were coated with a thin, squamous scab, and curved around his temples like a pair of ram's horns. In another case the circles formed a necklace, descending for a short distance upon the breast and back. This latter case is illustrated in my *Portraits of Diseases of the Skin*, Plate XXIII., A Q., under the name of *psoriasis gyrata syphilitica;* more properly, it is a syphiloderma annulatum ulcerans, or it may be termed, tubercula annulata syphilitica, ulcerantia, or tubercula ulcerantia serpiginosa syphilitica; it is the syphilide pustuleuse serpigineuse of Alibert.

LUPUS ULCEROSUS.

As tertiary syphilis becomes settled in the skin, it is remarkable how exactly it acquires the resemblance, and assumes the character of lupus, until at last it becomes difficult, and sometimes impossible, to distinguish between them; and a kind of lupus is generated, which is recognized as being the result of the syphilitic poison in its tertiary state. Such, in fact, is *lupus ulcerosus syphiliticus*.

In lupus ulcerosus there may exist one or several tubercles grouped together; the affected skin is thickened, hard, of a purplish red hue, and upon one or more of the tubercles a thin black crust is formed. If the crust be removed, a deep excavated pit, filled with unhealthy pus, and discharging a sanious fluid, is seen beneath it. The ulcerative action is very slow and gradual, lasting for months without change. At other times the ulcerative action is more rapid; several of the pits communicate, and a large unhealthy ulcer is formed, which destroys the part upon which it is situated, and is followed, on getting well, by an indelible cicatrix, with puckering and contraction of the surrounding skin. When the ulcer is situated on the nose, a portion of that organ is destroyed, and much deformity results; and equal mischief, although unaccompanied by the like deformity, may occur upon any part of the body.

When a cluster of tubercles are assembled together, forming a patch of diseased and disorganized skin, and the surface is perforated by several deep ulcerated pits, the affection was termed *lupiform syphilis*, a name which is very characteristic.

TUMORES GUMMATI.

The modification of syphilis by time is one of the most curious of its phenomena, and, at the same time, one which enables us, by tracing its mutations, to recognize it in a form so very different from its original shape, that nothing but a process of inductive reasoning could determine its identity. In a gentleman who had given evidence of the presence of the syphilitic poison in his blood for upwards of twenty-five years, there are now developed, since the completion of this period, several round tumors (tubercula gummata) in and beneath the skin, which evidently originated in the same cause. The tumors are about the size of marbles, three or four in number, and hard and somewhat elastic to the touch. They are situated in the left forearm, two or three being to all appearance in the cellular tissue under the skin, and one in the skin itself. The latter is slightly red and tender, and looks as if it would pass into a state of ulceration.

The peculiarity of these tumors is, the great distance of time which intervenes between their occurrence and the reception of the poison. And, in this particular, they seem to deserve a place by themselves under the title of "chronic syphilis;" or, if it be preferred, tertiary syphilis. In their hardness they remind us of cancer, and are very likely to be mistaken for malignant disease. When they ulcerate, that process takes place very slowly, and generally on one side, while

by the other they continue to grow; hence the ulcer has more or less of a horseshoe form, and the tissues over which it has passed, heal, but leave an indelible cicatrix. The ulcer is slowly destructive, and exhibits no tendency to granulate; sometimes it dissects out certain tissues with great neatness. The situation in which I have seen these ulcers in a state of progress, is the integument immediately in front of the ear; the following is an example: A gentleman, aged fifty, has an ulcerated sore immediately in front of the tragus of the left ear. It has occupied its present position three or four years, but latterly has been enlarging. It is now about the size of a half-crown piece. On the side next the temple it is bounded by an elevated mound of thickened skin, into the base of which the ulcer seems to burrow. The ulceration has dissected out two ligamentous bands in front of the tragus, and has isolated them completely. It is devoid of granulations, gives rise to no pain, and secretes no pus. The surface exudes a small quantity of a transparent and colorless ichor, which, left to itself, dries up into a thin scab.

Another gentleman, between fifty and sixty, has a tumor of this kind excavated at its base by a deep ulceration, the latter being covered with a slough. He has suffered from the disease sixteen years; and although existing for so long a time, the ulcer now is scarcely larger than a shilling. It is of the horseshoe form, and has burrowed into the base of the hypertrophied skin constituting the tumor. The ulcer is situated immediately in front of the tragus. The skin of the temple in front of the ulcer, and, indeed, as far as the angle of the eye, presents the appearance of a cicatrix, and along its border is an impetiginous eruption, which has crept over, and is the cause of the cicatrized skin. In this portion of the skin, and particularly in the neighborhood of the ulcer, are a number of enlarged venules.

SYPHILODERMA ULCERANS.

Syphilitic ulcers sometimes take on a more extensive character than that already described; the ulcers are large, unhealthy-looking, and frequently phagedænic, their edges are angry and excavated, and the skin around, red and indurated; sometimes their surface is dry, sometimes it pours forth an acrid ichorous discharge, and sometimes they are filled with a transparent reddish jelly-like secretion. These large ulcers are most frequently met with on the face, but they are also seen occasionally on other parts of the body. In one case I found a large phagedænic sore on the calf of the right leg; a smaller sloughing sore near the tendo Achillis, and several cicatrices, each as large as a half-crown. On the left leg, near the ankle, was another unhealthy-looking sore, of considerable magnitude. The skin surrounding the sores was of a deep-red color, indurated, and apparently infiltrated; the edges of the phagedænic sore were dry, black, and excavated perpendicularly, and the floor was covered with a gray magma. There was no trace of pus, and in the large sore no secretion of any kind.

SYPHILODERMATA HÆREDITARIA.

We have next to consider the modifications of syphilis in another point of view, namely, in its effects upon the offspring of syphilized parents, constituting *hereditary syphilis*. The transmission of the poison, in this instance, is indirect, passing from the father to the mother, and from the mother to the fœtus, the mother, in this case, being a sufferer by the transit or wholly unaffected, being, in fact, the mere material of communication between the contaminated source on the one hand, and the newly-formed being on the other. In other cases, the mother may be herself the primary source of the poison, and the father quite free from inculpation, the case being then one of direct transmission. Of a similar kind is the propagation of syphilis to an infant by means of the milk of the nurse. *Infantile syphilis* is therefore not always hereditary; it is transmitted when the poison is imbibed with the milk intended for its nutrition, and is hereditary only when it is received in the womb of its parent. But the difference in the two cases is not so considerable as might at first sight be imagined; the poison is in both instances a secondary poison, modified and chastened by transmission through the blood of another.

It is not impossible in the adult to have secondary syphilis, that is, constitutional syphilis, without any primary disease; I have met with such instances. In the transmission of the secondary poison, secondary disease is more frequent; thus, the newly contaminated wife, her husband being locally sound, is probably affected from the first with secondary or constitutional syphilis, and has no local disease; or, if there be local disease, such disease is of a secondary or tertiary nature, such as morbid secretion and mucous tubercles. And, in the case of the infant, unborn or born, it is obviously the secondary disease, or constitutional syphilis, which is transmitted. But we have now to consider the after-effects of the poison on the infant, those effects which correspond with the tertiary syphilis of the adult. It would be contrary to all analogy to suppose that infantile syphilis ceased with its first outbreak; that it was eliminated from the constitution by the remedies employed for its cure; no, it lingers in the blood; like syphilis acquired by the adult, it has its secondary and its tertiary characters; and it makes its appearance in after-life under a variety of forms, sometimes as a lupus, and sometimes a lepra. The direct connection between certain forms of lupus and syphilis cannot be doubted by the practical observer; and the relation between syphilis and lepra has appeared to me, in some cases, to be equally clear.

Hereditary syphilodermata present themselves to our notice in three forms, which serve to represent the three periods of the poison. The *first period*, represented by erythema, corresponds with the secondary syphilis of the adult; the *second period* is tubercular, and brings to our notice tubercles in different forms, and lupus non exedens and exedens, which correspond with the tertiary form of direct syphilis; while the *third period* belongs to a stage later than tertiary syphilis, a kind of quaternary gradation, and offers for our consideration another tuber-

cular affection of a more permanent kind than most of the preceding, namely, lepra.

SYPHILODERMA HÆREDITARIUM ERYTHEMATOSUM.

ERYTHEMA SYPHILITICUM INFANTILE.

Syn. *Syphiloderma erythematosum marginatum. Lepra syphilitica infantilis. Psoriasis syphilitica infantilis.*

The more common form of manifestation of constitutional syphilis in infants is erythema of the hands and feet, with epidermal exfoliation; small circular and slightly elevated tubercles, with depressed centres (cupped tubercles), looking like lepra in process of peripheral extension, and without scales; erythematous patches, of various extent and figure, also slightly raised above the surface; and excoriations and fissures around the apertures of the body, the seeming consequence of acrid humors. Then the disordered state of the mucous membrane is manifested by acrid discharges from the eyes, nose, mouth, and often ears; moist excoriations at the angles of each of those apertures; aphthæ and congestion of the mucous membrane of the mouth and fauces; a clogged state of the air-passages; tumefaction of the membrane of the trachea and larynx; and, not unfrequently, diarrhœa.

Sometimes the exfoliation of the epidermis of the hands and feet takes place at birth, the process having commenced in the womb of the mother; at other times the first symptoms of syphilis are not apparent for three weeks, six weeks, and even later. In an instance of exfoliation at the time of birth, the child, although arrived at the full term, was small, thin, and shrivelled, and the blood oozed out copiously from the denuded surface of the hands and feet; the blood was more diffluent than natural, and resisted all means to arrest it, and the child died in the course of a few days. The appearance of the feet and hands suggested to the accoucheur who attended the mother, a total absence of the skin.

The first symptoms of the syphilitic affection were evinced in an infant of five weeks, otherwise plump and well-looking, by the development of what seemed to be a common but severe cold. Its mouth and lips became dry and parched; it had cough; and its throat and air-passages seemed clogged with a thick, viscid mucus. It was nearly in this state at the sixth week. When I saw it, the mucous membrane of the mouth, as far as could be seen, was congested, and spotted with the white films of aphthæ, the voice was hoarse and husky, and the lips and angles of the mouth cracked and excoriated. There was a viscous secretion from the nose; the child was emaciated; and its skin dry. An inflamed state (erythema) of the feet was apparent at birth, and was followed soon after by a similar state of the hands; the cuticle was thrown off in large flakes and by repeated exfoliations, leaving the skin beneath very tender, and giving rise to cracks, of various extent, in the direction of the joints. Some of the cracks extended quite around the fingers, were of considerable depth, and bled a good deal.

In another child, three months old, there appeared an extensive erythema covering a considerable part of the surface of the body. The eruption was of a dull-red hue, slightly raised above the level of the surrounding skin, smooth as though tumid, lustrous like metal, exfoliating in some situations, and distinctly circumscribed, the border being slightly raised, and paler than the rest of the patch, reminding us of the wheals of urticaria. On the nates and thighs were several circular spots about as large as a sixpenny-piece, very slightly raised, particularly at the border, and depressed, or cupped, in the centre.

On the face the erythema was chiefly situated around the eyes, nose, and mouth, and on the cheeks, in the course of the tears. The eyelids were inflamed and swollen, the eyes moist, and there were excoriations at their outer angles. There were also excoriations around the apertures of the nose, and at the commissures of the mouth. The nose was filled with mucous secretion, and the nasal respiration snuffling; the cry was hoarse. On the limbs the eruption occupied chiefly the outer sider of the arms and legs.[1]

In a more advanced stage of the disease, the erythema having subsided on the feet and hands, had left behind it an exfoliation of the epidermis; the head was covered with dandruff and scurf, while on the nates there were numerous tubercular spots of a circular figure, about the size of a sixpence, with raised margin and depressed or cupped centre, of a dull-red color, and bearing a close resemblance to the spots of lepra divested of their scales. The child was thin and weakly, its skin muddy and rough, the conjunctivæ congested, and the eyes weeping; there was a copious discharge from the nose, a thick, mucous secretion clogging the mouth and fauces, a viscous phlegm in the trachea, which impeded breathing, and a hoarse cry, which indicated swelling of the mucous membrane of the larynx; the child was, besides, very uneasy and fractious; had been suffering from a somewhat severe diarrhœa, and was still relaxed in its bowels; at the angles of the eyes, nose, and mouth, the mucous membrane and skin were excoriated, and poured out an acrid secretion; and there were similar excoriations on the lips, which had produced a tender state of the nipples of the mother.

SYPHILODERMA HÆREDITARIUM TUBERCULOSUM.

LUPUS SYPHILITICUS VEL TUBERCULA LUPOIDEA.

The commonly recognized source of lupus is scrofula; and then we may ask, What is scrofula? Now, scrofula, if not in all cases, certainly in some, takes its origin in syphilis. Therefore, lupus, or scrofulous lupus, may be considered as an appendage of syphilis, more or less direct. But it is not my intention to discuss an opinion which I put forth several years back, that scrofula was the offspring of syphilis, nor to interfere with those examples of undoubted lupus which I have already considered in a previous chapter; but simply to investigate

[1] A good example of this eruption will be found among the Portraits of Diseases of the Skin, Plate XVIII., A W.

certain obscure forms of cutaneous disease which occupy the neutral ground between syphilis and lupus, which must be classed with lupus, if lupus be syphilis; but, if such be not the case, must, for the time being, be considered as *lupoid*, and constitute a group of transition between syphilis, from which they clearly proceed, and lupus, with which they appear to be analogous.

These lupoid affections originate in the syphilitic poison conveyed to the infant, either during its intra-uterine existence, or soon after birth; and they bear the same relation to the syphilitic poison, then introduced, that tertiary syphilis bears to secondary syphilis proceeding from the primary poison. In a word, they may be regarded as syphilodermata of the *second period*, or as examples of tertiary cutaneous eruption.

They are doubtless modified by a variety of conditions, and to this circumstance may be attributed the great diversity which they exhibit in respect of severity, and their nearer approach to, or farther removal in appearance from, syphilis. Thus, we should expect a different character of eruption in a poison obtained from the mother, than from one derived from a nurse; and the difference of period or severity would modify it in both of these sources. Again, the modifications might spring from the child itself; its powers of nutrition, its degree of vital energy, its diseases, particularly those of an eruptive kind; its age, for sometimes these affections appear in youth, and at other times may not be developed until manhood or womanhood.

But, whatever the cause or degree of modification, the lupoid disease may be classed, according to its pathological characters, into *simple* or *non ulcerating tubercles; ulcerating tubercles*, the ulcers being *superficial* or *deep;* and *serpiginous tubercles.*

Of the *simple* or *non-ulcerating lupoid tubercles*, the following is an example: A young lady, aged nineteen, had an incomplete ring of tubercles situated on the cheek, near the lower eyelid. The line of tubercles curved upwards towards the temple, where they were met by a wheal-like tubercle, nearly an inch in length. The color of the elevations was a dusky red, approaching to purple; they were perfectly smooth on the surface, and had occupied their present position for nearly two years. She had been treated with lotions and ointments of all kinds, and nitric acid had been proposed to her. The fear of a scar resulting from the use of the caustic, and the recent appearance of a similar tubercle on the nose, was the occasion of her visit to me. She had no other spot of any kind about her. I treated her with the bichloride of mercury and sarsaparilla, and she gradually lost all trace of the eruption. It was not one of those cases of disorganization of the skin which I have described in connection with syphilitic tubercles, and therefore there was no cicatrix, not even a stain, left behind.

Of the *ulcerating lupoid tubercles*, the following may be taken as an example: A young gentleman, under twelve years of age, was brought to me with a cluster of lupoid tubercles on the scalp; some of the tubercles were in a state of ulceration, and several large cicatrices showed where other ulcers had healed. He was an unhealthy-looking boy, of short stature for his age, had large tonsils, and a tumid abdomen.

His mother informed me that he had suffered from eruptions of the same nature as that upon the scalp, ever since his birth. The age of this boy precluded the possibility of his having been in the way of the syphilitic poison; and yet no one who had ever seen a syphilitic tubercular eruption would have doubted for an instant as to the nature of the one under which he was suffering. I have seen several cases of a similar kind, which have been brought to me under the idea of their being an obstinate form of ringworm. A young lady and her brother, the children of a college friend, not remarkable for his steadiness as a student, are now under my care for this disease, and are progressing rapidly under the use of the iodide of potassium.

SERPIGINOUS LUPOID TUBERCLES.—A common form of the lupoid eruption is a roundish patch of a dull-red or purplish-red color, slightly raised above the level of the surrounding skin, indolent, sometimes spreading by the circumference, so as to form a ring and healing imperfectly in the centre; sometimes spreading on one side only, and healing on the rest; sometimes ulcerating deeply, in one or several points, in the latter case producing a worm-eaten appearance of the skin; sometimes ulcerating only superficially, and forming a dark, irregular crust. The secretion of these patches is an unhealthy pus, or a mere watery ichor. This form of eruption is very commonly met with on the limbs and on the backs of the hands and feet; it exhibits a tendency to a peripheral situation; hence it may be developed also on the nose or on the ears. On the limbs and hands it would be recognized as a scrofulous eruption; on the nose or ears, it would be called lupus. In a lad at present under my care, the patch of morbid skin occupies the dorsum of the thumb, and is perforated by several small openings, which exude a healthy-looking pus. In a young man of eighteen, it affects the dorsum of the feet; by peripheric growth, the disease has been carried forward upon the toes, and outwards to the border of the foot, the central part having healed and left a permanent cicatrix. The greater part of the ring has also healed, so that what remains is only a portion of the original disease.

A gentleman, aged twenty-seven, has several patches of this kind on his right arm, the worst being on the dorsum of the hand. He has been several years under my care, paying me a visit from time to time. When he first came to me, there were numerous holes in the skin, which was thickened and undermined, and the disease occupied the middle of the back of the hand. Now, the part originally affected has healed, the disease has advanced upon the knuckles; there is no longer any deep ulceration, but the tubercular ridge which remains is covered by a thick, dry crust, which brings into view an abraded surface when raised. The disease began as a tubercular blotch of small size on the skin covering the carpo-metacarpal joint of the thumb. In his boyhood, he suffered for a long time from chronic ophthalmia; a younger brother is affected with enlargement of the lymphatic glands of the neck, but the rest of his brothers and sisters, older than himself, and five or six in number, are perfectly healthy, as are his parents.

A young lady, twenty years of age, was brought to me, in the year 1851, with an eruption on the dorsum of the right foot which had

troubled her since infancy. She was a person of lymphatic temperament, but otherwise enjoyed good health, and she had no other disorder of the skin of any kind. The present eruption appeared on her foot as a patch of redness, when she was two months old, and continued in an indolent state; at four years, an abscess formed on the spot, and was succeeded by ulceration, which spread by degrees over the dorsum of the foot, towards its outer border and the toes. The ulceration continued until within the last few months, but has now healed. As it moved onwards upon the skin, the parts behind healed, and formed a large and permanent cicatrix.

At the present time, the skin along the roots of the toes is thickened and uneven, of a purplish-red color, soft to the touch, fissured here and there by deep grooves, and in some parts incrusted with small adherent scabs. There is no ulceration, but when the scabs peel off, a little moisture oozes from the skin. The entire surface is red, and in a state of epidermal exfoliation. On the border of the foot, the erythema and epidermal exfoliation cease abruptly, and the broken and irregular edge of the thick cuticle of the sole of the foot forms the boundary of the disease.

The cure of these serpiginous ulcerations affords a good example of an unhealthy healing process; large red granulations are thrown up, which frequently become covered with epidermis, and produce a papillated and uneven surface; and irregular patches of granulations, sheathed with epidermis, are interspersed with small ulcerated hollows, which extend more or less deeply into the structure of the skin. In some instances, these granulations appear to be formed independently of ulceration, and a large, raw, granulating or granulated surface is presented to view. These granulations bleed very easily, and are so soft as to be frequently torn away in the removal of the dressings. When, by peripheric growth, the ulcerative action has reached the toes, and extended into the clefts between them, a curious phenomenon occurs. The opposite surfaces of the toes being raw and granulated, and the granulations lying for some time in contact, become adherent, and the toes are united with each other to a greater or less degree. In a lady at present under my care, all the toes of the right foot are so closely united together, that no vestige of them, as separate organs, exists; they form a single mass, and give the end of the foot the appearance of an amputated stump.

There is another form of *lupoid tubercle*, which is commonly solitary, and is met with on the tip, or upon the alæ of the nose, and chiefly in women. It is generally recognized as a form of lupus attended with hypertrophy, and differs from lupus exedens, with which alone it can be confounded, in the absence of the destructive activity of the latter. A lady, aged sixty, has suffered from this disease more than four years; it began with a feeling of dryness of the mucous membrane within the nose. A small pimple, which formed a scab on its summit, then appeared upon the ala nasi; it gave rise to no pain, but, from its inconvenient position, was frequently picked with the finger-nail. It has never exceeded a quarter of an inch in diameter, and appeared to be composed of a mass of imperfectly-formed granulations. Latterly,

it seemed to shift its situation, as though it were enlarging on one side, and shrinking on the other; and on examining the part which it had left, it was found that it had imperceptibly eaten through the border of the nostril.

The term, *hypertrophous*, must therefore be taken to refer only to the general appearance of these singular growths; they are destructive as well as hypertrophous, although to an infinitely less degree than the form of lupus which has been distinguished by the name of "exedens." As I have already observed, with regard to syphilitic tubercles, the hypertrophy of this form of lupus seems to result from the conversion of the normal structure of the skin into its own substance, a material of an inferior type of organization, which may be aptly compared to a vegetable fungus; and it follows, that, as soon as an absorbing action is set up, either accidentally or by the aid of medicine, the fungous tissue vanishes, and a deep hole is left in its place. Hence the disappearance of these growths is always followed by a cicatrix, and, as I have observed in the case of the lady just referred to, by a permanent loss of structure.

This form of lupus offers some variety in point of color, a variety which seems to depend more upon the state of health or age of the patient than upon anything special in the morbid structure itself; and partly, perhaps, also on its situation. In a peripheral region, like the end of the nose, the circulation is less active than in more central situations, diseases occurring upon it are liable to congestion, and the gradual conversion of arterial into venous blood gives them a purplish bloom, or a duskiness or lividity of hue.

LEPRA, considered as a syphiloderma, belongs to a later period than the preceding forms; it is not developed, like them, in the individual who receives the poison, but in a succeeding generation, sometimes in the immediate successor of the syphilized person, and sometimes more remotely. In support of these views, I quote the following case, and am content to leave the subject to the reflection of the student. All that belongs to the proper history of lepra will be found in a previous chapter. The case to which I allude is briefly this: A man had infantile syphilis when a child; he married, and had eight children, two of whom died as infants; of the six surviving children, three are the subjects of lepra vulgaris.[1]

TREATMENT.—In the treatment of syphilodermata, we must, in the first instance, subdue the feverish symptoms which accompany the eruption, in other words, the syphilitic fever; we must remove the poison from the blood by every means in our power; and thirdly, we must support the powers of the system, to give it greater energy to eliminate the poison, and also to resist its lowering tendency. To remove the poison we have recourse to remedies which are calculated to act on the natural emunctories of the system, the bowels, liver,

[1] "On Syphilis, constitutional and hereditary, and on Syphilitic Eruptions," by Erasmus Wilson, F.R.S., 1852, page 167.

kidneys, and skin; and our means of support must be derived from the catalogue of tonic remedies, amongst which the most useful is iron.

It rarely happens that the syphilitic fever rises so high as to require the abstraction of blood; but such cases sometimes occur, and if the patient be full and strong, no inconvenience can arise from the practice. Local congestions are relieved by the bleeding; the nervous system oppressed by the weight of the poison is lightened; and the blood which remains is impressed with a different action to that of generating a morbid ferment; namely, one of repairing its own loss. On the other hand, it must be borne in mind, that upon the general powers of the system will fall the labor of eliminating the poison, and resisting its morbid effects; hence the constitution must not be lowered, and particularly so in cities and large towns. Indeed, the power which we possess of relieving the blood through the natural emunctories is so great, that venesection is only likely to be required in very severe cases of local congestion, as of the brain or lungs; and, even in such cases, the quantity requiring to be removed is very small. The general inflammatory excitement attendant on an outburst of the syphilitic fever is therefore to be combated by an active purge, by diuretics, and by diaphoretics. A dose of calomel and colocynth, followed by a draught of senna and Epsom salts, will effect the first of these objects; and tartarized antimony, with abundance of diluent drinks, the rest. Opium is also a necessary element of the treatment, its purpose being to calm irritability and restlessness; with this object, and for the purpose of aiding the action of the mucous membranes and skin, ten grains of Dover's powder, at bedtime, will be found of much service.

As soon as the inflammatory excitement is allayed, it is time to begin the mercurial treatment. I am not aware that any particular form of mercurial preparation is superior to another for this purpose. I select usually the protioduret, which I prescribe in doses of a third of a grain, in combination with extract of lettuce, or conium, three times a day. This medicine agrees with the stomach usually very well; but if it produce nausea or uneasiness, then I either exhibit the pills less frequently, or have recourse to some other form of mercurial preparation. Where the alimentary canal evinces a decided repugnance to the presence of mercury, we may obtain its effects by means of inunction. For this purpose a drachm of the strong mercurial ointment should be gently rubbed into the inner side of the thigh and leg every night at bedtime, changing the leg each night to avoid too much irritation of the skin. In a case where it was of consequence that the inunction should not attract the attention of the patient's family, I limited the frictions to the soles and inner sides of the feet with perfect success. Indeed, the inunction may be made on any part of the body that shall be most convenient to the patient.

In pursuing the mercurial treatment, it is of the utmost importance to pay attention to hygienic conditions and diet. Stimulants of all kinds, either in food or drink, are to be carefully avoided, as is also exposure to cold and fatigue. And the intention of the treatment should never be lost sight of, namely, to increase the natural functions

of the depurating or emunctory organs, the bowels, the liver, the kidneys, and the skin. The action of the mercury, and especially the functions of the kidneys and skin, are very much aided by the use of the compound decoction of sarsaparilla; the compound decoction of guaiacum; the decoction of saponaria; or the infusion of elder-flowers. I have no belief in the specific powers of sarsaparilla; but I cannot conceive a remedy better suited for the purpose of soothing the alimentary canal, and at the same time of acting on the depurating organs, than the compound decoction of that root. For this purpose it must be taken largely; a pint and a half or a quart in the course of the day.

We now have the plan of treatment of syphilodermata of the *first period*, or those which depend on secondary syphilis, before us, namely, the careful avoidance of all stimulants, either mental or physical; the patient to keep his bed or his room; and to defend himself particularly from the risk of being chilled. Medicinally; if the inflammatory symptoms run high, and the powers of the system be equal to the loss, abstraction of a few ounces of blood; leeches or mustard cataplasms for local congestions; a calomel and colocynth purge, followed by a black draught, together with liquor ammoniæ citratis and tartarized antimony; or effervescent salines, with antimony; and a Dover's powder at bedtime, until the inflammatory stage is subdued. Thirdly, mercury in small doses, with the compound decoction of sarsaparilla; attention to the bowels, and an opiate, if necessary, at bedtime.

Besides this, which may be regarded as embracing the more essential points in the treatment of constitutional syphilis, there are several appliances which may be added to the general treatment, or be made to occupy a prominent position, according to the views of the surgeon or the convenience of the patient; for example, the warm bath, and vapor bath. The former of these is soothing and agreeable, and may be used daily, or even twice a day. The latter might also be used daily; it is a powerful and important remedy, and establishes an active drain, which doubtless carries off a large share of the syphilitic poison in its stream. The vapor bath, of late years, has acquired additional importance, from its having been made the chief agent of treatment of constitutional syphilis by Langston Parker. Mr. Parker raises the vapor of the bath by means of a lamp, and he also introduces beneath the cloak which surrounds the patient an oxide of mercury, furnished with a separate lamp, for the purpose of vaporizing it; hence, he observes, the patient is "exposed to the influence of three agents, heated air, common steam, and the vapor of mercury." Here, it will be seen, the treatment is made to turn upon the general emunctory property of mercury, and the special emunctory action of the skin.

In Germany, in addition to several curative processes founded on the limitation of supply, one method of treatment, which may be briefly defined as a triple compound of starving, purging, and sweating, enjoys especial favor. I mean the treatment by Zittman's decoction. This treatment is as follows: On the first day the patient takes

a full dose of calomel and the resinous extract of jalap. During the next four days he drinks daily two quarts of Zittman's decoction; one quart of the *strong* decoction, taken warm in the morning, and one quart of the *weak*, cold, at mid-day. On the sixth day he repeats his calomel-and-jalap pills; and during the four succeeding days continues the decoction as before. On the eleventh day, if the patient be strong, he takes another dose of the purgative pills; if not, this is dispensed with. During the treatment the patient's diet is carefully regulated; on the days when he takes the purgative medicine he has three meals of broth; on the decoction days he is allowed two ounces of roast meat and two ounces of bread. He keeps his bed during the entire treatment, and at its conclusion is not permitted to quit his room for some time longer, maintaining a low diet, and drinking the decoction of the woods. If the patient be suffering under syphilitic ulcers, these are dressed, simply, with lint soaked in water; and if he be weakly, he takes of Zittman's decoction only one bottle a day, instead of two, with a view to prolong the treatment. If he be not cured at the conclusion of the treatment, it is to be repeated a second time, or until he is well. This treatment has the sanction of a sound and practical surgeon, whose practice I had the advantage of following for some time—Chelius, of Heidelberg.

The decoction keeps up a constant state of perspiration from the skin, increases the quantity of urine, and produces five or six watery evacuations in the course of the day. Its mode of preparation is as follows:

Decoctum fortior.

℞.—Sarsaparilla radicis concisæ, ℥iv.
Aquæ fontanæ, Oxxiv.
Coque per quartam horæ partem, et adde
Aluminis,
Sacchari albi, āā ℥vj.
Hydrargyri chloridi, ℥iv.
Antimonii oxysulphureti, ℥j,
in nodulo ligato.
Sub fine coctionis admisce,
Sennæ foliorum, ℥iij.
Glycyrrhizæ radicis, ℥iss.
Anisi seminum,
Fœniculi seminum, āā ℥ss.
Decoque ad octaria xvj,
et cola.

Decoctum tenue.

℞.—Decocti fortioris residui.
Sarsaparillæ radicis, ℥vj.
Aquæ fontanæ, Oxxiv.
Coque, et sub fine coctionis adde
Pulveris corticis citronum.
Pulveris cinnamomi,
Pulveris cardamomum, āā ℥iij.
Glycyrrhizæ radicis, ℥vj.
Decoque ad octaria xvj, et cola.

After the symptoms of constitutional syphilis have fairly subsided under the influence of the mercurial treatment, nitric acid may be exhibited for two or three weeks longer, to give tone to the mucous membrane, and remove any remains of the poison which may still linger in the blood or in the tissues. The dose of the dilute nitric acid is twenty drops twice or three times a day, in sweetened barley-water; or it may be combined with the fluid extract of sarsaparilla, as a vehicle; or, should there be any appearance of anæmia, we must restore the healthy condition of the blood by means of ferruginous remedies.

We may now suppose the first attack of constitutional fever, or secondary symptoms, to have passed away; but it does not therefore

follow that the syphilitic poison is entirely banished from the blood; on the contrary, the probability is, that after the lapse of a few months a second attack will occur, and after that we may have a third, a fourth, and even more; the attacks at last becoming irregular, and putting on a new shape and new characters. We have, therefore, to consider what modification of treatment may be most suitable for these successive attacks; what change of remedies the chronic character of the syphilitic disease may require.

It is a curious fact, that as the attacks of constitutional syphilis become further removed from the original contagion, that is, as the poison becomes more and more assimilated, mercury seems to lose its influence, and other remedies acquire the control of the poison which it previously possessed. That may not be the case with regard to the second, or even the third, outbreak of the syphilitic fever; the time varies in different constitutions; but we must be prepared for the manifestation of the peculiarity sooner or later. In the second attack of constitutional disease, the protioduret of mercury will possibly be found to retain all its power; in the third, the bichloride may be more efficient; in the fourth and successive attacks, the iodide of potassium. It is difficult to explain this peculiarity otherwise than by supposing that the tissues lose their susceptibility of being excited by the mercury after a number of repetitions.

In syphilodermata of the *second period*, those forms which belong to the "tertiary syphilis" of Ricord, mercury is not only inadequate to the removal and cure of the disease, but is actually injurious, inducing irritability of system, producing new and more violent attacks of eruption, and forcing a simple tubercular eruption into a state of refractory ulceration. It is at this period that iodide of potassium takes the lead as an anti-syphilitic remedy, and its use is attended with the most satisfactory results. Sometimes it effects a cure in a short period; at others it seems to flag in its effects, and requires to be increased in dose; and it may be beneficially assisted by bitters, or in case of an anæmic state of the constitution, by the preparations of iron. I have before remarked that a useful and effective dose of the iodide of potassium in the beginning of treatment is three grains; this we may increase, if need be, to five, eight, or ten grains, or even more, three times in the day; and, indeed, without such increase, we are liable, in cases rendered unusually rebellious by mal-treatment, and especially by the abuse of mercury, to fail altogether, and attribute to the remedy what is properly due to our own mismanagement. The iodide of potassium is the remedy best suited to those chronic forms of tuberculous eruption which I have distinguished as tubercula circumscripta, and it is especially indicated in the ulcerating tubercles, and those deeply-seated disorganizations of the skin and subcutaneous tissues which have received the name of "gummata."

I have already observed that in those chronic syphilodermata where mercury ceases to exert a beneficial influence; where mercury is not merely negative in its effects, but obviously and plainly excites an irritable and destructive action both on the system at large and upon the local disease; our great remedial agent is iodide of potassium,

and this medicine frequently acts as a charm in such instances. I have in my mind at this moment the case of a gentleman, who one morning staggered feebly into my consulting-room, accompanied by his physician, and ordinary medical attendant. He introduced himself as a lost and hopeless man; and he certainly presented a vivid picture of exhaustion and decay. He showed me several large, deep, and foul ulcers upon his legs, and he said that the surgeons of eminence whom he had consulted, even a few days before his visit to me, would insist upon his taking mercury, which he knew was destroying him. I prescribed for him the iodide of potassium; and in less than three months he called upon me, having just returned from the country, declaring that he had never felt stronger or better in his life. I should have been very sorry to have mentioned this case, if I thought it could, by any possibility, be used as an argument against mercury. Mercury, as I have before observed, is an invaluable medicine, but one requiring to be used with judgment; to be watched in its effects, and to be regulated according to those effects rather than upon any scheme of theoretical results; indeed, mercury, like iodide of potassium, and every other medicine, must be exactly graduated in dose, combination, and period of administration, to the special case of the patient. Each patient, as he varies in physiognomy from his foregoers, varies also in constitution, in the characters of his disease, and in his susceptibility to the influence of medicine.

The iodide of potassium seems to act, generally, upon all the tissues of the body in a remarkably short space of time, and especially on the kidneys. Its combination with the compound decoction of sarsaparilla facilitates its action, notably increasing its diuretic properties, and supplying a convenient vehicle with which the poison may be excreted by the mucous membranes and by the skin.

After it has been taken for a time, it begins to excite an overaction in the various tissues of the body; firstly, in the mucous membrane; then in the nervous system and brain; and these actions may be regarded as evincing the poisonous properties of the medicine. I have said that the symptoms now referred to are first perceived in the mucous membranes, and especially in that of the fauces, the nose, and the eyes; all that is necessary, therefore, is to watch for these symptoms, and, if it be thought desirable, as soon as they occur, the use of the remedy should be suspended, or the dose reduced. In this way we are enabled to put an immediate stop to the continuation of the morbid effects. When iodine begins to act as an irritant to the system, there is a feeling of stiffness and dryness in the throat; more or less coryza; and an uncomfortable feeling with increased secretion from the nose; sometimes tenderness of the salivary glands and salivation. By degrees the congestion extends to the trachea and bronchial tubes, adding bronchitis to the other symptoms. These indications of irritation of the mucous membrane generally precede those of disturbance of the nervous system, and give sufficient warning of a necessity for putting a stop to the use of the medicine. When the iodine has been carried further, the patients complain of dimness of sight, giddiness, and pain in the head; and in one patient,

I saw severe palpitations of the heart. But although I have used the medicine extensively, I have seen very little of its morbid effects, probably from always exhibiting it with caution.

My mode of administering the iodide of potassium, is to prescribe five grains twice or three times a day, according to the power or constitution of the patient. If I begin with five grains three times a day, I increase the dose during the second week to seven grains and a half; and to ten grains during the third week; always impressing on the patient that if any disagreeable effects are produced by the medicine he is to stop it immediately, and as soon as the disagreeable symptoms have subsided, begin it again, but in a less dose. If the cessation should continue for a week, I require that the dose for recommencement should be that first prescribed. In this way I get the full effects of the medicine rapidly, and I avoid the risk of any mischievous effects from its use. I was first led to adopt this mode of employing the iodide of potassium from meeting with cases in which the medicine had been continued for many months at the same dose, and had lost its effect on the constitution of the patient completely; and subsequent experience has led me to believe that as much and more effect may be produced, by this mode of administration, in three weeks, than can be obtained by the unvarying dose in as many months; indeed, after a time, the remedy becomes utterly useless. Sometimes I find it convenient to continue the five-grain dose for a longer period than a week, and the same with the others; I endeavor to ascertain the period during which the action of the medicine is progressive, and have the dose increased immediately that period is passed.

Syphilitic eruptions of the skin, when general, require no other *local treatment* than the occasional use of the tepid soap-bath. When situated on the face, the diluted citrine ointment, or the nitric-oxide-of-mercury ointment, applied with gentle friction, are good remedies, and tend to hasten the absorption of the pimples and tubercles, and the removal of the stains which they leave behind them.

When tubercles pass into a state of ulceration, these ointments are still of much service, as gentle stimulants; but when a more soothing remedy is required, or when we merely desire to protect the ulcer from the influence of the atmosphere, we may have recourse to the benzoated ointment of oxide of zinc, either by itself, or in combination with a few grains of camphor, or a few drops of liquor plumbi diacetatis.

For sloughing sores, an opiate lotion and water-dressing answer the purpose well, and if the ulcers be indisposed to heal, the black wash and yellow wash, either with or without opium. In these cases, and particularly in phagedænic sores, a lotion of chloride of zinc will be found to be of excellent service; a medium strength is one drachm to the half pint, but this can be increased or diminished, according to its effects, and particularly in reference to the degree of pain which it may occasion.

Of course the local treatment is quite secondary to that of the general system; but I have succeeded beyond my expectation, in several

instances, in causing the removal of local tubercular masses in a state of ulceration, by frictions with the mercurial ointment, and the application of a mercurial plaster.

It is remarkable how soon the *fall of the hair*, which accompanies syphilis, is checked by means of the remedies employed for the relief of the other symptoms; the mercurial preparations or the compounds of mercury with iodine. The plan of treatment is therefore simple and obvious. Occasionally, however, alopecia is the only evident symptom of the presence of the syphilitic poison in the blood, in which case we should hardly be warranted in subjecting our patient to a mercurial course. Under such circumstances I have found the iodide of potassium, in three-grain doses, three times a day, or five grains twice a day, answer every purpose; continuing the treatment in augmenting doses, for a medium period of six weeks, unless symptoms of iodic irritation arise.

For local application the best remedy is a pomatum, consisting of one part of the nitric-oxide of mercury ointment, to three of scented pomatum. This should be well rubbed into the roots of the hair at bedtime each night, and a proper degree of action maintained in the scalp, by means of plentiful friction with the hair-brush. As an aid to the stimulant excitation of the skin, the ammoniated hair-wash,[1] introduced among the roots of the hair by means of a sponge, may be used in the morning before brushing. This wash, besides aiding in the excitation of the skin, assists in removing the scurf which is apt to form upon the sordid skin of persons affected with constitutional syphilis, and affords great comfort to the patient; and it not only checks the fall of the hair, but causes its reproduction where it has already fallen.

The *chronic affections of the nails*, attended with dryness and imperfect formation, come into the same category with the erythematous affections of the palms of the hands and soles of the feet, and their treatment is mercurial; either the protioduret or the bichloride. It is quite remarkable how rapidly chronic erythemata of the hands and feet, attended with desiccation, cracking, and exfoliation of the cuticle, and depending on syphilis, give way to the action of either of the above preparations, in alterative doses. In three weeks the misery of years may frequently be entirely cured, after every other remedy and mode of treatment had been tried in vain. Medical men suffering from this complaint have been startled at my audacity, when I have promised them a cure, in three weeks, of that which has baffled themselves for months, and more frequently for years; but my promise has rarely failed to be accomplished.

I must mention, however, that these erythematous disorders are apt to return from time to time; but the remedy may be repeated as often as they appear, and in the end will prove triumphant. I do not believe that any good results from continuing the medicine for many days beyond the period of cure; I order it to be left off at the end of a week, after the skin is healed; and prefer, in case of any return, to resume the remedy as before.

[1] Vide, Selected Prescriptions.

For the local treatment of these erythemata, the camphor cerate is the best application, or the benzoated ointment of oxide of zinc with honey or spirit of camphor. In either case the proportion is a drachm to the ounce. An ointment containing a drachm of glycerine to the ounce of simple cerate is a good application; or a lotion containing one part of glycerine to three of camphor mixture or rose-water.

The purpose of these local remedies is simply to keep the skin moist; and great comfort is sometimes obtained by sleeping with a water-dressing on the parts; the cure is to be looked for from the internal remedies alone.

ONYCHIA and the painful granulating sores which sometimes form under and around the nails, also derive their cure form the constitutional treatment; but they at the same time require some local management. When in an inflamed state, water-dressing, with Alison's prepared lamb-skin, or a solution of opium in place of simple water; when less painful, a weak solution of chloride of zinc, or acetate of lead, are the proper remedies. Sometimes the zinc ointment, or simple cerate with camphor, or an ointment of Peruvian balsam, answer better than the lotions; and in two or three instances I have obtained the best results from covering the granulations with powder of charcoal.

MUCOUS TUBERCLE, like other forms of syphilitic tubercle, obeys the will of the internal remedies employed against the manifestation of the syphilitic poison in the skin. It would get well without any external application; but sometimes we may be required to treat it locally, when the nitrate of silver, the oxide of zinc ointment, or a lotion of chloride of zinc, or alum, or the black or yellow wash, will be found the best suited to our purpose. After drying the tubercles well, it has been recommended to powder them with calomel.

For INFANTILE SYPHILIS the treatment must consist of mercury; and the best remedies in every respect, according to my experience, are the bichloride, calomel, or hydrargyrum cum cretâ, which may be administered either to mother or child, or to both, according to the judgment of the surgeon. If the mother evince symptoms of constitutional syphilis, it may be sufficient to exhibit the mercury to her only, the infant drawing its nourishment from her breast being regarded as part of herself. If the proportion of mercury thus conveyed to the infant be deemed insufficient, there can be no objection to give it independently to the latter. And in several instances I have satisfied myself with giving it to the infant only. I have not, in this case, for an instant imagined that the mother was free from the poison, but only that her tissues were so far accustomed to its presence, that it was incapable of setting up any morbid action, at least so long as she continued to suckle, and the milk performed the office of an emunctory current; and I was quite prepared, should any retardation in the cure of the infant occur, to exhibit the remedy to the mother also. In a word, I consider the safest practice in these cases to be, to give mercury to the mother as well as to the infant; taking care to moderate the dose to such a degree as not to check or injure the secretion of milk.

I have heard it suggested that the infant may be affected with syphilis in the womb of its mother, without the latter being contaminated; and that contamination of the mother may subsequently occur in consequence of transmission of the poison from the diseased child to the tissues of the parent. Such a theory I consider to be most unphilosophical; it is easy to comprehend that, in the instance of syphilitic contagion, the child may be the seat of manifestation of the disease, just as in a male the disease may fix upon one spot or one organ of the entire body; indeed, not merely because the fœtus under such cicumstances is a part of the whole, but because it is also a part of more recent formation, a new organ, and made up of new tissues, which we may conceive to be more susceptible of receiving, and more easily influenced by, a morbid poison.

It is also perfectly consistent with physiological laws, that the fœtus having become the focus of excessive accumulation of the poison, the latter may react upon the parent with such force as to cause a manifestation of the presence of the poison in her tissues as well. The problem, therefore, resolves itself simply into one of latency and development.

The dose of the bichloride to the mother under the above circumstances should be one-sixteenth of a grain, in combination with syrup of poppies and tincture of bark, or the compound fluid extract of sarsaparilla, three times a day; and to the infant one-twenty-fourth of a grain in syrup of poppies and dill-water.

The local treatment for excoriations around the nose and mouth of the infant is the benzoated ointment of oxide of zinc, or an ointment composed of a drachm of the unguentum hydrargyri nitratis to the ounce of ceratum cetacei. The latter is especially applicable to excoriations in the neighborhood of the eyelids. For cracks upon the hands and feet, and for excoriations around the pudendum and anus, the benzoated ointment of oxide of zinc is also the proper application; and secretions in these parts may be absorbed by the oxide of zinc powder. For discharges from the meatuses of the ears, soap and water is the best remedy.

HEREDITARY SYPHILIS.—After the age of infancy, congenital syphilis gradually merges into what may be termed hereditary syphilis. The infantile syphilis gets well, but several months or years afterwards, it breaks out again. Sometimes, however, the patient has been free from any indications of syphilis in his infantile age, the first manifestations of its presence in the system being delayed to the period of advanced childhood, puberty, or even adult life. This more properly constitutes hereditary syphilis. The kind of syphilitic disease now under consideration, in its more recent forms, yields without much difficulty to the bichloride of mercury; when more advanced, the iodide of potassium is a useful auxiliary; and in a more distant remove, the combinations of iodine, mercury, and arsenic, and cod-liver oil, become valuable remedies. I have had little experience of the hydrochloride of gold; but I should apprehend that it is to the present form of syphilis that it would be especially applicable.

Some of the forms of hereditary syphilis are remarkable for their extreme obstinacy, refusing the slightest obedience to medical agents, and maintaining their course unimpeded. These cases are only to be managed by opposing obstinacy to obstinacy, by following them up with appropriate remedies, that is, with remedies directed upon a proper principle, when even the most enduring will be found to yield at last. In pursuing this course, it is evident that we must seek to obtain a gentle and continuous influence over the system, such as that by which Nature conducts her operations; we give expression to our meaning by the term, "alterative;" our process should be essentially alterative; large doses of medicine and heroic action are only calcu lated to exhaust the powers and do mischief. In making these observations, I have now in my memory several persevering "incurables," who, by a steady continuance of remedies for periods varying between one year and four, are fast approaching cure. And in another point of view, these observations are not without their value; the patient frequently tires, the surgeon despairs; in both instances, because an unwarrantable expectation has been created; but if, from the first, the difficulty be appreciated, both move onward with more comfort, and with less prospect of disappointment. The surgeon is no longer incited to make a bold effort, which cannot but end unhappily, and the patient takes no step to urge him to such an attempt by impatient suggestions.

In some instances of the lupoid tubercle, I have found the iodide of potassium a serviceable remedy; in others, the bichloride of mercury has proved most useful. Sometimes the iodide of iron has brought about a healthy condition of the general system, which has been followed by an improvement in the local disease; and, at other times, I have derived the best results from the triple solution of mercury, iodine, and arsenic, given alone, or in conjunction with cod-liver oil. When the arsenic, in the triple compound, has appeared to be objectionable, I have had recourse to the tonic properties of quinine as an adjunct to the iodide of mercury, and with a very satisfactory result. The following formula is an excellent substitute for Donovan's solution, agreeing well with the stomach, and possessing the advantage of being in a more condensed and convenient shape for deglutition:

R.—Hydrargyri biniodidi, gr. ¼.
Quinæ iodidi, gr. j.
Micæ panis, gr. j.
Mucilaginis, q. s.

In these very obstinate cases, it is important to remember, that when the remedies disagree with the patient, or seem to cease to exert a beneficial action, they should be immediately suspended, and resumed after such an interval of time as may seem good in the judgment of the surgeon. Like food and hygienic conditions, medicines, which are very beneficial at one moment, lose their power after a time, and then require to be changed or modified, either in form or quantity, until the appetite for them returns. This is a very necessary rule to be borne in mind in the management of so obstinate a class of diseases as those of the skin.

For the treatment of lupus and lepra, I must refer my readers to the special essays on those subjects in a previous chapter; and for further illustrations of my views on the treatment of constitutional syphilis, to my work on that subject.

CHAPTER XV.

DISEASES ARISING FROM ANIMAL POISONS OF UNKNOWN ORIGIN, AND GIVING RISE TO ERUPTIVE FEVERS.

THE diseases assembled under this group are the exanthematous, or eruptive fevers; the poisons from which they originate are the rubeolous, scarlatinous, and variolous; and the manifestations of these poisons are as follows:

Rubeola, Variola,
Scarlatina, Varicella,
Vaccinia.

These eruptions are characterized by fever of greater or less severity, which precedes and accompanies the exanthem; by an exanthem, or inflammatory congestion of the derma, which makes its appearance in the form of red points, and pursues a specific course; and by their mode of termination, namely, in resolution and desquamation of the epidermis in the first two, and by exudation and incrustation in the variolous affections; while all are liable to terminate by delitescence.

Taking this view of the exanthematous diseases, I conceive myself warranted in placing the variolous affections in a group with which all their analogies harmonize. They correspond accurately with the definition given above; the premonitory symptoms present a close resemblance to those of rubeola and scarlatina; the eruption is identical at its first appearance; and the general management required is the same. At a later period, when variola assumes the pustular form, it must be regarded, as far as pathology is concerned, in the light of an advanced stage of rubeola and scarlatina, or as a severe type of the latter diseases expending its violence on the skin, instead of retrograding on the mucous membranes. At the present day we should not hesitate to admit the variolous diseases to a place among the exanthematous fevers, nor to remove them from the unpathological position which they occupy among the Pustulæ and Vesiculæ of Willan's classification,

The severity of the febrile symptoms of exanthematous diseases is determined primarily by the nature and activity of the exciting cause of the disease, by the state of constitution of the person affected, and by the greater or less freedom of evolution of the morbific action upon the tegumentary textures. Secondly, it is modified by the extent

and severity of the exanthem, or, in other words, by the reaction of the effects upon the system. The constitutional symptoms are also much modified by the extent of surface diseased. When that surface is great, as is necessarily the case, where, not merely the dermal layer, but the whole mucous membrane of the body is affected, the peripheral and sentient parts of a considerable proportion of the nerves of the body are involved in the inflammatory disorder, and, as a consequence, the spinal and cerebral symptoms reach their highest pitch of severity and danger.

The congestion of the superficial capillary vessels which accompanies the exanthematous fevers is not limited to the dermal tissue alone, but is distributed more or less completely over the tegumentary surface of the entire body, including the mucous membranes. From the great susceptibility of the latter, they are generally the first affected, as we perceive to be the case in the angina of scarlatina, and the catarrh and conjunctivitis of rubeola. But there is this difference between the inflammation of the cutaneous surface and that of the mucous membrane: in the former, the inflammation either invades the entire surface at once, or runs regularly and more or less rapidly over it; but in the mucous membranes, the different parts are affected irregularly and in succession, while some escape altogether. Thus, in scarlatina, the mucous membrane of the fauces is first invaded, then possibly that of the lungs, while, perhaps, at the close of the disease, when a favorable convalescence is expected, the inflammation may be transferred to the alimentary canal, or kidneys, and prove fatal by exciting an uncontrollable diarrhœa or anasarca. The same remarks apply to rubeola; for after the violence of the cutaneous efflorescence has passed away, there is much to be apprehended from secondary inflammation of the mucous membranes.

The immediate seat of the inflammatory congestion of the exanthemata is the vascular rete of the derma, and the difference of tint observable in these diseases at their height and during their decline, is sufficiently explained by reference to the structure and normal phenomena of the skin. When the degree of excitation of the cutaneous nerves is small, and the arterial determination but little exalted above the ordinary standard, the vascular rete of the derma is only partially congested, and the redness produced by this congestion is slight; when, however, the nervous activity is aroused to its highest pitch of energy, as in scarlatina, the congestion is intense, and the bright scarlet of the arterial blood coursing through its vessels is little obscured by the thin veil of epidermis which holds it in its sphere. The congestion in rubeola, scarlatina, and variola, is not confined to the horizontal strata of the vascular rete of the derma, but implicates also the vertical rete of the follicles, and in that manner gives rise to the punctiform and papillar appearance of the redness which is characteristic of these eruptions.

The crescentic, or, rather, the imperfectly circular, form of the congested patches seen in rubeola, depends upon a peculiarity in the distribution of the cutaneous nerves and vessels, and corresponds with that natural appearance of the skin, which is so frequently seen in

healthy children, and which is denominated mottled. Again, I have observed, that, in injecting the limb of an infant with size and vermilion, I can imitate all the forms of redness seen in the exanthematous diseases, by ceasing to inject from time to time, or by filling the capillaries to their uttermost.

The decline of congestion of the derma is accompanied by certain alterations in the tint of redness which betokens its presence. Thus the red patches are observed to lose their vivid brightness, to become duller in their hue, and to pass through various shades of purple, until they become bluish and livid. These changes depend upon the degree of excitement of the cutaneous nerves at the several periods indicated by alteration in the color of the exanthem. When the nervous energy is at its highest point, the capillaries contract actively upon their contents, and maintain a rapid current of arterial blood through their channels, but, as the nervous excitement becomes gradually allayed, the capillaries lose their power to contract, and become distended by the full stream that moves more and more tardily onwards in its course, giving time for the arterial current to combine with the carbon of the tissues through which it flows, and be converted into venous blood.

The above phenomena will explain, also, the differences of color which the exanthem may assume at an earlier period than its decline, and even from the commencement of its appearance, as, for instance, in scarlatina maligna, or more strikingly, in rubeola nigra. The first step or motive influence by which this change is effected, is depression of nervous power; this depression, depriving the capillaries of their tonicity, or, in other words, of their means of resisting the pressure of the arterial current, they yield, they become dilated, and from capillaries, which they were, they are converted into a venous plexus, through which the blood moves feebly and slowly, gathering carbon in its tardy course.

Congestion of the capillary rete of the derma necessarily gives rise to tumefaction, the extent of swelling being, to a certain degree, the measure of the increased quantity of blood distributed through the part. Hence it is obvious that all exanthematous patches must be raised above the level of the surrounding skin, even although the degree of tumefaction be really very slight.

Another cause of tumefaction in an inflamed and congested tissue also follows as a natural consequence from the over-distension of its vessels. I have endeavored to show that the nervous excitation of the part must have diminished before over-distension of the capillary vessels can take place, but, as soon as that change has ensued, another phenomenon is immediately developed, namely, transudation of the watery part of the blood into the surrounding textures, thereby physically relieving the congested vessels of their overload of fluid. The fluid which is thus transuded through the coats of the vessels is serum, containing in solution more or less of fibrin; and the seat of transudation, for the most part, the subcutaneous cellular tissue, where it gives rise to œdema. I may instance scarlatina in some cases as a particular illustration of this kind of tumefaction, although it will be found, upon close observation, to be much more extensively present

among the exanthemata. This important phenomenon is not confined to the dermal tissue; it occurs also in the mucous membrane, and sometimes with fatal consequences, as, for instance, in the laryngitis of scarlatina and rubeola, where it is apt to induce œdema of the glottis.

As the present group of diseases are infectious and contagious, it may be well to inquire the precise meaning which we attach to these terms. In their more usual acceptation, the terms infection and contagion relate to modes of transmission of a poisonous principle. When the transmission is effected by a material substance, and is brought about by actual contact, the term *contagion* (immediate contagion) is employed; but when transmission is effected through the agency of the winds, and at a distance, the mode of communication is designated *infection* (mediate contagion). In other words, when the poisonous principle is volatile, and capable of diffusion in the atmosphere, it is infectious; but when this diffusibility is absent, it is simply contagious. The difference between infection and contagion is, consequently, more apparent than real, and some of our most able writers use one or other of the terms to imply transmission, without reference to its mode. Thus, it is observed by Dr. Watson, "Since, in all cases, the disease is conveyed to the person of the recipient by particles of matter proceeding from the person of the sick, and since it seems very unimportant whether those particles are in a solid or in a gaseous form, whether they are imparted by direct contact of the two human bodies, or by being wafted through the air, or carried upon articles of clothing, I shall include both and all these modes of communication under the simple term, contagion. This, in fact, is what is done in common discourse: all disorders that are catching, I shall take leave to consider contagious."[1]

In whatever way the poisonous principle be brought to the body of a sound person, and with whatever part of his body it come in contact, whether with the cutaneous surface, with or without abrasion, as in contagion, or with both the cutaneous and mucous surface in infection, the mode of its reception by the system is the same. In the first instance, it is dissolved in the fluids of the body; and, in the second place, is conveyed by imbibition into the circulating current of the blood, thence to act on the nervous system, and alter its functions. Once introduced into the system, the poisonous principle possesses the remarkable power of exciting an action similar to that which existed in the body whence it emanated, the intention of that action being the reproduction of an identical poison. Liebig has compared this process to fermentation; as, when a particle of yeast is brought into contact with a fermentable fluid, the particle of yeast is itself lost, or is too insignificant to be traced further; but the action which it excites occasions the formation of an abundance of similar yeast.

In certain diseases regarded as contagious, another mode of transmission occurs; the principle of cantagion exists in the form of germs

[1] Lectures on the Principles and Practice of Physic. First edition, p. 655.

or seeds of a parasitical organism, which, wafted to a soil fitted for their nutrition, become developed, and assume an active growth. Of this kind are the parasitic fungi found upon the surface of the bodies of animals, and, according to some, the mycoderma of the crusts of favus. Langenbeck found fungi in the body of a man who died of typhus fever. Owen has seen them coating the internal surface of vomicæ in the lungs of the flamingo; and similar observations have been made by other observers.

The most interesting, as it is the most important of the phenomena of morbid poisons, is the modification which they produce in the system of the affected person. By virtue of this modification, the susceptibility to be excited by a similar stimulus, or to take on a similar action, is deteriorated, and, in many instances, entirely abolished. We might recur again to the simile suggested by Liebig, for we are incapable of again exciting fermentation in a fluid that has already fermented. It is upon this important principle that safety from a repetition of attacks of eruptive fever reposes; although the cause is somewhat different in the two cases; for in the one, the material of fermentation is exhausted; while, in the other, the ferment is assimilated, and the blood therefore rendered insensible to its presence.

RUBEOLA.

Syn. *Measles.* *Morbilli*, Ali-abbas. *Blactiæ*, Ingrassias. *Rubeolæ*, Sauvages. *Rosalia.* *Phœnicismus.* *Rougeole*, Fran. *Die Masern*, *Kindspecken*, Germ.

Rubeola, or measles, is an acute inflammation of the tegumentary investment of the entire body, both cutaneous and mucous, associated with fever of an infectious and contagious kind.

Upon the skin it is characterized by a patchy redness, which, on close examination, is found to be produced by numberless minute red points and pimples, aggregated into small patches of a crescentic and annular form. The efflorescence makes its appearance on the fourth day from the commencement of febrile symptoms, increases for another four days, and is succeeded at its decline by furfuraceous desquamation of the epidermis.

Rubeola usually attacks children and young persons, but may occur at any period of life; infants and adults, however, are but little susceptible of its influence. Its effects have been observed in the fœtus at birth (Hildanus), where the mother has suffered from the disease during pregnancy. The period of incubation of the contagion varies from seven to fourteen days, and the same individual may be affected more than once. Its punctated and papillated appearance depends upon the state of congestion of the vascular rete of the follicles, and the semilunar form of the patches, upon some unexplained peculiarity in the structure of the derma, probably having reference to the distribution of the cutaneous nerves. The mottled aspect of the skin of children in health and exposed to the cold, has the same

semilunar tracery, and an analogous state may be produced artificially by incomplete injection with size and vermilion.

The varieties of rubeola are four in number, namely:

Rubeola vulgaris,
" sine catarrho,
Rubeola sine exanthemate,
" nigra.

RUBEOLA VULGARIS.

Common Measles. Morbilli benigni; erethrici.

In rubeola vulgaris, the ordinary form of measles, the disease sets in with the usual symptoms of fever, namely, with chills, succeeded by burning heat, listlessness, languor, drowsiness, pains in the head, in the back, and in the limbs; frequent pulse; soreness of the throat, white tongue, with red edges and tip; thirst, anorexia, nausea, vomiting, frequent dry cough, and high-colored urine. These symptoms increase in violence during the first four days. On the third the conjunctivæ look red and inflamed, there is intolerance of light, and the eyelids are congested and swollen, while a profuse secretion of lachrymal fluid distils from the eyes, constituting *coryza*. The mucous membrane of the nose also pours forth a large quantity of watery secretion, and the irritation of this membrane gives rise to frequent sneezing. Inflammation of the mucous membrane of the larynx, trachea, and bronchial tubes, is indicated by hoarseness, impeded respiration, constriction and pain in the chest, and violent cough. Moreover, children are affected occasionally with spasm of the muscular system and convulsions, the consequence of reflex action of the spinal nerves; these spasmodic attacks are especially frequent where rubeola is complicated by dentition.

The cutaneous efflorescence of rubeola makes its appearance on the fourth day, and is attended with heat and itching; in children with a delicate skin, it appears occasionally on the third; and, in some instances, from exposure to cold, or deficient susceptibility of the skin, on the fifth or sixth. It is first perceived on the forehead and front of the neck, next on the cheeks, and around the nose and mouth; and if the interior of the latter cavity be inspected, it may be seen, with similar characters to those exhibited on the surface of the body, upon the mucous membrane of the fauces and pharynx. By the fifth day the efflorescence on the face reaches its height; it then appears upon the trunk of the body and upper extremities, and on the succeeding day upon the lower extremities. On the sixth day the rash upon the body and limbs reaches its height. The backs of the hands are the parts last affected, the rash appearing on them not before the sixth day, and sometimes as late as the seventh.

The efflorescence of rubeola, when closely examined, is seen to consist of innumerable punctiform dots and minute pimples, aggregated into small circular patches, which, by their increase or coalescence, assume an irregularly crescentic figure. The patches are slightly raised above the surface, and the entire skin is somewhat swollen. The color of the rash at its acme is a bright raspberry red; on the eighth day it presents a yellowish-red tint, and then gradually

fades to the normal color of the skin. The pimples are most frequently found mingled with the efflorescence on the exposed parts of the body, as upon the face and hands, and this is particularly the case in infants and adults. Occasionally miliary vesicles are observed to complicate the rash, and in a case recorded by Willan, inoculation with the lymph of these vesicles was found to produce a perfect attack of rubeola, which was communicated by infection to several other children.

The decline of the efflorescence takes place in the same order as its invasion, fading on the sixth day upon the face; on the seventh day upon the trunk and limbs; and on the eighth day upon the backs of the hands. On the ninth day the form of the patches is discoverable only by the presence of a pale yellowish discoloration, which slowly disappears. To these changes, a furfuraceous desquamation succeeds, which is attended with considerable itching.

Of the constitutional symptoms, some are relieved on the outbreak of the efflorescence, while others are aggravated. Thus the nausea and sickness subside on the fourth day, the restlessness and sense of oppression disappear on the sixth day, while the coryza, the catarrh, the hoarseness, and the cough, with the frequency of the pulse, decline on the seventh day. At about the ninth or tenth day, the resolution of the congestion of the intestinal mucous membrane is indicated by diarrhœa of some days' continuance. In the *Archives Généralés de Médecine* is mentioned the case of a child who became dumb in consequence of retrocession of measles. The power of speech, however, returned at the end of two years. The recital of this case is accompanied by another, in which a dumb child was restored to speech by a severe rubeola.

It has been already remarked, that the mucous membrane of the eyes and pharynx is visibly affected with the rash. Other symptoms which occasionally develop themselves during the progress of rubeola, indicate a state of congestion of the internal mucous membrane. Thus, in some cases, there is hemorrhage from the nose; in others, from the air-passages; and in females, not unfrequently from the uterus. Whenever the rash is checked in its course by cold or other causes, the constitutional symptoms are aggravated and dangerous, the congestion of the mucous membranes is greatly heightened, the tongue becomes brown and dry, and the patient delirious.

Although rubeola, when it runs its course regularly, is by no means a dangerous disease, yet, at its close, it is occasionally attended with severe and alarming sequelæ, which call for the most vigilant attention on the part of the medical practitioner. Thus the cough, after the subsidence of the rash, may return with increased force and frequency, be accompanied by a quickened pulse, impeded respiration, and symptoms of hectic fever, and lead to a fatal issue, by effusion into the lungs and chest, or by the development of scrofulous tubercles. Children are sometimes seized with difficulty of breathing, from swelling of the mucous membrane of the air-passages and larynx, and die, unless relieved by tracheotomy, in the course of a few hours. The conjunctivitis, which was symptomatic of the disease during its

progress, may continue in a chronic form, and give rise to ulceration of the eyelids. The inflammation of the pituitary membrane of the nose may merge into the chronic form, and pour out a purulent secretion. The mucous membrane of the mouth and fauces in infants may develop aphthæ and troublesome ulcerations; and in children of riper years, tumefaction of the lips and ulceration of the angles of the mouth. The salivary glands may become enlarged by the propagation of the inflammation along their excretory ducts. In some instances, abscesses resulting in fistulous ulcers have been formed in these glands. The diarrhœa, which usually ceases spontaneously after the lapse of a few days from the disappearance of the efflorescence, may continue uncontrollable for several weeks, and issue fatally from ulceration of the mucous membrane. The mucous membrane of the vulva may participate in the inflammation, become ulcerated, even slough, and give rise to occlusion of the aperture, as occurred in a little girl operated on by Mr. Ferguson.[1] The lymphatic system may sympathize in the effects of the cutaneous irritation, and occasion enlargement of the glands, which sometimes form abscesses and ulcers, or, where the mesenteric glands are affected, the little patient may be destroyed by interference with the current of the chyle. In other instances, secondary affections of the skin are developed, in the form of vesicles, pustules, and furuncles. When these cutaneous eruptions appear during the violence of the mucous irritation, the visceral disease is considerably relieved, and the recovery favorable.

Measles are most prevalent, and the accompanying catarrh most severe during the winter, and particularly during the first three months of the year. On the other hand, in the summer season, and during the warm weather, the disease, when it occurs, is mild and subdued.

"In measles, which are considered by Schönlein as the most highly-developed form of catarrhal disease occurring in the northern hemisphere, the urine changes with the varying stages of the disorder. In most cases, it more or less resembles the inflammatory type, it is red (as in inflammatory measles), acid, and sometimes jumentous (turbid), as in gastric measles, or deposits a mucous sediment during the course of the morning (as in catarrhal measles). Becquerel states, as the result of his observations, that the urine is generally inflammatory at the commencement of the febrile period. It becomes very dark, and of high specific gravity, and frequently deposits a sediment of uric acid; a small quantity of albumen was found in a few of the cases. During the eruptive period, the character of the urine changes; if the eruption is slight, and there is not much fever, it resumes the normal type; if the contrary is the case, the urine retains the inflammatory appearance. Becquerel did not meet with any case in which the urine was turbid or sedimentary towards the close of the eruptive stage.

"During the period of desquamation and of convalescence, the urine either returns at once to the normal state, or continues turbid and sedimentary for some time, or becomes pale, clear, and anæmic. In

[1] Lancet, vol. ii. 1850, p. 578.

three cases, anasarca came on during convalescence, but the urine did not contain albumen."[1]

RUBEOLA SINE CATARRHO.

This form of measles is perfectly identical with rubeola vulgaris, with the exception of the catarrhal and febrile symptoms, which are either exceedingly mild or wholly absent. The efflorescence is precisely similar, and follows the same stages. Rubeola sine catarrho is usually observed during the prevalence of an epidemic of measles, when some children will be found to be attacked by the milder variety, while the greater number are seized with the disease in its ordinary form. It is not unfrequently met with in one member of a family, when the rest of the children have the more severe disease; and this is especially the case where a number of children are congregated together, as in a public school. Rubeola without catarrh is sometimes the immediate precursor of rubeola vulgaris, and children affected by this form are more liable to a second attack of measles than those who have experienced an attack of the ordinary kind.

RUBEOLA SINE EXANTHEMATE.

As measles may occur, divested of their mucous inflammation, constituting the previous variety, so, in more rare instances, the febrile symptoms and mucous inflammation may be developed, with only a partial efflorescence, or, according to some authors, with no cutaneous affection whatever. Rubeola sine exanthemate, when it exists, is observed under the same circumstances with those in which the previous variety appears, namely, as isolated cases, occurring during the progress of an epidemic, among the members of a family affected with measles, or in a large assemblage of children. Sydenham refers to this form of disease under the name of febris morbillosa, and Gregory contributes additional testimony to its existence. "Guersent," says Rayer,[2] "has observed some individuals in families where measles prevailed, exhibiting all the other symptoms of the disease, except the eruption. I have myself several times seen cases of measles in which the eruption was incomplete, and which might have been referred to the morbillary fever of Sydenham; but I have never met with any instances like those mentioned by De Haen, Gregory, and Guersent, although my attention has been turned to these some years past."

RUBEOLA NIGRA.

Rubeola maligna. Black measles.

In a debilitated state of the system, the cutaneous capillaries become over-distended, and the circulation through them retarded, while some portion of their contents is effused into the surrounding tissues.

[1] Simon's Chemistry, vol. ii. p. 269.
[2] "Treatise on Diseases of the Skin," translated by Dr. Willis, p. 145.

This condition of the vessels gives to the efflorescence a purplish and livid appearance, with which a tint of yellow is intermingled, and, in certain situations, a variable number of small spots, bearing a close resemblance to petechiæ. This form of measles is rare, and has been described by Willan under the designation of rubeola nigra. It commences with all the characters of rubeola vulgaris, and runs the usual course until about the seventh or eighth day. At this period the pulse becomes quickened, there is great lassitude, with prostration of the vital powers, and the appearance of the rash alters to the purplish and livid hue above noted. Sometimes the constitutional symptoms put on a more severe character, the respiration is quick and impeded, the cough troublesome; the digestive organs much disturbed, with parched mouth and nausea; probably delirium and effusion into the serous cavities, with œdema of the cellular tissue. With these aggravated symptoms, the disease is likely to terminate fatally. Rayer remarks that he has "seen various examples of these livid measles in children laboring under tubercles of the lungs and chronic cæco-colitis, and who were exhausted by diarrhœa and hectic fever."

Rayer has also remarked a variety of "black or hemorrhagic" measles, which are unconnected with constitutional debility, and characterized by a vinous-colored efflorescence not disappearing under pressure with the finger. He met with this form in strong individuals, and he finds a transition to such a modification in the greater depth of color, and non-disappearance under pressure of some of the patches in an ordinary case of rubeola vulgaris.

Diagnosis.—The diagnostic characters of rubeola are, firstly, the affection of the mucous membrane, as indicated by redness of conjunctivæ, coryza, catarrh, sneezing, sore throat, and cough, by which the disease may be distinguished, even before the appearance of efflorescence; and, secondly, the crescentic and annular patches of the rash, with intermediate unaffected portions of the skin.

From scarlatina it is distinguished by the crescentic patches; the crimson or raspberry-like hue of the redness, and the presence of coryza, catarrh, and sneezing.

In roseola, although the rash is so similar as to have obtained for it the name of *false measles*, the accompanying fever and inflammation are so extremely slight as to suggest a doubt of its being measles.

The minute spots by which the efflorescence of rubeola first makes its appearance are like those of variola, especially on the face and forehead, where they are slightly papular; but upon the trunk and limbs this difference is generally apparent between them, namely, that in measles the red points are mere spots, while in variola they are distinctly elevated papulæ.

The cough of rubeola is at first dry and harsh; at a later period expectoration ensues, the expectorated mucus presenting some peculiarities which are deserving of notice. Rayer describes these appearances as follows: "At first mucilaginous, clear, and limpid; at the end of three or four days the expectoration becomes thick, rounded into pellets, smooth on the surface, of a greenish-yellow

color, remaining perfectly distinct from each other, and swimming in a large quantity of ropy and transparent mucus, similar to the matter coughed up by some phthisical patients. By-and-by this form of expectoration is changed for another which adheres to the bottom of the vessel, and seems composed of a grayish homogeneous mucus, mixed with air and saliva, and very similar to the ordinary matter expectorated during chronic catarrhal affections. In young people the expectoration is wanting, or not at all abundant; and many cases of measles occur in older subjects, without being attended with expectoration." Chomel remarks the following difference between the nummular expectoration of rubeola and phthisis, namely, that in the former the nummuli swim in a transparent fluid, and in the latter in one which is opaque.

Causes.—Rubeola seems to have originated in Arabia, the birthplace of variola and scarlatina, and to have extended with them to Europe and the rest of the world. It was first described by Rhazes. The most remarkable epidemics of measles which have occurred in this country are those of London in 1671, 1674, 1763, and 1768, having Sydenham for their historian; and the epidemic of Plymouth in 1741, recorded by Huxham.

Measles are the consequence of a special infection or contagion; under the influence of which conjoined with a favorable state of the spstem, rubeola is developed. In many cases the disease is sporadic or epidemic in its eruption, in others it is communicated by contagion. The experiments of numerous authors have shown that the exanthem may be transmitted by inoculating a sound person, either with the blood, with the fluid of the accidental vesicles which sometimes complicate the rash, or with the secretions of those affected with the disease.

Measles may occur at any period of life, but are most frequent in children. The disease is more universally contagious than any of the exanthematous fevers, but is only partially protective of the constitution; for instances are by no means rare, in which the same individual has been affected more than once. The most obvious condition influencing the attack of rubeola, is inflammation of any of the mucous membranes, such as catarrh, cough, &c. This, indeed, constitutes a morbillous constitution, and the disease is most prevalent at the period when such a constitution is most likely to exist, namely, during the early months of the year. Successive epidemics of measles are usually characterized by some peculiarity, either in the intensity of the disease, or variety in the affection of especial organs.

Patients affected with measles must be secluded from those who are sound, in order to protect the latter against contagion. The period for the maintenance of seclusion is not rightly determined, but for the sake of security should be prolonged to at least three weeks.

Prognosis.—Rubeola may generally be regarded as a mild disease, particularly when it runs its course regularly, when the symptoms of inflammation of the mucous membranes are not severe, and the season temperate. The circumstances which are calculated to render it serious are, irregularity in its course; its occurrence during dentition, pregnancy, after parturition, or in persons suffering for some time pre-

viously from chronic disorder of an internal organ, particularly the lungs; retrocession of the cutaneous eruption; acute affection of the viscera, as of the lungs, the alimentary canal, &c., or severe secondary disorder. Rubeola nigra is dangerous only when complicated with excessive debility, or with any of the unfavorable conditions above specified.

TREATMENT.—When the disease is mild and regular in its course, milk diet, subacid diluents, a moderate and equable temperature of the sick-chamber, quiet and rest, with some simple mucilaginous drink to ease the cough, will be all the treatment required. Indeed, the less the patient be interfered with by the employment of medicines, the better.

If the febrile symptoms run high, effervescent salines, saline aperients and diaphoretics, such as the citrate of potash, liquor ammoniæ, acetatis, with or without spiritus ætheris nitrici, ipecacuanha, and camphor mixture, may be employed; but active purgatives are calculated to be injurious, either by determining a retrocession of the eruption, or by exciting a diarrhœa not easily to be checked. Moreover, it must be borne in mind, that diarrhœa occurring at about the ninth or tenth day, is a natural consequence of the resolution of the fever. When from any cause the occurrence of the diarrhœa is protracted beyond its proper period, it may be admonished by a gentle purgative. An emetic at the commencement of the attack is approved by many practitioners, and is often useful.

When the cough is violent, the respiration frequent and difficult, with pains in the chest denoting inflammation of the lungs, abstraction of blood must be resorted to. In children, weakly adults, or old persons, leeches to the chest, or cupping in this region, will be sufficient. In persons of stronger habit, general bleeding from the arm may be found necessary. In the country, many patients will bear venesection with advantage, while in crowded towns or cities, this remedy must be employed with circumspection. As an auxiliary to bleeding, or as a representative when the system may be too weakly for its use, counter-irritation by blisters or stimulant liniments, will be found beneficial, and both remedies will be assisted by ipecacuanha or tartarized antimony. Opiates are available only after the violence of the febrile symptoms has subsided, and then they may be advantageously combined with a diaphoretic, as in Dover's powder.

Cold affusion has been recommended in measles, but has not gained friends, on account of the susceptibility to congestion of the mucous membrane of the respiratory apparatus. When, however, the skin is hot and dry, and so long as it continues so, sponging with cold water, or with vinegar and water, may be adopted with safety and comfort to the patient.

Should the efflorescence recede suddenly, and some internal organ become affected, blood must be withdrawn from the region of such organ, and the rash recalled by means of a mustard-bath and the application of a blister.

The ammonia-treatment, so valuable in scarlatina, is equally applicable to rubeola, and may be regarded as specific in this affection as

well as in scarlatina. The details of the treatment will be found under the head of "Treatment of Scarlatina." Dr. Charles Witt, in his pamphlet on this subject, mentions the case of five boys of one family attacked with rubeola; four were treated with ammonia and one without; the four former made a perfect cure; the latter, although originally the strongest, was weakly in health for two years after his recovery. Dr. Witt's treatment consisted in the administration of a mild dose of jalap; and subsequently five grains of sesquicarbonate of ammonia dissolved in water, every three hours, beginning one hour after the aperient dose. In a few hours the cough ceased, and the efflorescence broke out. After four days the disorder declined; for the two following days the ammonia was given every six hours, and on the seventh day was no longer necessary. The diet of the patients was beef-tea and veal broth. In a case of rubeola in the adult, preceded by intense headache, ten grains of ammonia in solution were given every two hours; after the third dose the pain ceased, the patient fell into a comfortable sleep, and awoke with an abundant efflorescence covering the skin.

Rubeola nigra requires no other treatment in addition to that above recommended, unless especial indications present themselves, in which case the latter must be managed according to the common principles of therapeutics; thus, for debility, tonics, mineral acids, &c., must be administered.

The sequelæ of rubeola call for a treatment especially directed to the nature of the secondary affection. For the cough and pulmonary affection, counter-irritants externally, with diaphoretic salines and ipecacuanha internally, are best suited. Where speedy dissolution is threatened from swelling and œdema of the mucous membrane of the trachea and larynx, and where the local abstraction of blood by leeches has failed to afford relief, tracheotomy must be performed. Chronic conjunctivitis and ulceration of the eyelids are best treated by the application of blisters behind the ears, or upon the nape of the neck, with a weak solution of nitrate of silver, or a collyrium of sulphate of zinc and opium to the parts affected; anointing the borders of the lids at bedtime with simple cerate, to prevent their adhesion during the night. The same plan of management is adapted to the removal of unpleasant secretions from the ears, with the addition, in chronic cases, of an injection of a weak solution of chloride of lime. Aphthous vesications and ulceration of the mouth and fauces require astringent and acid gargles, or brushing by means of a sponge with a weak solution of nitrate of silver. In children, too young to employ these remedies, a linctus containing the biborate of soda may be found sufficient. Ulceration around the mouth will speedily yield to nitrate of silver, or a solution of chloride of lime. When the salivary glands are enlarged, and threaten to suppurate, this termination may generally be prevented by the application of a small blister over the tumefied organ, or by blistering the surface with the nitrate of silver. The diarrhœa may be permitted to continue, unless it be prolonged for too long a time, and occasion debility and constitutional irritation. When such an event is anticipated, the best treatment will be found to be, the application

of a blister on the abdomen; frictions of the legs, with a stimulating liniment; mercury with chalk or rhubarb and magnesia, internally, in the first instance, succeeded by chalk mixture, and the usual means for checking diarrhœa. When the lymphatic glandular system is affected, the liniment of croton oil, rubbed on the integument covering the enlarged glands, will be found of great service. Indeed, any treatment for the relief of the sequelæ of measles will be inefficient, unless it be accompanied by counter-irritation. It is upon this principle that the secondary eruptive affections of the skin are found to conduce so materially to the cure of the internal disorder. These eruptive affections are therefore not to be repelled, without establishing in the first instance a more manageable form of counter-irritation, such as an open blister, &c., in which case the eruptions will gradually disappear.

During convalescence, the patient should be protected from pulmonary affections by warm apparel, and avoidance of a cold and damp atmosphere.

SCARLATINA.

Syn. *Scarlet Fever. Febris scarlatina. Morbilli confluentes. Rubeola rossalia. Scarlatine*, Fran. *Scharlachfieber, Scharlachaufschlag*, Germ.

Scarlatina is an acute inflammation of the tegumentary investment of the entire body, both cutaneous and mucous, associated with fever of an infectious and contagious kind. It commences with fever which invades at an indefinite period between the second and the tenth day[1] after exposure to infection or contagion. On the second day of the fever, the eruption is developed in the form of minute points and papulæ, which constitute patches of large size, or a general efflorescence of a vivid scarlet color. The rash terminates at the end of six or seven days, leaving the skin rough and harsh, and the epidermis peeling off in furfuræ and thin laminæ.

The varieties of scarlatina, which are merely modifications in degree of one typical affection, are four in number, namely:

Scarlatina simplex,	Scarlatina maligna,
" anginosa,	" sine exanthemate.

SCARLATINA SIMPLEX.

Scarlatina benigna; erethrica. Scarlatina sine anginâ.[2]

Scarlatina simplex, the most benign form of scarlet fever, commences with a feeling of languor and lassitude, with pains in the head, in the back, and in the limbs; with drowsiness, nausea, and rigors, these being succeeded by heat, thirst, and the usual symptoms of pyrexia, and increasing towards evening. Upon the breaking out of the efflorescence, the pulse is quick, but feeble; the patient is

[1] An exceptional case is reported by Dr. Duncome, of the Bahamas, wherein the poison remained latent for eleven weeks.

[2] Dr. Robert Williams.

anxious, depressed in spirits, agitated, restless, and sometimes delirious. The eyes are red and humid, but without lachrymation; the face is swollen; the tongue covered in the middle with white mucus, is studded with congested papillæ of a vivid red color, and red along the edges; the tonsils are enlarged, and the palate and pharynx red. There is a frequent dry cough, a troublesome tingling and itching sensation of the skin, and swelling of the hands and feet. Sometimes, however, it happens that the eruption of scarlatina occurs without pain or febrile symptoms.

On the second day from the commencement of these symptoms, the efflorescence appears upon the face, neck, and breast, in the form of minute points, which become aggregated into patches of irregular form and size. By the third day, the rash has extended to the trunk of the body and upper extremities, and to the mucous membrane of the eyes, nose, mouth, pharynx, and air-passages; and by the fourth day, to the lower extremities. The patch-like distribution of the eruption is its normal character upon the trunk of the body. On the face, the neck, and upon the limbs, it speedily becomes continuous and diffused. The skin is hot and itching, and fully distended by the congestion of its vessels. The scarlet surface is sometimes uniform and smooth (*scarlatina plana vel levigata*), at other times, and in some situations, it is dotted with elevated points of a deeper tint than the adjoining surface, and is rough and granular to the touch (*scarlatina papulosa vel milliformis*), and occasionally, though rarely, it is accompanied by the development of serous vesicles (*scarlatina vesicularis, vel phlyctænosa, vel pustulosa*). The efflorescence attains its most vivid redness upon the evening of the third or fourth day after its commencement. It is always brighter in the evening than in the morning, and in certain parts of the body, as upon the loins, the nates, and flexures of the joints, than upon the rest of the surface.

The decline of scarlatina commences on the fifth day from the eruption; the redness diminishes on those parts first, where it first appeared; islets of skin of a natural hue begin to be apparent in the midst of the redness, and epidermal desquamation occurs upon the face and neck. On the sixth day the efflorescence has still further decreased, and on the seventh has nearly disappeared. On the eighth and ninth days the desquamation of the epidermis has become general, and, in many parts, laminæ of considerable size are thrown off. The resolution of scarlatina is sometimes accompanied by a sudden and temporary renewal of the rash, preceded by a febrile paroxysm.

"In all the acute exanthemata the urine very frequently presents," as Schönlein remarks, "a peculiar character, which is due, in many cases, to an admixture of the bile-pigment; it has a dark-brown color, and resembles badly fermented beer in appearance. At the commencement of the crisis the urine becomes clearer, and forms a pulverulent sediment, consisting of uric acid (and, perhaps, urate of ammonia).

"In scarlatina, the urine, at the commencement, while there is considerable fever, is of a deep dark-red color, and possesses all the properties of inflammatory urine.

"In children the urine is always less colored than in adults, and its color, in this disease, is proportionately less dark.

"It almost always has an acid reaction, and only exhibits a tendency to become rapidly ammoniacal when the disease is associated with a nervous or septic condition of the system. Any sediments that may be formed, consist, for the most part, of urate of ammonia and uric acid, mixed with a greater or less quantity of mucus; blood-corpuscles are occasionally noticed. When the urine is ammoniacal, viscid whitish sediments of the earthy phosphates are deposited, and if there is much gastric disturbance the urine becomes jumentous (turbid). Albumen is commonly but not always found in the urine during the period of desquamation. Dropsy may even supervene without the urine becoming albuminous; it is sometimes preceded by the occurrence of hæmaturia."[1]

Simon further observes, in reference to the contradictory opinions put forth with regard to the presence of albumen in the urine: "We have dropsical symptoms with albuminuria, dropsical symptoms without albuminuria, and albuminuria without dropsical symptoms." Solon found albumen in the urine in twenty-two out of twenty-three cases of scarlatina. On the other hand, Philipp[2] observed, in Berlin, where scarlatina was recently very prevalent and anasarca could not be warded off, at least sixty cases in which the urine was tested both with heat and nitric acid, and no trace of albumen could be detected. Simon remarked that a desquamation of the mucous membrane was ascertained by the presence of numerous epithelial cells in the sediment, a condition which frequently preceded the desquamation of the epidermis.

SCARLATINA ANGINOSA.

Scarlatina mitior.[3] *Angina scarlatinosa.*

Scarlatina anginosa is a modification of simple scarlatina, and is especially characterized by severity of the inflammation of the mucous membrane of the fauces and pharynx, and by swelling and ulceration of the soft palate and tonsils.

The primary symptoms of this variety of scarlatina are identical with those of the simpler form of the disease, but more violent. The fauces, from the commencement, and often before the invasion of the symptoms, are redder than natural. There is rapidly increasing sense of constriction about the throat, and a stiffness of the muscles of the neck and jaw. Upon the second day of the febrile symptoms, the throat feels rough, the voice is hoarse, there is a collection of viscous mucus in the fauces, and deglutition is painful and difficult. On the third and fourth days the redness of the fauces has increased, the mucous membrane looks turgid and swollen, and is studded with patches of false membrane and superficial ulcerations. The uvula and tonsils are so much enlarged as nearly to block up the isthmus faucium, and the tongue is coated with white mucus, and appears set

[1] Simon, Animal Chemistry.
[2] Casper's Wochenschrift, 1840, No. 35.
[3] Dr. Robert Williams.

with red gems, from the congestion and elongation of its papillæ. While the local affection is thus rapidly progressing, the constitutional symptoms are indicative of serious and dangerous disturbance. There is nausea with vomiting, quickened respiration, a quick and feeble pulse, great languor and restlessness, headache, delirium, and excessive heat of skin, 104° or 105°. Heberden observed the temperature of the surface, as indicated by the thermometer, to be 112 degrees of Fahrenheit.

When ulceration of the mucous membrane of the fauces occurs, the inflamed surface is seen to be studded on the second or third day, with a number of white patches, around which the congested vessels form a zone of deep red. From the fifth to the tenth day the whitish patch or false membrane is thrown off, and leaves a small superficial ulcer, which quickly heals. Ulceration takes place chiefly in irritable constitutions, and at certain seasons of the year, as, for instance, during the autumnal and winter months.

The cutaneous eruption in scarlatina anginosa is retarded by the severity of the affection of the mucous membane, and of the constitutional symptoms. It fails to appear until the third day, and is then only partial in its efflorescence. Upon the trunk of the body it forms scattered patches of variable size, while upon the limbs it is developed chiefly around the joints. It endures longer than the eruption of scarlatina simplex, and the desquamation which ensues upon its decline is less regular and extensive. Occasionally the rash disappears suddenly the day after its eruption, to return in a day or two. This occurrence takes place more frequently in the autumn and winter season than during the rest of the year, and is either fatal in its consequences, or an aggravation of the constitutional severity of the disease.

The decline of the eruption takes place on the fifth or sixth day, and at the same time the severity of the inflammation of the fauces subsides, the sloughs are thrown off, and the ulcerations begin to heal. The latter process, however, and the disappearance of the congestion of the mucous membrane are not accomplished before the fifteenth or twentieth day. When the throat and fauces only begin to be affected at the height of the rash, or even at its decline, the dispersion of the inflammation is postponed till a later period. The constitutional symptoms follow in the train of the affection of the throat.

SCARLATINA MALIGNA.

Scarlatina gravior;[1] *torpida*; *nervosa*; *putrida*; *septica*.

Scarlatina maligna is a highly aggravated form of scarlatina anginosa, occurring in persons of debilitated constitution, principally in the winter months of the year, and in damp, unhealthy and ill-ventilated situations. Sometimes it makes its attack sporadically, while at other times it invades suddenly and unexpectedly during the progress of scarlatina simplex or anginosa.

[1] Dr. Robert Williams.

The chief characteristics of scarlatina maligna are the extreme prostration of the powers of the system, the absence of swelling of the tonsils, and the extensive and deep sloughing ulceration of the fauces. The pulse in this affection is irregular, and scarcely perceptible; there is great restlessness, deafness, delirium, and coma. The eyes look red and sunken, there is an acrid secretion from the nose, which produces soreness and excoriation around the nostrils. The cheeks are swollen and aphthous. The lips, the teeth, and the tongue, are covered by a dark-brown or black fur. The tongue is enlarged and tender, or even ulcerated, and the tonsils are deeply ulcerated, and covered with dark-colored sloughs. Respiration is impeded, quick and rattling; there is a quantity of viscous phlegm in the pharynx; the breath is fetid; deglutition painful and difficult; there is stiffness of the muscles of the jaws, diarrhœa, and sometimes hæmaturia.

The eruption in this form of scarlatina is late in appearance; it is pale and indistinct, with the exception of a few patches of irregular size, which speedily become dark and livid, and mingled with petechiæ. "Their whole skin," writes Dr. Sims,[1] "instead of the scarlet, assumed a very remarkable appearance, which resembled nothing so much as that of a dead body which has been kept several days, or as if a mixture of blood and water were universally diffused under it, and could be seen through it." The duration of the rash is equally uncertain with its period of invasion. "In some instances the rash suddenly disappears a few hours after it is formed, and comes out again after the expiration of a week, continuing two or three days; in one case numerous patches of it appeared a third time on the seventh day from the second eruption, then remained for two days."

Scarlatina maligna is an extremely fatal disease, as may be inferred from the severity of its symptoms. Some patients are cut off at an early period, namely on the second, third, or fourth day, while others withstand its violence for a longer period. Those who perish early exhibit appearances of extensive ulceration in the fauces, larynx, trachea, lungs, or in the œsophagus and alimentary canal, after death. The great fatality of this disease may be inferred from the observation of Willan, that "in 1786–87 more than two-thirds of those who were affected with the scarlatina maligna died between the seventh and nineteenth day of the fever."

SCARLATINA SINE EXANTHEMATE.

Scarlatina sine eruptione.[2]

During the progress of an epidemic of scarlatina, some few cases have been occasionally observed, in which the fever and angina were present, but without any, or with a scarcely perceptible efflorescence. Such an instance once fell under my own notice, in a weakly child, who slept in the same apartment with three of his brothers and sisters,

[1] Memoirs of the Medical Society of London.

[2] Dr. Robert Williams.

suffering from the ordinary attack of scarlatina simplex. This form of the disease is more frequent in a secondary attack, before the health has become completely re-established, than as a sporadic variety, and is more likely to occur in the adult than in children.

ACCIDENTAL MODIFICATIONS OF SCARLATINA.

When so extensive a surface of the body is affected as that which is the subject of disease in scarlatina, it is natural to expect that many modifications may arise from circumstances apparently trivial, such as those which are referable to age, constitution, season, &c. Thus, while, on the one hand, cases may occur in which all the constitutional symptoms are present without the efflorescence, on the other hand, the very reverse of this may happen. Dr. Sims remarks: "In one child the scarlet fever appeared without any angina, and, having finished its course, left the patient seemingly in perfect health; but in a few days the fever returned without any eruption, but with a very considerable degree of sore throat, and much pain and swelling of the tonsils and parotids, which likewise ran its course, as if the former symptoms had never appeared." The same author observes, that during the periods of the year which are unfavorable for scarlatina, namely, in autumn and winter, "a frequent, short, hacking cough took place in several patients," without expectoration; that this symptom was most severe where the cutaneous eruption and affection of the throat were the slightest. "Another circumstance, in the months of November and December, was, that a few days after the apparent change of the disorder, a swelling attacked the face, but more frequently the extremities, attended with the most excruciating pain." "Some first complained of a violent toothache; after two or three days they complained of an equally violent pain in the back, the first one gradually subsiding. In a day or two more, or even sooner, the pain attacked their elbows, wrists, and hands, which were usually the parts last attacked."

Dr. Watson[1] and Dr. Corrigan[2] have pointed out an occasional variety of scarlatina anginosa, in which there is great and rapid swelling under the angles of the jaw, without a corresponding inflammation of the fauces. The patient suffers much from pressure upon the cervical vessels and nerves, and the cellular tissue frequently passes into the state of sloughing. At the outset of the swelling Dr. Corrigan found a few leeches of service; but he warns us against their use, if the inflammation be fairly established, and he especially indicates the danger of incisions.

SEQUELÆ OF SCARLATINA.

The development of the exanthema, upon certain parts of the body, is always accompanied by more or less œdema of the subcutaneous cellular tissue. In the majority of cases this œdema is removed by absorption of the serous effusion at the decline of the eruption, but occasionally it terminates in ulceration or mortification. "Two

[1] Lectures on the Practice of Physic. [2] Clinical Lectures.

instances of this tendency to mortification occurred in two children lately admitted into St. Thomas's Hospital. In one, the whole of the toes of the right foot had sloughed off, and the integuments of the leg had mortified from the knee to the foot. In the other, mortification of the upper lip had commenced, and continued to spread till nearly one-half of the face was eaten away. The former patient recovered, the latter died. This tendency to mortification is common to many parts of the body. Dr. Watson, in his account of the fever that prevailed in the London Foundling Hospital, gives one case that died of mortification of the rectum, and also six others that died sphacelated in various parts of the body. In the girls, some had the pudendal region mortified; two had ulcers of the mouth and cheek, which sphacelated externally; while one had the gums and jaw-bone so corroded, that most of the teeth fell out before she died. The lips and mouth of many also that recovered, were ulcerated, and continued so for a long time."[1]

In other cases, at the close of scarlatina, and during convalescence, namely, during the period intervening between the tenth and twentieth day, and sometimes as early as the fifth or sixth day, anasarca is developed. This sequela, which is referable to the transfer of inflammatory action to the structure of the kidneys, is indicated by languor, headache, restlessness, and symptoms of general constitutional disturbance; to these succeed œdema of the face and lower extremities, and, in a short space of time, of the entire body. Subsequently, effusions, frequently containing urea, take place into the serous cavities, and the case becomes serious. The urine is deficient in quantity, of that peculiar smoky color which indicates the presence of albumen, and is frequently colored by the presence of blood, the consequence of impeded circulation in the kidney and rupture of the capillaries of the Malpighian bodies, or turbid, and deposits a whitish sediment. Anasarca is usually regarded as a consequence of exposure to cold and damp, during the progress of scarlatina, or at too early a period after convalescence; but it may also result from any cause capable of arresting or diverting the natural course of the disorder; in other words, of preventing the elimination of the animal poison, which is the essence of the disease. Hence an imperfect or checked eruption is the common precursor of anasarca, or it may occur after the subsidence of the cutaneous efflorescence, when an undue amount of poison still remains in the blood, and an excess of duty is forced upon the kidneys, the latter organs being already weakened by congestion, imperfect circulation, and accumulation of epithelium, and possibly, of fibrinous cylinders in their tubular structure.

Anasarca sometimes proceeds from another cause than inflammation and congestion of the structure of the kidneys, namely, from anæmia. This happens in children naturally weakly and pallid, and is less serious than the inflammatory form. It may occur as early as the fourth day of the eruption, or at any later period; the features in this case are contracted and pallid, the tongue and lips bleached, and the skin pale;

[1] Elements of Medicine. By Robert Williams, M.D. Vol. i. p. 127.

there is little or no fever; the urine is pale, often neutral from the presence of phosphatic salts, and contains neither albumen, blood-corpuscles, nor epithelial cells. The cause of the dropsy in this instance appears to be defect of fibrin in the blood, and want of power to excrete the urea. The œdema begins in the vicinity of the joints.

Besides the preceding, inflammation and effusion of serum and pus may take place into the joints. The mucous membranes also suffer; the inflammation of the conjunctiva sometimes becomes chronic, and lasts for a considerable time. Inflammation of the mucous lining of the tympanum and Eustachian tube may terminate in deafness, and that of the meatus auditorius in chronic suppuration. Occasionally ulcerations are formed around the nose and mouth; thickening of the upper lip may also occur; aphthæ of the tongue and mouth, or inflammation of the salivary glands. When parotiditis ensues in the adult, it is apt to produce considerable swelling of the gland, which continues for a long period; in children inflammation of this gland, and of the submaxillary glands, may give rise to asphyxia, or terminate in suppuration and abscess. Other sequelæ of scarlatina anginosa are, chronic enlargement of the lymphatic glands of the neck, swelling of the testes, chronic bronchitis, chronic diarrhœa, &c., and, according to Dr. Scot Alison,[1] pericarditis.

In scarlatina maligna the sequelæ are severe and dangerous, and often prove fatal after the secondary stages of the fever have subsided. To the tertiary affections above detailed may be added, as occasionally following in the train of scarlatina maligna, ulceration of the mucous membrane of the larynx, trachea, and œsophagus; ulceration of the mucous membrane of the intestines, protracted cough, dyspnœa, suppuration of the salivary glands, enlargement and suppuration of the lymphatic glands of the neck, sloughing of the nates, and hectic fever.

Diagnosis.—The especial diagnostic characters of scarlatina are, *firstly*, the decided and acute affection of the fauces; *secondly*, the early appearance (2d day) and rapid extension of the efflorescence; and *thirdly*, the bright scarlet and diffused character of the rash, and its frequent interspersion with red papulæ.

Between scarlatina and rubeola the closest analogy undoubtedly subsists, and when the natural characters of the two affections are considered, the analogy approaches almost to identity; thus both are inflammations of the tegumentary surface of the body, internal and external; both are accompanied by a cutaneous efflorescence, involving the vascular rete of the derma; both are liable to be succeeded by serious affections of the viscera, into the structure of which mucous membrane enters as a constituent part; both appear during the prevalence of the same epidemic, engendered apparently by the same infection; one may follow on the other as a consecutive disorder; both are infectious, and both are contagious. In practice alone is it necessary to distinguish between these exanthemata. We will, therefore, inquire what are the distinctions which we are enabled to establish between them.

[1] Medical Gazette, 1845.

Scarlatina.	*Rubeola.*
1. Precursory symptoms of one day's duration.	1. Precursory symptoms of three days' duration.
2. Mucous membrane of the eyes, nose, and fauces, red and inflamed, without secretion; pain and soreness of throat; no cough; no expectoration.	2. Mucous membrane of the eyes, nose, and fauces, red and inflamed, with increased secretion, coryza, sneezing; dry cough at first, subsequently expectoration.
3. Eruption on the second day of the fever; invades the entire surface of the body in three days; disappears by the end of the seventh day.	3. Eruption on the fourth day of the fever; occupies three days in invading the entire surface of the body; disappears by the end of the eighth day.
4. The efflorescence occurs in large irregular patches, or is more or less generally diffused; is of a bright scarlet, compared by Willan to a "boiled lobster's shell," and frequently interspersed with numerous small red papulæ.	4. The efflorescence occurs in small crescentic and annular patches, with intervening unaffected portions of the skin; the color is darker than in scarlatina, with "nearly the hue of a raspberry," and interspersed with numerous small red papulæ, disposed in clusters.
5. Odor resembling old cheese.	5. Odor sweetish, until the decline of the eruption, then sourish.
6. Principal sequelæ: anasarca, inflammation of joints, gangrene, chronic bronchitis, ulceration of fauces, conjunctivitis, otitis, abscess of salivary glands, chronic diarrhœa.	6. Principal sequelæ: the same as scarlatina, with the exception of anasarca, inflammation of joints, and gangrene.
7. Exfoliation of the epidermis in laminæ.	7. Exfoliation of the epidermis in furfuraceous scales.
8. Less infectious and contagious than measles.	8. More infectious and contagious than scarlatina.
9. Rarely attacks the same person more than once.	9. Frequently attacks the same person twice.

The differences above stated amount at most to one of *degree*, the infection being the same in both disorders. Thus, while both are constituted by inflammation attacking the same textures of the body, scarlatina, during its *first stages*, is more rapidly and actively determined to the cutaneous surface; the mucous membrane, in an equal ratio, escaping the violence of the inflammatory action. The contrary is the case with regard to rubeola; here the cutaneous determination is tardy and partial, while the mucous affection is gradual, severe, and prolonged. During the *second stages*, on the subsidence of the cutaneous congestion, the mucous membrane may suffer more or less in both, according to a variety of circumstances, such as the greater or less exhaustion of the morbific influence in the skin, the state of the nervous system, &c. These stages have no natural course in either disorder; new and accidental or previously existing conditions determining the resolution of the inflammation, or its attack upon some weak point of the mucous membrane.

Scarlatina sine exanthemate is distinguished from cynanche maligna by the symptoms which indicate the presence of an acute disease, and one producing a powerful impression on the vascular and nervous systems. The alimentary system is also much disturbed; there is vomiting and diarrhœa, and the disease is apt to run its course to a fatal termination in the lapse of a few days, or within the first week. Angina maligna, on the other hand, is slow and gradual in its progress, extending by degrees, from the point first attacked along the trachea and bronchial tubes, giving rise to the formation of false

membranes in its course, and attended with little constitutional disturbance, however severe may be the local affection. In a word, the observation of these two diseases exhibits, in the former, fatality in its cause; in the latter, fatality in its effects.

CAUSES.—The cause of scarlatina is an infection, or contagion, apparently identical with that of rubeola. It makes its attack in the form of an epidemic, and prevails mostly in the spring and autumn seasons of the year. The atmospheric conditions favorable to scarlatina are cold and moisture combined, and the existence of this state of the weather for any time gives rise to a medical constitution, in which scarlatina is apt to be developed. When epidemics of scarlatina and measles occur at successive periods, with an interval of a certain number of years, it would appear that the fresh invasion is determined by an increase in the numbers of the population who have not yet suffered from the disease, and who are consequently susceptible of its influence. Scarlatina is less contagious than rubeola, and affects children and young persons chiefly; but many instances occur in which adults, and especially puerperal patients, have suffered from this disease. Scarlatina rarely attacks the same person more than once, and is less easily communicable by inoculation than measles. For protection against the propagation of the contagion, patients recovering from scarlatina should be secluded for a month or six weeks.

It is worthy of remark, that an angina pseudo-membranosa, or diphtheria, complicated in some cases with scarlatina, not unfrequently takes place, on the Continent, in an epidemic form. In an epidemic of this disease lately reported to the Academy of Medicine, as having occurred at Lion-d'Angers, it prevailed for the first six months of the year. During the same period horses suffered from a similar affection, colts from acute enteritis, and cattle, sheep, and pigs, from phlyctenoid fever.

PROGNOSIS.—The prognosis of scarlatina will be much influenced by the nature of the prevailing epidemic. It sometimes invades with such overwhelming rapidity as to destroy life before any pathological changes can be effected. Scarlatina simplex is wholly divested of danger when it passes regularly through its course. It may, however, be rendered grave by retrocession, or by complication with disease in any of the viscera. "The prognosis is unfavorable if the delirium commence, as it frequently does in children, and sometimes also in adults, a few hours after the seizure. In these cases the child often dies on the third or fourth day, and the adult on the eighth or tenth. The tongue becoming brown; or, a clean tongue, with a rapid, fluttering pulse, are unfavorable symptoms. A sudden fading of the eruption, or its changing to a livid color, are symptoms of danger. The danger of scarlatina is increased by dentition. Pregnancy also adds to the danger, as the woman frequently miscarries. The prognosis is also extremely grave when it attacks women immediately after parturition." "The fauces becoming livid under any circumstances, or an acrid discharge from the nostrils, or else the formation of an extensive abscess in the neck, accompanied with

severe purging, are all unfavorable symptoms. The appearance of mortification in any part is commonly, but not universally fatal. Affection of the joints is a grave, but by no means a fatal symptom."[1] The appearance of hemorrhage from the mucous membrane of the nose at the commencement of the exanthema is regarded as a favorable sign.

TREATMENT.—The principle of treatment in scarlatina is to endeavor to purify the blood of the morbid poison which it contains, and which is the cause of the disease, by calling into activity the various natural emunctories of the system, namely, the skin, the bowels, and the kidneys. The degree in which these powers should be set in action must be determined by the strength of the disease. In the mildest forms of the complaint the treatment should be of the simplest kind. Sydenham remarks, that none die of this disorder, except from a too great officiousness on the part of the practitioner, "nimia medici diligentia." The patient should be confined to the house, the sick apartment should be kept well ventilated, the patient's head cool, his feet warm, the bedclothes light; his diet should be sparing and unstimulating, with an abundant supply of diluent and acidulated drinks; conversation should be prohibited, and all sources of noise or moral excitement removed. To these hygienic means should be added, sponging of the skin with tepid vinegar; a daily warm bath, if the process can be accomplished without fatigue to the patient and danger of exposure; effervescent salines; mild diaphoretics, if necessary; gentle laxatives; and, at the decline of the fever, a mild tonic, such as the citrate of iron, or citrate of iron and quinine, and a little wine. During convalescence and after recovery, flannel should be worn next the skin.

But scarlatina is not always so slight a disorder as to be amenable to the simple antiphlogistic method of treatment above laid down; the want of a power of neutralizing the poison present in the blood, of a specific power, in fact, has long been felt by those who have the charge of treating this disease; and in the absence of such a power the practitioner is compelled to deal with the disorder cautiously and even doubtingly, for at any moment the fever may put on a serious and dangerous aspect, and that which was benignant at first, may, in a few days, assume a fatal character; or the type of the fever may be dangerous from the outset, for different epidemics of scarlatina differ in their qualities of danger, and in certain localities the fever is habitually more formidable than in others. Under these circumstances the importance of a specific remedy cannot be too highly estimated; a remedy which would control and neutralize the poison; that might be administered safely at any stage of the fever; that at the earliest dawn of the complaint would be prophylactic, and a certain cure in more advanced stages; that would prevent secondary affections, or conduct them safely through their course; in a word, that would render scarlatina one of the slightest of human afflictions, instead of being, as at present, one of the gravest of maladies.

[1] Dr. Robert Williams. Opus cit., p. 145.

Such a remedy, a specific for scarlatina, my own experience tells me does exist, and has been employed and advocated for a number of years past by able practical men. A remedy that, in its power over scarlatina and rubeola, and probably variola, may be ranked with quinine in ague; iron in erysipelas; arsenic in eczema; sulphur in scabies; and mercury in syphilis. This remedy is the sesquicarbonate of ammonia, and has for its promoters and advocates, Peart,[1] Wilkinson,[2] and Dr. Charles Witt.[3] The average dose for an adult is five grains in simple solution in water, administered every one or two hours throughout the course of the complaint. For an infant or child the dose may be two grains; and in severe cases it may be carried as high as ten grains. "Dr. Peart gave six-grain doses in cases of unusual severity. Mr. Wilkinson rarely gave less than three grains, increasing the dose, according to the age of his patients, to ten grains, and repeating it more or less frequently according to the urgency of the case." Dr. Witt, in a case mentioned in his pamphlet, administered seven grains, "every hour, for the space of twenty-four hours, and during every alternate hour for the next like space, not only with perfect safety, but with complete success."[4] "Perfect quietude is especially required under the operation of this medicine. The patient is thrown by it into a sleepy state, as nearly as possible resembling the repose of health, and as long as that inclination remains, which is much to be desired, it should not be interrupted. In aid of this, the room should be somewhat darkened." The remedy possesses the power of tranquillizing the nervous system, calming nervous irritability, and conducing to sleep; it favors the development of the cutaneous efflorescence; it reduces heat, fever, and delirium; and, after a few hours, subdues any urgent complications that may be present, whether of the brain, the lungs, or the bowels. The sick apartment must be sufficiently ventilated, with an avoidance of draughts of cold air that might chill the surface and repel the eruption.

It is important in the administration of ammonia, that it should be given alone; that nothing should be permitted in the diet of the patient that could neutralize its effects, such as acid drinks and fruits. The drink should be simple water, or toast and water; the bowels should be regulated by gentle means, and the diet suited to the progress of the patient; gruel, milk, and, as the fever subsides, broths and light nourishing food.

[1] Practical Information on the Malignant Scarlet Fever and Sore Throat.

[2] Remarks on Cutaneous Diseases. 1822.

[3] An Effectual and Simple Remedy for Scarlet Fever and Measles, with an Appendix of cases. 3d edition. 1862.

[4] The case here referred to was peculiarly interesting, as showing the occasional irregular manifestation of the poison of scarlatina. The patient, a young lady, was seized with symptoms of inflammation of the bowels; after recovering from this attack, which confined her to bed for three days, she was attacked with violent dyspnœa; on the disturbance of respiration subsiding, she became restless and sleepless, and evinced symptoms of great cerebral irritation; it was feared that the case would terminate in mania, when, on a sudden, the efflorescence of scarlatina was discovered on her skin. In forty eight hours this young lady took 252 grains of the sesquicarbonate of ammonia.

Ammonia was introduced into medical practice for the treatment of scarlatina by Dr. Peart in the beginning of the present century; it was soon after adopted, on account of its unmistakable merits, by Mr. Wilkinson, and is now pressed upon the attention of the medical profession by a scholar of Mr. Wilkinson's, Dr. Charles Witt. Out of several hundred cases of scarlatina, one gentleman has lost not more than one per cent. during a period of six years. Another practitioner rarely lost a patient during a practice of twenty years; but his successor, who rejected the treatment by ammonia, lost 74 out of 106 cases during a single epidemic. In a public school, where the quinine and acid treatment prevailed, the number of deaths was rather more than ten per cent. Mr. Henry Jackson, senior surgeon to the Sheffield Infirmary, had, with his father, followed Dr. Peart's plan of treatment for upwards of fifty years, and during that period lost only four patients, who died in reality from typhus supervening on scarlatina. Mr. Wilkinson had not lost a patient from scarlatina or rubeola in twenty years. Dr. Peart himself records that after commencing the treatment by ammonia he did not lose one out of three hundred patients. His formula was a solution of two drachms of the sesquicarbonate in five ounces of water; and the dose, two drachms every two, three, or four hours, according to the urgency of the symptoms. When the difficulty of swallowing diminished, he permitted the addition of water to the dose of solution, if agreeable to the patient; and he gave it in every form and stage of the disorder. "Some were glowing with universal efflorescence; in some, the extremities were swelled; in others, fetid ulcers appeared; in most, the throat was swelled and inflamed, often ulcerated, and respiration almost prevented; but, in the most alarming cases, a scorching fever and raging delirium rendered the patient's situation horribly distressing; yet, in all these variations of the disease, the volatile alkali was my specific, which I administered to between two and three hundred patients, successively and successfully."[1]

If the extension of the disease to the kidneys should be indicated by anasarca, or the state of the urine, the warm bath must be immediately resorted to. It may be given twice a day, once a day, or every other day, according to the strength of the patient, and the relief it is found to afford; and its action may be increased by antimonial diaphoretics. An active purgative, and such as will relieve the mucous membrane by exciting secretion, at the same time that it moves the bowels copiously, must be administered. Calomel, with the compound jalap powder, saline aperients, or drachm doses of the bitartrate of potash, are the best means for this purpose. And, in addition, the action of the kidneys may be gently aided by mild diuretics, such as the citrate of potash, acetate of potash, or liquor ammoniæ acetatis. But diuretics should be used with caution; judiciously selected and administered, I am of opinion that they would relieve the most con-

[1] Dr. Charles Witt reminds us that "it has been long and generally acknowledged in those districts of England where the viper abounds, that when such poison has been infused into the system ammonia is *the* antidote."

gested condition of the kidney; but, improperly chosen and mistimed in their exhibition, there would be danger of their increasing the inflammation which they are intended to abate. When symptoms indicate a very considerable congestion of the kidneys, leeches to the loins, sinapisms, or dry cupping, may become necessary. The compound tincture of iodine, containing an additional drachm of iodine to the ounce, I have seen used as a counter-stimulant with great success and relief. It possesses the advantage of ready application, and may be used without the slightest disturbance of the patient. When symptoms denote effusion into the cranium or cavities of the brain, sinapisms or a blister should be applied to the nape of the neck.

During the progress of the above treatment for carrying off the morbid poison, the powers of the digestive organs must be maintained by a nourishing diet; and, as the symptoms subside, wine may be allowed for the same purpose. When the disease is exhausted, the general tone of the system, and especially that of the kidneys, is to be restored by means of mild chalybeate tonics, such as the citrate of iron, potassio-tartrate of iron, citrate of iron and quinine, vinum ferri, tincture of the sesquichloride, sesquioxide, or iodide of iron; or, as recommended by Dr. Robert Williams, salicine, from combining the properties of a tonic and diuretic, in five-grain doses, three times a day.

When the cause of the œdema or anasarca is an anæmic state of the system, tonic remedies are the appropriate treatment from the earliest indication of the existence of such a state; the tonics best suited to the purpose being the salts of iron, alone or in combination with a bitter infusion; or the sesquioxide of iron.

In scarlatina anginosa, the same general plan of management should be adopted as in the preceding form; and, if the heat of the skin be excessive, great relief will be afforded by sponging with cold or tepid water, vinegar and water, or tepid vinegar. The disposition to nausea which exists in scarlatina anginosa should be met by effervescing salines, such as the citrate of potash or ammonia, with hydrocyanic acid, combining with these remedies laxative doses of neutral salts. But, as the leading feature of scarlatina anginosa is inflammation of the mucous membrane of the fauces, this must be treated by the early application of nitrate of silver in the solid state. Some medical men give a preference to a strong solution, such as twenty or thirty grains to the ounce, applied by means of a sponge, but the solid stick appears to me to be most easily managed. The application should be repeated once or twice in the day.

When the tonsils are enlarged and painful, and interfere seriously with respiration, or are accompanied by severe pain in the head, leeches should be applied to the submaxillary region, the number being regulated by the age and strength of the patient. In moderately strong children ten or twelve may be employed, but the abstraction of blood must be conducted with caution. If there be delirium the head should be shaved and cold applied. Blisters to the throat are objectionable in these cases, for, by exciting inflammation

of the cutaneous surface, they act as an additional source of irritation; the tincture of iodine is not open to the same objection, and is an excellent remedy. So long as the inflammation of the fauces continues, the saline remedies must be pursued; but as soon as the sloughs are thrown off, and ulceration established, and the febrile symptoms are on the decline, tonic medicines, with mineral acids and wine, are indicated. Acid and astringent gargles or fumigations, or, in young children, aspersion of the throat, with an acid and slightly astringent solution, are often useful in procuring the removal of the viscid mucus and exuviæ which are apt to collect in the fauces and excite nausea. They also serve to remove the fetor which accompanies the sloughing and ulceration.

Emetics have been recommended very strongly, as a means of clearing the throat of its mucus, and, at the same time, of ridding the stomach of its peccant contents. The violence of the remedy sometimes outweighs the inconvenience which it is proposed to remove, and, although supported by the authority of Withering, emetics have fallen into discredit.

Purgatives, like emetics, have been much overrated in the treatment of scarlatina anginosa. Willan was an advocate for the employment of calomel in purgative doses, with a view to reduce the febrile excitement and heat of surface. Dr. Hamilton also drew a favorable deduction from their use; but Dr. Robert Williams has shown that while the mortality in the cases treated by Dr. Hamilton was twelve in ninety-five, in those treated by moderate stimulants it was only three per cent.

Dr. Currie, of Liverpool, the celebrated advocate for the employment of cold water in fevers, pursued this practice in scarlatina with remarkable success, washing the surface whenever the skin was "hot and dry." Dr. Bateman, and several other eminent physicians, adopted the practice of cold affusion, and gave the strongest evidence in its favor. The method of using the remedy is, to pour one or two pailfuls of cold water over the patient, to rub him quickly dry, and place him in bed, where in a short space of time he falls asleep, and generally breaks out into a moderate perspiration. If the feeling of cold should continue after the bath, a little warm wine and water is administered. The effect of cold affusion is, to diminish the frequency of the pulse, to reduce the thirst and heat of skin, and to tranquillize the nervous system. If needful, it may be repeated a second or a third time. When affusion is not thought advisable, sponging the surface with cold water may be employed as a substitute. "Cold affusion," says Bateman, "combines in itself all the medicinal properties which are indicated in this state of disease, and which we should scarcely, *à priori*, expect it to possess; for it is not only the most effectual febrifuge, but it is, in fact, the only sudorific and anodyne which will not disappoint the expectation of the practitioner under these circumstances." "Invariably, in the course of a few minutes, the pulse has been diminished in frequency, the thirst has abated, the tongue has become moist, a general free perspiration has broken forth, the skin has become soft and cool, and the eyes have brightened,

and these indications of relief have been speedily followed by a calm and refreshing sleep."

Dr. Schneemann, of Hanover, speaks in high terms of eulogium of a very simple treatment, namely, inunction with lard.[1] He says: From the first day of the illness, and as soon as we are certain of its nature, the patient must be rubbed every morning and evening over the whole body with a piece of bacon, in such a manner that a covering is everywhere applied. In order to make this rubbing-in somewhat easier, it is best to take a piece of bacon the size of the hand, choosing a part still armed with the rind, that we may have a firmer grasp. On the soft side of this piece slits are to be made in various directions, in order to allow the oozing of the fat; and this is still further promoted by placing the bacon, for some time previously to using it, near the stove, in the oven, or on the hob, but the fat must be allowed to cool before its application.

The rubbing must be most conscientiously performed, and not too quickly, in order that the skin may be thoroughly saturated; and during the process only that part of the skin subjected to the operation should be exposed. This treatment should be continued night and morning for three weeks, and once a day for the fourth. After that, the patient may be washed daily with cool water and soap, and not until the skin has become accustomed to the cool ablution should the warm bath be commenced.

The advantages of this plan Dr. Schneemann states to be the shortening of the disease to such an extent, that the patient may leave the house at the end of ten days; the checking of all infection by the end of the third or fourth day; the relief of all uneasy and painful feelings in the skin, particularly those that accompany desquamation; the diminution of the amount of desquamation; the prevention of taking cold; and a greater security against complications and sequelæ. The treatment, he observes, is not likely to find much favor with the fastidious, on account of being dirty, but the first few days of its application produce results which make all this to be forgotten, and inspire mothers with enthusiasm. With a rapidity bordering on magic, all, even the most painful, symptoms of the disease are allayed; quiet, sleep, appetite, and good humor return, and there remains only impatience to quit the sick-room.

Dr. Mauthner,[2] of Vienna, adds his testimony in favor of the remedy; and from my knowledge of the value of inunction in erysipelas, I am disposed to think most favorably of it. The principle of its action I believe to be the prevention of the too rapid oxygenization of the blood at the surface of the body, and the consequent check to inflammation and its processes in the skin, one of the most important of those processes in diseases depending upon an animal poison being an augmentation of that poison. My friend, Mr. Grantham, of Crayford, in Kent, has for many years past relied on

[1] On Scarlet Fever, by Dr. Schneemann, translated by John L. Milton, M.R.C.S.E., Lancet, September 15, 1849.

[2] Revue Médico-Chirurgicale, 1849.

inunction in the treatment of violent sprains, and, at his recommendation, I have pursued the plan with extraordinary success; the principle is the same, and falls into the same category as mercurial inunction in small-pox.

Belladonna has obtained a high reputation among Continental practitioners for its protective and curative powers in scarlatina. It was first suggested in 1807 by Hahnemann, who had observed that all persons to whom this medicine had been given were preserved against the infection of scarlet fever. Several German physicians, who have recorded their experience in *Hufeland's Journal*, unite in praise of belladonna; one gentleman remarks that during an epidemic of scarlatina, fourteen children out of 195 exposed to the contagion, alone took the disease, and those were but slightly affected; another expresses his opinion, that belladonna may be considered as being as successful against scarlatina as vaccinia against small-pox. Several repeat the observation of Hahnemann, that the medicine produces an efflorescence on the skin similar to that of measles; children in whom this efflorescence appears are at once regarded as safe. The reporters exhibit some disagreement in reference to the strength of the remedy: one recommends a solution of three grains of the extract to an ounce of cinnamon-water; and of this solution he gives two or three drops to infants under a year, three or four drops during the second year, increasing the dose progressively until twelve years, at and after which period he administers twelve drops: another makes a solution of one grain to a drachm of water, and states the dose at ten to twenty drops, meaning, I apprehend, for an adult. Both these gentlemen prescribe the remedy twice a day; while a third thinks it desirable to administer it four or five times a day, of course in corresponding doses. Dr. Schneemann, the originator of the inunction treatment, proposes a solution of two grains of the extract in an ounce of cinnamon-water, and recommends, as the proper dose, as many drops, morning and night, as the child has years. The remedy should be continued, he observes, for at least fourteen days.

Belladonna may also be given with advantage after the attack and during the progress of the fever, in doses of half a grain to two or three grains, according to the age of the patient, every three or four hours.

Both cold affusion and belladonna appear to me to act therapeutically, by virtue of their sedative effects upon the nervous system; and upon the same principle, any sedative means, from which the stimulant property were as much as possible excluded, would insure the same desirable end. Cold affusion has been used with great advantage in fevers, and the sedative powers of opium have lately been employed in France for the purpose of checking the inflammatory action.

Dr. Sims remarks, in relation to prophylactic treatment: "The best preventive to the disease I found to be rhubarb, taken in the quantity of a few grains every morning, so as to produce one laxative motion in the day. I did not see one who used this confined afterwards to bed, though several persons began it after they were infected, but before the time of their sickening."

Scarlatina maligna.—The vast depression of the powers of the nervous system that exists in scarlatina maligna indicates a tonic plan of treatment, conjoined with a proper regulation of the digestive system by means of gentle laxatives; and attention to the local disorder of the throat. The best tonic remedies are quinine with infusion of roses and dilute sulphuric acid, gentian with nitric and hydrochloric acids, cascarilla, hops, or canella. The tonic and nutritive properties of wine or good beer render them invaluable remedies in these cases; the quantity which may be taken daily by a child is from one to three ounces, and by an adult, double that quantity. The application of leeches to the throat is contra-indicated in the malignant form of scarlatina, and, indeed, no symptoms present themselves to warrant their use. The same objections oppose the application of blisters and counter-irritants. The fauces should be fumigated with the steam of warm vinegar, with decoctions of contrayerva and bark, acidulated with acetic acid, or containing camphorated spirit; or gargled with a weak solution of chloride of lime or capsicum pods. Dr. Watson remarks, that a great improvement upon the old plan of capsicum gargles, is a weak solution of common salt either used as a gargle, or, if the disease occur "in a child that is not able to gargle, this solution may be injected into the nostrils and against the fauces by means of a syringe or elastic bottle. The effect of this application is sometimes most encouraging. A quantity of offensive sloughy matter is brought away; the acrid discharge is rendered harmless; the running from the nose and diarrhœa cease; and the disease is converted into a form which approximates to the scarlatina anginosa." The surface of the body may be sponged with warm vinegar, but the use of cold water, so agreeable and beneficial in scarlatina anginosa, is painful and injurious in the malignant form.

"Of late," observes Dr. Watson, "I have been in the habit of directing a solution of the chlorate of potash in water (a drachm to a pint) as a *drink* for patients in scarlet fever, and in the typhoid forms of continued fever. This practice was suggested to me by Dr. Hunt, who tells me he has long employed it with advantage. Under the use of a pint or a pint and a half of this solution daily, I have remarked in many instances a speedy improvement of the tongue, which, from being furred, or brown and dry, has become cleaner and moist." Dr. Watson also remarks that the solution of chlorine has been strongly pressed on his attention as a praiseworthy remedy. "Two drachms of the chlorate of potash are to be dissolved in two ounces of hydrochloric acid previously diluted with two ounces of distilled water. The solution must be put immediately in a stoppered bottle and kept in a dark place. Two drachms of this solution mixed with a pint of distilled water, constitute the chlorine mixture, of which a tablespoonful or two, according to the age of the patient, may be given for a dose, frequently."

Scarlatina sine exanthemate will require the treatment adapted for scarlatina anginosa or scarlatina maligna, according as it may put on the characters of either of the preceding forms. With the view of

encouraging the development of the eruption, the skin should be stimulated by the hot air bath, warm bath, or mustard bath, by frictions with irritating applications, and by blisters.

The *retrocession* of the cutaneous efflorescence in scarlatina should be treated with mustard baths, the application of blisters, and the friction of stimulating liniments on the skin. An eruption, evincing a disposition to metastasis, may frequently be fixed by means of a blister.

Complications of scarlatina.—The complications of scarlatina call for a treatment especially directed to the organs affected. Thus, when, from the presence of delirium and comatose symptoms, without much inflammation of the fauces, we are led to infer congestion of the brain, leeches should be applied to the temples or to the mucous membrane of the nose, in imitation of the critical hemorrhage which frequently occurs at the close of the disorder, and blisters should be placed behind the ears, or upon the nape of the neck. But when the symptoms are associated with inflammation of the fauces, the most ready, and indeed the only method of relieving them is to apply the leeches to the sub-maxillary region. It must, however, be borne in mind, that the delirium of scarlatina is very frequently an indication merely of irritation of the nervous system, and not of congestion; in which case the treatment must consist of opiates instead of depletory remedies. When respiration is obstructed from congestion or œdema of the mucous membrane of the larynx or trachea, leeches should be applied over this region, and in very severe cases, it may be necessary to perform tracheotomy. When the lungs or pleuræ are affected, leeches to the chest, with blisters or sinapisms, are required. When the stomach appears to be the seat of congestion, leeches to the epigastrium, and a blister or sinapism, will facilitate its restoration. Diarrhœa is to be relieved by leeches or fomentations to the abdomen, succeeded by sinapisms or a blister; and the same plan is requisite when the kidneys are the organs especially disordered, the therapeutic management in the whole of these cases being aided by mustard foot-baths. The cure of ulcerations in the fauces is best effected by means of a solution of nitrate of silver applied with a sponge; or by the same salt in powder blown upon the ulcerated surfaces through a quill.

The inflammation of the joints that so frequently succeeds scarlatina, is combated by means of gentle purgatives, some simple sedative to relieve pain, and fomentations to the diseased articulations. Other sequelæ should be treated according to the general principles of therapeutics.

VARIOLA.

Syn. *Small-pox. Variole; Petite vérole*, Fran. *Kinderpocken, Kinderblattern*, Germ.

Variola is an acute inflammation of the tegumentary investment of the entire body, both cutaneous and mucous, associated with fever of an infectious and contagious kind. On the skin it is characterized by an eruption of red points, which pass through certain stages of pro-

gressive development, becoming, in quick succession, pimples (vari), acuminated vesicles, flattened and umbilicated vesicles, pustules, and hard brown scabs; the latter falling off from the eleventh to the twenty-fifth day, and leaving behind them small, irregular pits, and permanent cicatrices. On the mucous membranes it produces great congestion of surface, and in some situations pustules, particularly in the respiratory passages. The fever of variola is of the remittent type, preceding the eruption for two, three, or four days, ceasing as soon as the eruption is developed, and returning when the eruption has reached its height, namely, on the eighth day in discrete, and on the eleventh day in confluent, small-pox.

Small-pox admits of several divisions in relation to the origin, distribution, and degree of severity of the disease. In respect of origin it may occur sporadically, or be the consequence of the voluntary introduction of the variolous virus into the system, constituting the two varieties termed *natural small-pox* and *inoculated small-pox*. In reference to distribution and degree the eruption of small-pox may be *discrete*, the pustules being distinct, and scattered over the surface of the body; it may be *coherent*, the pustules being very numerous, and, in many situations, placed closely side by side, but still distinct; it may be *confluent*, the pustules being very numerous, and, in several situations so closely set as to run one into the other, and form confluent clusters of various size; or it may be *modified*, the pustules being altered in their number, their size, and their course, either by the previous invasion of small-pox, natural or inoculated, or by vaccination. Modified small-pox is a much milder affection than the parent variola, and is termed varicella or varioloid. Another division of variola relates to its occurrence for the first time, or as a second attack, a distinction which is expressed by the terms *primary* small-pox and *secondary* small-pox. Besides the preceding, we sometimes have occasion to remark, during the prevalence of an epidemic of variola, the occurrence of the fever of small-pox without its eruption; this variolous fever constitutes a variety which has been appropriately termed *variola sine variolis*. These terms, expressive of differences in the character of variola, are chiefly useful for the purposes of communication and description. They may be comprehended at a glance, by placing them in a tabular form, thus:

Natural variola—Discrete,
Coherent,
Confluent,
Modified,
Secondary.
Inoculated variola.
Variola sine variolis.

The course of variola admits of consideration in five successive periods, this division being alike convenient in the treatment and description of the disease. The periods of variola are those of incubation, invasion, eruption, suppuration, and desiccation.

I. The *period of incubation* is of variable duration, and comprehends all that space of time which intervenes between the exposure of the

body to infection or contagion, and the invasion of the disease. In very severe cases the period of incubation is short; in the milder forms, on the contrary, it is long. The limits commonly assigned to this period are from five or six to twenty days, and cases sometimes occur in which it would seem to be still further prolonged.

II. The *period of invasion* is marked by symptoms which indicate serious constitutional disturbance. It commences with languor and lassitude, with shivering and horripilation, pains in the head, in the loins,[1] and in the limbs: the skin is hot, and either dry or moist; the conjunctivæ suffused; the pulse and respiration quickened; there is thirst and loss of appetite, with a white and coated tongue, dotted with red papillæ; nausea, often vomiting, constipation, pain and heat at the epigastrium, restlessness, and universal prostration. To these succeed, though various in degree in different individuals, oppression of breathing, cough, lethargy, and sometimes coma. The tongue, at the commencement of this period, usually white, soon becomes red at the point, and subsequently over its entire surface. In children, convulsions not unfrequently ensue at this stage of the febrile symptoms. Throughout all the periods there is exacerbation of the febrile symptoms during the night.

In confluent small-pox the symptoms of invasion attain their highest degree of severity, there is more sickness and vomiting, the prostration of the system is greater than in the discrete variety; the tongue and lips are parched, and covered with sordes; the heat of skin is excessive; convulsions are more frequent, and sometimes there is diarrhœa.

The period of invasion lasts from two to four days, and its symptoms are instantly relieved by the succession of the eruptive period.

III. The *period of eruption* is often ushered in by a manifest exacerbation of the constitutional symptoms, which are at once and immediately relieved by the outburst of the eruption; the oppression and languor are no longer felt, the nausea and sickness cease, the pulse returns to the natural standard, and is full and regular. The eruption first appears upon the lips and forehead, and then upon the rest of the face; from the face it proceeds to the neck and arms; from the latter to the trunk, and from the trunk to the lower extremities, the entire body being pervaded in the brief space of twenty-four hours.

The development of the eruption is indicated by the appearance of small red points,[2] conical in their form, and hard to the touch, which are disseminated over the surface in numbers proportionate to the subsequent pustules. Thus, in the discrete variety, the spots are few and distinct; in the coherent kind, they are numerous and clustered (corymbose), like the patches of rubeola; while, in confluent variola,

[1] M. Chomel regards the pain in the loins, which he refers to the kidneys, as pathognomonic. Dr. Heberden observed, that acute pain in the loins was generally followed by a severe attack of the disease; when the pain was higher in the back, the disorder was milder; and the most desirable indication was the absence of pain. Mr. Marson, of the London Small-pox Hospital, considers the pain in the loins to result from the passage of the variolous poison through the vessels of the kidney, thus exciting a painful state of the nerves of that organ.

[2] By some writers these points have been compared to the spots produced by the bite of the flea.

they are closely aggregated, and so abundant as to diffuse a general redness over the surface. The skin is hot, tense, and shining. The red spots soon become raised, and by the second day of eruption (fourth or fifth of invasion) have the appearance of small conical papulæ (vari), with red and inflamed bases, and transparent and vesicular points. On the third, fourth, and fifth day of eruption (fifth to ninth of invasion), the papular elevations, with their inflamed bases, go on progressively enlarging, the vesicles pass from a conical into a depressed and indented or umbilicated form; their contents, which were at first a transparent lymph, become whitish and milky, and a thin layer of white coagulum is formed on the derma. The umbilicated character is apparent in many of the vesicles on the third day of the eruption, and by the fourth or fifth, a distinct areola is apparent around each.

Similar phenomena may be observed to be taking place at the same time in the mouth and pharynx; the mucous membrane is red, swollen, and congested; there is soreness of the throat, and painful deglutition; the respiration is somewhat impeded in consequence of the extension of the inflammation to the larynx and trachea; the voice is hoarse and weak; and there is frequently a hard, dry, and troublesome cough. The eruption is developed in the larynx and trachea, on the pharynx and fauces, and on the tongue, in the form of white points, which become converted, first into vesicles, then into pustules.

In the confluent variety the remission of febrile symptoms is imperfect, the eruption appears a day earlier than in the discrete form, the papulæ are less raised, but so numerous as to give rise to a general swelling of the skin, which is of a deep red color, shining and granulated. The incipient pustules constitute one continuous vesicle over the inflamed surface, formed by the effusion of liquor sanguinis or coagulable lymph beneath the epidermis. This fluid, at first transparent and limpid, becomes milky and opaque, and a thin whitish pellicle of false membrane is deposited on the derma, and may be seen through the raised epidermis.

The confluent and the discrete variety of small-pox frequently occur together in the same individual, the eruption being confluent on the face,[1] and discrete on the rest of the body. When the confluent form extends to the mouth and pharynx, the mucous membrane is covered with pustules, deglutition is rendered exceedingly painful, and respiration is seriously impeded. In the trachea the eruption gives rise to cough, and in the nasal passages to sneezing and catarrh. On the eyelids the pustules produce great tumefaction and severe inflammation of the conjunctiva.

The eruptive period occupies five days: one corresponding with the varous stage, and the four following with the vesicular stage.

[1] The eruption is always most confluent on those parts of the body where some external source of irritation is added to that of the disease. Hence the eruption is most abundant on the face, hands, buttocks, and inner sides of the thighs of children. Sydenham remarks, that if there be 10,000 pustules on the entire body, 2000 of these will occupy the face.

IV. The *period of suppuration or maturation* commences on the sixth day of eruption (ninth or tenth of invasion), by augmentation of the contents of the vesicles, and conversion of their contained lymph into pus. As a consequence of this change, the vesicles lose their umbilicated character; they become spheroidal and flattened, and their whitish appearance gives place to a tint of yellow of increasing depth. Maturation is complete on the eighth day of eruption. On the eighth day, also, the secondary fever is developed, and continues until the eleventh, during which time the pustules burst, and give exit to a portion of their contents; the period of desiccation is then established.

In the confluent variety, the inflammation, instead of being confined to a number of distinct points, is distributed over a large surface; isolated pustules, consequently, are not formed, but the production of pus occupies a district of considerable extent. On the face, the raised epidermis frequently begins to desiccate into a thin yellowish crust before the formation of pus is completed; the pus in this case is effused beneath the crust, giving to it additional thickness, and a characteristic brownish hue.

Suppuration is first perceived on the face, whence it extends to the rest of the body, showing a disposition to affect those parts first which possess the thinnest and most delicate skin. For this reason it is that the feet and hands are the parts last observed to undergo the suppurative change. The completion of the suppurative stage on the eighth day of eruption, is attended with considerable pain and throbbing, with a vivid redness of the skin, great tumefaction, and a distressing sensation of tension of the integument. The swelling affects, in the first instance, the head and face, from these it extends to the trunk and limbs, and from the latter to the hands and feet. The eyelids are often so much swollen as completely to bury the eyes; the nose and lips are much enlarged; there is swelling and congestion of the mucous membrane of the mouth, and (in the adult) profuse salivation; the lining membrane of the alimentary canal sympathizes in the general irritation of the mucous surfaces, as may be inferred from the presence of diarrhœa. And the nervous system is greatly depressed, as is shown by the listlessness and lethargy which are conspicuous at this period.

With this extreme of local disorder, the *secondary fever* is established, and continues unabated until the close of the eleventh day of eruption. In mild cases this stage is accompanied with moderate delirium. But in more severe cases the tongue becomes brown, the symptoms assume the low typhoid type, there is hard cough, with hæmoptysis, and sometimes hæmaturia.

In confluent small-pox the secondary fever is not developed until the eleventh day; the symptoms are severe, and often accompanied by restlessness, which increases towards night. This state of restlessness is a dangerous symptom.

V. The *period of desiccation* is indicated by subsidence of tumefaction of the skin, by the drying up of the pus and purulent discharge produced during the preceding period, and by the conversion of these

fluids into scabs of various thickness. Desiccation commences on the face much earlier (eighth day of eruption) than on the rest of the body, and it not unfrequently happens that crusts are present in this region before the pustules have attained maturity on the limbs. The crusts are formed in two ways, either by rupture of the pustules and desiccation of the purulent discharge which is poured out by the exposed and ulcerated surface, or by desiccation of the entire pustule with its investing epidermis. The former is the more frequent method of their production. When the crusts fall, an event that occurs upon successive parts of the body, from the eleventh to the fourteenth day of eruption, the skin beneath is of a bright red color, retaining this hue for several weeks, and the newly-formed epidermis is thrown off by repeated desquamation. The cicatrices also which have been produced by the ulcerations now become apparent.

In the confluent variety, as has been already remarked, the crust on the face commences to be formed before the completion of the suppurative process, often as early as the eighth or ninth day of the eruption. This extensive crust forms a complete mask to the features, and remains attached for ten or twelve days. When it falls off, the skin beneath presents a vivid red color, and desquamates freely, bringing into view a surface too frequently disfigured with deep pits, and seamed with extensive cicatrices. The crusts of confluent small-pox are softened with the fluids poured out by the inflamed skin, and their fall is not completed till the twentieth or twenty-fifth day.

The desiccation of the pustules of small-pox is attended with severe itching, which induces the patient to scratch, and often to tear the surface with his nails. By this proceeding hemorrhage takes place from the ulcerated surface, and the drying of the blood gives rise to a black discoloration of the scabs which form over the wounded parts. The desiccation of the pus and of the purulent discharges is attended with a nauseous and offensive odor.

It is remarked by Simon, that the urinary secretion in variola undergoes changes having relation to the various stages of the disease. That, in the beginning, when the fever assumes the character of synocha, the urine is diminished in quantity, and increased in specific gravity; its color is deep and red; it is frequently turbid, and often contains a small quantity of albumen. In the eruptive stage, as ascertained by Becquerel, in five cases, in which the symptoms were severe, "the urinary secretion was diminished, and amounted on an average to only 23.5 ounces in twenty-four hours. The specific gravity had not, however, increased so much as might have been supposed, being only 1020.6. It frequently threw down uric acid precipitates, either spontaneously, or on the addition of nitric acid, and in one case a little albumen was observed." "According to Schönlein, in the first stage of variola, it is of a reddish-brown tint; on the third or fourth day a sweat of a peculiar and strong odor is observed, and the urine contains a turbid, apparently purulent mucous sediment, of an unpleasant odor."

"During the suppurative stage of variola, Becquerel observed that the urine retained the synochal character as long as the symptoms

continued." And in cases in which this fever persisted until death, the state of the urine also remained the same. Sediments and frequently purulent mucus occur in the urine of this period.

"During the period of desquamation the urine is either normal or anæmic."

In the nervous form of variola the urine is very changeable, and often dark. "In the putrid form the urine appears decomposed, ammoniacal, and not unfrequently of a dark red color, from the presence of hæmatin."[1]

INOCULATED VARIOLA.

The intent of the operation of inoculation is to bring some portion of the fluid contained within the small-pox vesicle into relation, either with the papillary surface of the derma, or with the tissues situated immediately beneath the epidermis of a sound person. When this object has been effected, the inoculated particles dissolved in the fluids of the tissues are conveyed by imbibition into the system, and communicate to the whole mass of the blood a disposition to the production of matter of a similar kind.

The local signs indicating that the inoculation has taken effect are first perceived on the third day from the operation, when a slight blush of redness is seen around the puncture; this is accompanied by a trifling degree of itching, and the skin feels hard and dense when touched with the finger. On the fourth and the fifth day these signs continue gradually to increase; there is a sensation of prickling and tingling in the inoculated spot, and a small elevation begins to be formed in the centre of the areola. On the sixth day an incipient pustule is produced by the effusion of liquor sanguinis beneath the epidermis, the vesicle at this period begins to be depressed at its centre, and to assume the umbilicated appearance. On the seventh day there is tenderness of the integument around the vesicle, and some degreee of pain on moving the arm; the vesicle begins to look whitish and opaque; the contained lymph quickly gives way to the formation of pus, and the vesicle is surrounded by a purplish areola. By the ninth or the tenth day the pustule has lost its umbilicated character, and has attained its perfect development. After the completion of the pustule the areola declines in redness, and its contents desiccate, the desiccation taking place during the period intervening between the twelfth and the fifteenth day, and forming a scab of a deep brown color, and considerable thickness. The crust is thrown off during the period ranging from the twentieth to the twenty-fifth day, and is succeeded by a strongly marked cicatrix, which remains apparent for the rest of life.

The period of invasion of the constitutional symptoms in inoculated small-pox usually commences on the ninth day. They resemble in character those of sporadic variola, but are mild, and sometimes so slight as to be scarcely recognizable. Instances are occasionally met with in which the symptoms of invasion are developed, and followed

[1] Simon, vol. ii. p. 282.

by eruption, without any signs of inflammation in the inoculated part, and consequently without the formation of a pustule.

The period of eruption in inoculated small-pox is irregular, the eruption appearing generally on the second or third day from invasion, or on the eleventh or twelfth from inoculation. Occasionally it is observed at the end of a week after inoculation, and sometimes is protracted to a fortnight. The eruption is ordinarily very slight, sometimes failing altogether, or being scarcely perceptible; while, in rare instances, it may occur at several successive periods, or the confluent variety of eruption be developed.

The eruptive period of inoculated small-pox is sometimes complicated with an erythematous inflammation of the skin, constituting variolous roseola.

VARIOLA SINE VARIOLIS.

This form of variola is rare; it has, however, been occasionally observed during the prevalence of an epidemic of variola, and is characterized by the presence of the constitutional symptoms and mucous inflammation of that disease without the cutaneous eruption. Sydenham assigned to this affection the name of variolous fever, and the accuracy of his observations has been confirmed by subsequent writers. Rayer remarks that he has never seen an instance of this variety of small-pox.

COMPLICATIONS OF VARIOLA.

Hitherto the favorable course only of variola has been described, but the disease is not unfrequently attended with *complications*, which give it the character of a dangerous and often fatal disorder. These complications may occur during any one of the five periods into which the progress of the affection has been divided.

Instead of pursuing the milder course above indicated, the period of invasion is occasionally marked by symptoms of excessive severity, the accompanying fever runs high, the rigor which precedes it has been long and enduring, and the pains in the head, the chest, the præcordia, and the loins, are so violent as to lead to the suspicion of inflammation of organs situated in those regions. There is sometimes delirium and coma, at other times convulsions; and death may occur before the eruptive stage is established. In cachectic states of the system the period of invasion is sometimes complicated with passive hemorrhages from the mucous membranes and from any trifling wound of the skin, and by petechiæ in the tissues of both structures.

The period of eruption, like the preceding, is liable to its accidents; instead of the favorable course already noted, serious congestions of one or more of the internal viscera may ensue. Sometimes the congestion is directed upon the brain and spinal cord, producing twitching of the muscles, restlessness, convulsions, or coma; sometimes on the lungs, causing bronchitis, pneumonia, or pleurisy; sometimes on the mucous membrane of the alimentary canal, giving rise to diarrhœa, dysentery, or hemorrhage; and sometimes upon other of the abdo-

minal organs. In the cachectic diathesis, passive hemorrhages and petechiæ may accompany this period; and under any of the above complications, the case may prove fatal before the completion of the eruption. The eruptive process is liable to suffer seriously by these complications; thus, the variolous vesicles, instead of progressing, become stationary and flaccid, or distended with a sanguinolent and serous fluid.

The period of suppuration, as it is the most severe in its symptoms, is also the most dangerous in its complications, and the most frequently fatal in its results. Alarming symptoms sometimes appear with astonishing rapidity, and destroy life in a few hours, or even in a shorter period. Affections of the brain, of the larynx, and of the trachea, are most to be apprehended during this period. When these secondary affections are severe, the pustules remain stationary, or become flaccid, or are converted into sanguinolent bullæ; sometimes they are accompanied with petechiæ and passive hemorrhages, and in rare cases disappear by the absorption of their purulent contents. The latter occurrence is always fatal. Other dangerous indications of this period are, the absence of tumefaction and redness of the skin, the absence of salivation, the appearance of the brown tongue of typhus, restlessness and anxiety, mortification of any part of the skin, &c.

The termination of variola is a period of much anxiety; for when the disorder has run favorably through its stages, and the danger of the disease has apparently passed away, secondary affections are not uncommonly developed, as consequences of the variolous inflammation. Such are, chronic inflammation of the various mucous membranes, producing deafness, ophthalmia, opacity of the cornea, staphyloma, œdema glottidis, hæmoptysis, pulmonary tubercles, chronic bronchitis, pneumonia, pleuritis, empyema, chronic diarrhœa, &c., glandular enlargement, caries of the bones of the face, subcutaneous abscesses, furuncles, erysipelas, gangrene of the skin, disease of joints, menorrhagia, miscarriage, hæmaturia, abscess of the kidney, and numerous other sequelæ. The cause of these various complications must be referred to some peculiarity of constitution, and cannot be explained by ordinary circumstances. Sometimes they would appear to depend on the vicissitudes of season, the depth of winter and the height of summer being most frequently attended by adverse consequences.

Variola is occasionally complicated with rubeola and scarlatina, and sometimes with petechiæ. The latter form of small-pox is very severe in its affection of the mucous membranes and viscera, but the cerebral symptoms assume a milder type.

Pathology.—On examination after death of those who have fallen victims to small-pox, several of the internal organs are found to present traces of congestion, particularly the brain, the lungs, and the surface of the gastro-intestinal mucous membrane. The tissue of the lungs is generally found congested and infiltrated, and the serous coat of the bloodvessels stained of a deep red color. Pustules are discovered upon the mucous membrane only when the patient chances to perish at the commencement of the suppurative stage. At a later

period they are usually lost, on account of the early rupture of the epithelium, which from its thinness and softness, is less resistant than the horny epidermis. For the same reason, pustules on the mucous membranes never attain a size equal to those of the cutaneous surface, and rarely contain pus. When ruptured, the surfaces occupied by these pustules are found to be covered with loose laminæ, and shreds of false membrane.

The situations in which pustules have been observed on mucous surfaces are, the extremities of the alimentary canal, where the epithelium is thick, namely, in the mouth, pharynx, œsophagus, and rectum; Rostan detected them throughout the entire intestinal canal, on the respiratory mucous membrane, namely, in the larynx, trachea, and bronchi, and in the urinary bladder.

The form of the pustule of small-pox is strikingly modified in reference to the seat of its development. Thus, on the face, where the pustules advance very rapidly to maturity, they are flat and non-umbilicated. On the palms of the hands, and on the palmar surface of the fingers, they rise gradually from the surface, are but little raised above the level of the surrounding skin, and are also non-umbilicated. On the soles of the feet, again, they are large in extent, and still more flat than the preceding, appearing like purplish disks with a white margin, and non-umbilicated. Usually, the umbilicated centre presents a reddish or brownish tint, and sometimes, though rarely, is perforated by the shaft of a hair.

When a well-formed and mature pustule is examined by dissection, it is found to be divided in its interior by a transverse septum into two chambers, both containing pus. The upper chamber is the larger of the two, and they communicate with each other, to a greater or less extent, by the rupture of the transverse septum around its marginal border. The epidermis, forming the superficial boundary of the pustule is the segment of a sphere, and continuous by its circumference with the cuticle covering the adjoining skin. The transverse septum is a layer of false membrane, of a whitish color, which was deposited on the derma at an early stage of the pustule. Subsequently this layer becomes separated from the derma, and raised by the formation of pus beneath it, and at the same time it is broken around its edges, and permits the pus of the deeper cavity to communicate with that already contained in the superficial chamber. In consequence of the peculiarity in the mode of its production, this layer of false membrane generally retains permanently the umbilicated form of the primitive pustule, and is thinner at the centre than towards its circumference. When the septum is removed, the deep chamber is brought into view, and the depressed and sometimes ulcerated base of the pock exposed. The surface of the base is of a bright or purplish-red color, and highly vascular.

Some difference of opinion subsists with regard to the cause of the umbilicated appearance of the pustule of variola during its early stages. Dr. Heming many years since attributed it to the perforation of the pustule by the efferent duct of a sebiparous gland. Velpeau, who believes that the principal seat of small-pox is the follicles of the

derma, would, I suppose, entertain the same opinion. Other writers believe it to be produced by the pores of the skin, and Rayer refers it to the attachment of the false membrane. I agree with Velpeau that the follicles of the skin are the primary seat of the vascular congestion, that this congestion gives rise to the production of the papules or vari, and consequently that the epidermal sheath of the follicle is the probable cause of the umbilication of the small-pox vesicle. When the vesicle is examined at its height of development, it is found to be multilocular in structure, and, when divided by a transverse section, exhibits an appearance which Gendrin has compared to a spice-box, while Bousquet likens it to a severed orange.

Diagnosis.—The precursory symptoms of small-pox are liable to be mistaken for simple fever, or inflammation of such of the viscera as may chance to be most affected. Pains in the loins, according to Chomel, are pathognomonic; vomiting is more usual, and the pains in the limbs are somewhat greater than in other exanthemata, and convulsions in children are more frequent. The prevalence of an epidemic of this disease, or the previous exposure of the individual to the influence of contagion, are alone calculated to raise suspicion in the mind of the practitioner until the true nature of the symptoms is confessed by the appearance of the eruption. When first developed the eruption presents considerable resemblance to rubeola, but from the latter it may be distinguished, as well by the nature of the previous symptoms as by the more decidedly papular character of the eruption, and the rough sensation which the papulæ communicate to the finger. It is utterly impossible to confound the mature pustules of small-pox with any of the pustular affections of the skin.

Causes.—It is affirmed by Mr. Moore, in his *History of Small-pox*, that this disease existed in China and Hindostan more than 1000 years before the birth of Christ. After a long period it appears to have made its way into Arabia, and to have shown itself in the Arab host at the siege of Mecca, in the year of the birth of Mahomet, 569. Pursuing the track of armies we find it raging in Egypt in 640, and subsequently following the victories of the Saracens in the eighth century, through Italy, Spain, and France. By the Saracens the disease was communicated to the Crusaders, and the latter caused its rapid spread throughout Europe. "There was no small-pox in the new world before its discovery by Columbus in 1492. In 1517, the disease was imported into St. Domingo. Three years later, in one of the Spanish expeditions from Cuba to Mexico, a negro, covered with the pustules of small-pox, was landed on the Mexican coast. From him the disease spread with such desolation, that within a very short time, according to Robertson, three millions and a half of people were destroyed in that kingdom alone. Small-pox was introduced into Iceland in 1707, when 16,000 persons were carried off by its ravages, more than a fourth part of the whole population of the island. It reached Greenland still later; appearing there for the first time in 1733, and spreading so fatally as almost to depopulate the country."[1]

[1] Dr. Watson's Lectures, first edition, vol. ii. p. 657.

Small-pox occurs at all periods of life, from the fœtus in the womb to the last hours of senility. It is developed equally in the two sexes, in all seasons, and in all climates. It may appear as a sporadic affection, or epidemically. In the latter form its invasion is most frequently observed in the summer or the autumn season.

The cause of small-pox is a specific animal poison;[1] the period when transmission is most likely to happen being the suppurative stage, and when developed epidemically, it is propagated in the direction of prevailing winds. As a general rule, small-pox attacks but once in a lifetime, but against this rule many exceptions have been recorded. Instances have been observed, in which the disease has invaded a second, a third, and even so often as a sixth time. Sometimes the subsequent attack is as severe as the first, but usually the secondary affections are remarkable for mildness and rapidity of course.

The protective agency of an attack of variola against subsequent invasions of the disease was known at a very early period in medical history; thus, inoculation was practised in Constantinople in 1673, and the practice was subsequently introduced by Lady Montague into England, whence it extended to the Continent of Europe. The intention of inoculation is to produce an attack of the disorder, at a period when the physical powers are sound and capable of resisting its influence; moreover, it is found that the inoculated disease is always more mild than the sporadic affection. Several serious objections, however, raise themselves against inoculation, and one of these so great as to have been deemed worthy of a restrictive Act of the Legislature. The most obvious reasons that oppose themselves are, firstly, that the system is equally, perhaps more safely, protected by the milder operation of vaccination; and, secondly, that inoculation often produces a severe and dangerous disease. But the most important objection to the continuance of the practice is, that the small-pox engendered by inoculation, may be communicated to others by contagion; and, consequently, that one such case may become the source of a fatal and devastating epidemic. An instance of this kind is related in the memoirs of Maria-Theresa of Austria, who, having inoculated a number of children, the small-pox was communicated by the latter to an entire village.

Prognosis.—In the discrete form of variola, or when the eruption is slight, and its course mild, the prognosis is favorable, the disease usually terminating in from two to three weeks. In the confluent form there is considerable danger, and the disorder requires to be watched with care, for symptoms of a fatal nature are apt to show themselves suddenly and unexpectedly, and the disease is prolonged to three or four weeks. Small-pox is of unfavorable prognosis when it presents irregularities in its course; when it is complicated with much cerebro-spinal or pulmonary irritation; when the pustules contain a sanguineous fluid, or are intermingled with petechiæ; when the

[1] Several authors have imagined the cutaneous eruption of small-pox to depend upon the presence of minute animalcules; but careful observation affords no ground for this supposition.

eruption is associated with debility of system in the patient, or with signs of mental depression, as fear, &c.; when the pock does not pass regularly through its stages, or when the persons affected are plethoric, and unused to disease.

TREATMENT.—The uncomplicated form of small-pox requires the most simple plan of treatment, namely, confinement to bed, diluents, cooling regimen, cool and equable temperature, frequent change of linen, and an attention to symptoms as they arise. Meddling in variola is calculated to be as injurious as in other eruptive diseases depending for their origin on a specific poison; and it must be borne in mind, that any vascular determination to the surface, whether internal or external, will be followed by an increase in the number of pustules developed on the irritated spot. Thus an incautious purgative at the outset of the fever may induce a congestion of the mucous membrane of the alimentary canal that may terminate seriously.

The treatment of variola in its simple form is consequently expectant; very little is required of the practitioner during the fever of invasion beyond the maintenance of a cooling regimen, keeping the bowels gently open by saline purgatives, and sponging the skin with tepid water.

At the commencement of the secondary fever, the proper remedies are febrifuge salines, such as the citrate of potash, or liquor ammoniæ acetatis, or effervescent salines; and at a more advanced period, a continuance of gentle laxatives or enemata, and opiates to relieve restlessness, sleeplessness, and nervous symptoms. Should the powers of the system seem to require support, this is the period when wine and a more nourishing diet may be allowed; the effects of the wine being carefully watched.

The sesquicarbonate of ammonia treatment, so valuable in rubeola and scarlatina, is equally applicable to variola, for ammonia is, probably, as Dr. Charles Witt observes, "the only medicine yet known which appears to have any decided effect upon this terrible malady;"[1] that is as a specific remedy. The manner of administration of the ammonia should be the same as that laid down under the head of treatment of scarlatina; and the general precautions taken, and the management of the patient, should be the same. My own experience of the sesquicarbonate of ammonia fully corroborates the value of Dr. Witt's suggestion; and I feel that the adoption of this method of treatment cannot be too forcibly pressed on the attention of medical men. If it be capable of effecting only one-half of what its advocates claim in its favor, it must, of a necessity, rank among the most valuable of our remedial appliances.

[1] Dr. Charles Witt mentions a paper read at the Epidemiological Society of London, from the pen of Mr. H. C. Miles, of the Royal Artillery, Halifax, on the subject of a remedy for small-pox, used by the Indian tribes, in that portion of Canada. This remedy is an infusion of the Saracenia purpurea, a variety of the pitcher plant. A wineglassful of the infusion throws out the eruption; and the same dose repeated once or twice, after an interval of four or six hours, puts an end to it completely. During the prevalence of an epidemic a wineglassful is taken daily as a prophylactic.

If the cerebro-spinal system be much disturbed, leeches to the mucous membrane of the nose or behind the ears, with mustard foot-baths, are indicated; gargles for inflammation and dryness of the mucous membrane of the mouth and fauces; leeches to the epigastrium for pains in that region with violent vomiting; mineral acids with infusion of roses, for hemorrhages; and emollient applications to the eyelids where the conjunctivæ are painful and swollen. If the eruption be tardy in its appearance, the patient may be immersed in a warm bath, at the same time that tartarized antimony and sudorifics are administered internally. Opiates are contra-indicated in the primary fever, on account of the extreme excitability of the nervous system; in the secondary fever they are frequently useful. Sydenham recommended a small bleeding at the commencement of the secondary fever, and following it up with an opiate; but he cautions us against abstracting too much blood. The safer practice is not to bleed, and in this opinion the profession are generally agreed.

These are the remedies which are applicable to small-pox in its ordinary and uncomplicated form; but when the disease assumes any of the unfavorable characters which have been described, other measures are indicated, such as local bleedings, and counter-irritation. Local bleeding by leeches or cupping may be employed at any period of the disease, when the symptoms indicate serious congestion of viscera; the abstraction of blood must, however, be conducted with caution, lest too great debility follow its use. Counter-irritation is applicable when the removal of blood by bleeding would be inadmissible. Under the same circumstances, again, mild purgatives may be administered, when symptoms of gastro-intestinal irritation are absent. But purgatives, it must be recollected, are calculated to excite and keep up irritation of the mucous membrane, and they may frequently be very judiciously superseded by emollient injections. At the close of the eruption, the employment of gentle laxatives is indicated, and, if much debility be present, tonics should be had recourse to, and their action aided by wine and nutritious diet. When there is pain and heat of head, with delirium, which depletion from the mucous membrane of the nose and behind the ears has been unsuccessful in removing, ice may be applied to the head, or the cold water pillows recommended by the late Professor Davis for hydrocephalus, or, still better, the cold cushions of Dr. James Arnott.[1]

When the nervous system is especially affected, as in that variety termed by Dr. Gregory nervous variola, the administration of tonics is called for; and similar means must be adopted when there is evidence of a cachectic state of constitution, as in the occurrence of petechiæ, passive hemorrhages, &c. Whatever the treatment adopted, however, these cases are too frequently fatal.

Cold affusion has, at various times, been extolled by eminent practitioners, but the plan has been only sparingly adopted. Some have recommended that it should be conducted in the manner laid down for scarlatina, while others confine themselves to sponging the surface

[1] See Lancet, vol. ii. 1841–2, page 441.

of the body, or the face alone. Cold water does not appear to have the effect of causing retrocession of the pustules, but is thought to increase the congestion of the mucous membranes. My brother, Dr. Marris Wilson, has pursued the practice of sponging the surface for several years, and he assures me with the best success.

The belladonna treatment recommended for scarlatina is also applicable to small-pox. I have seen this remedy exhibited with benefit, both as a prophylactic and a curative measure.

Vaccination has been observed to possess the power of modifying variola, even when an attack of the latter has commenced. Some remarkable cases are on record in which the good effect of this remedy was apparent; and it recommends itself by its extreme simplicity. Eichhorn, who was the projector of the plan, inserted the vaccine lymph by forty or fifty incisions, immediately that the symptoms of small-pox became apparent.

As regards *local* treatment, various plans have been adopted and recommended for the purpose of bringing the pustules to a favorable issue, and preventing the deep ulcerations with their consequent cicatrices, which are apt to ensue when the eruption is left to itself. We will now proceed to consider these plans; but, before doing so, it may be necessary to premise that every precaution should be taken to prevent the rupture and laceration of the pustules by the nails of the patient, in efforts made to relieve the itching by which the desiccating process is accompanied. The face should be frequently and well bathed with an infusion of poppies, or mallow, with weak barley-water, or a weak solution of common salt, particularly in the region of the eyes, nose, and lips. The secretions from these parts should be removed as much as possible by means of a sponge wetted with these fluids, and whenever an excoriation is formed, it should be anointed with a liniment composed of equal parts of olive oil and lime-water, or dusted with starch powder. But a better means of relieving the heat and dryness of the skin, and that state which conduces to itching, is by anointing the surface plentifully with the benzoated ointment of oxide of zinc. This should be applied pretty thickly, and repeated as often as it dries up or becomes thin from wiping or rubbing. The ointment will not interfere with the escape of secretions, or with the removal of such secretions when effused on the surface; but will tend very considerably to the comfort of the patient, by keeping the inflamed skin soft and moist. Some fragments of tissue-paper pressed gently on the ointment will further contribute to the protection of the skin.

The importance of keeping the surface moist, and excluding the atmosphere, would seem to have suggested to Ferdinand Hebra, the renowned dermatologist of Vienna, the application of his apparatus for maintaining a permanent warm bath, to cases of small-pox. A butcher's apprentice, eighteen years of age, seized with confluent variola, was placed in the bath on the fifth day of invasion, and just as the eruption was in course of development; and retained there until the seventeenth day, when the crusts had fallen. Hebra expresses his satisfaction at the result of the experiment, although, during his

confinement in the bath, the patient was attacked with pleuro-pneumonia dextra, nevertheless, as far as the variola was concerned, the fever remained moderate, and the eruption passed favorably through its course. I should be sorry to prejudge this method of treatment; but I am disposed to regard it less favorably than the treatment by the sesquicarbonate of ammonia, with the local application of some material which shall form a coating to the skin, capable of excluding the air and possibly the light, and at the same time of maintaining a permanent state of moisture by retaining the evaporated fluids of the cutaneous surface.

Great benefit is derived from pursuing the practice of the Arabian physicians, namely, opening the matured pustules, gently pressing from them their contents, and removing the latter by means of a sponge moistened with plain water, or with an infusion of poppies. This plan accelerates very materially the healing of the ulcerations, and prevents the formation of deep and disfiguring cicatrices.

Various ectrotic[1] methods of arresting the development of the eruption of variola, and, consequently, of preventing the occurrence of cicatrices, have, from time to time, been suggested and employed. Nitrate of silver has been used for this purpose by Serres, Bretonneau, and Velpeau. If the apex of each conical vesicle be removed, and the pointed extremity of a stick of nitrate of silver inserted into the opened vesicle, its further progress will be instantly arrested. But this proceeding is necessarily attended with pain, and requires time for its performance. To obviate these objections, it has been proposed to paint the entire surface with a solution of nitrate of silver, containing fifteen or twenty grains to the ounce; this application to a surface of any extent has been found to be dangerous, in consequence of giving rise to a considerable increase of the febrile symptoms, while the anticipated effect of checking the progress of the eruption has only partly succeeded. Moreover, the solution forms a mask to the part upon which it is applied, beneath which the pustules advance unseen and unaltered. The nitrate of silver as an ectrotic remedy is only available, therefore, for the eruption situated upon the face and neck, and to this it must be used quite at the outbreak of the disease, namely, on the first or second day, otherwise it will be liable to failure. In summing briefly the objections to the employment of nitrate of silver, they may be stated as follows: firstly, it creates pain; secondly, it requires more time for its application than the practitioner can devote; and, thirdly, it augments the febrility and nervous exhaustion of the patient.

Another ectrotic remedy has been warmly eulogized by Dr. Midivaine,[2] of Ghent. It consists in the application of sulphur ointment, by means of slight friction, to the entire surface of the skin. This ointment should be composed of two drachms of sulphur to an ounce of lard, and used three times a day, at as early a stage as possible of the disease. The effects of the remedy, according to Dr. Midivaine, are, contraction and hardening of the papulæ, diminution of tumefaction

[1] Ἐκτιτρώσκειν, to render abortive.

[2] Bulletin de la Soc. Méd. de Gand, 1840.

of the skin, and subsidence of the gastro-intestinal irritation. The appetite of the patients quickly returns, and they are speedily restored to health.

A more important ectrotic remedy than either of the preceding is one which was made the subject of an essay,[1] read before the Parisian Medical Society, by their President, Sir Joseph Oliffe. This remedy is mercury, applied to the external surface of the body, and is one which is deserving our most attentive consideration. Mercury administered internally has long been known to possess remarkable powers in modifying the influence of variola upon the system, but it was left to modern times to prove that this agent has also the property of neutralizing the variolous virus when applied externally. I pass over the well-known and unmeaning experiment of Von Wenzel, namely, the trituration of the variolous matter with calomel, and the subsequent marvel that the virus should have lost its inoculating power, to the more rational experiments of Serres, afterwards so successfully pursued by Briquet. The mercury was employed by these gentlemen in the form of a plaster, the emplastrum vigo cum mercurio, of which the formula in the French pharmacopœia is as follows:

℞.—Mercury,	95 parts.	
Balsam of storax,	48	
Common plaster,	312	
Wax, resin, turpentine, ana,	16	
Gum ammoniac, bdellium, olibanum, and myrrh, ana,	5	
Saffron,	3	
Spirit of Lavender,	2	M.

In the first experiment, a strip of this plaster was placed on the arm of a patient attacked with variola, while a similar strip of diachylon plaster was applied to the opposite arm. Under the mercurial plaster the development of the eruption was arrested; under the other plaster no modification took place. In a second case, the face of the patient was "covered with the plaster, a part of which he tore off during the night which followed its application. The denuded surface was the seat of suppurating pustules, whilst on that portion of the visage which continued subjacent to the plaster, their abortion was effected." In a third case, a man affected with "violent confluent variola, the pimples were small, scarcely raised above the level of the epidermis, and surrounded with a brilliant red areola. The vigo plaster was applied, and allowed to remain seven days; on its removal, it was found that no suppuration had been established, with the exception of four pustules, and these were situated near the mouth, and had not been in contact with the plaster. This patient was radically and rapidly cured, and no scars were manifested."

The mode of application of the mercurial ectrotic is thus stated by Sir Joseph Oliffe: "The whole face should be covered with a mask of the vigo plaster, merely leaving a space for the mouth, nostrils, and eyes. A little mercurial ointment is applied to the eyelids." "The plaster is allowed to remain for three days in simple small-pox, and for four in confluent." In the event of any objection to the plaster

[1] Lancet, vol. i. 1840–41, p. 674.

arising, mercurial ointment may be substituted with a fair prospect of benefit. I recently suggested this plan of treatment to a young practitioner who had several cases of small-pox under his care; he reported to me that within half an hour of applying the unguentum hydrargyri fortius to the skin, the troublesome itching was entirely stopped and the pustules ceased to grow. Serres entertained the belief that the mercurial treatment would effect the miscarriage of the eruption, at whatever period it was used; but Briquet has satisfactorily shown that the eruption remains unmodified, if it have reached its pustular stage. The proper period for the application of the remedy is the second day, or, at the latest, the third day of the eruption. Its effect is to produce immediate resolution of the eruption, or to arrest it at the papular or vesicular stage; it never becomes purulent, and the skin between the pustules is never inflamed and swollen. But, however powerless as a perfect ectrotic the mercurial application may be when used in the pustular stage, it would seem, from the evidence of Sir Joseph Oliffe, that the local inflammation is much modified and ameliorated. According to Briquet, "the mercury acts as an antiphlogistic, or resolutive, in destroying or suppressing the local inflammatory process; or it exercises a specific action on the cause, whatever it be, which produces the variolous pustule." From his researches on other inflammations of the skin, the latter of these propositions would appear to be the most correct.

It is interesting to learn, that in the progress of his experiments, Briquet ascertained that mercury possessed precisely the same influence over vaccinia as over variola, an additional fact in evidence of the identity of these diseases.

The mercurial ectrotic treatment has been adopted with success by Dr. Hughes Bennett, in Edinburgh. He employed an ointment consisting of the unguentum hydrargyri fortius, an ounce, mixed with one drachm of starch powder. The ointment was applied pretty thickly over the face night and morning, with the result of preventing itching and swelling of the skin, the deep red stains which small-pox commonly leaves behind it, and the formation of pits. In the instance of two sisters, in whom I employed a similar means, all irritation and discomfort of the skin was prevented; but symptoms of salivation showed themselves in the course of a few days, the mouth was tender, and the salivary glands enlarged and painful. If the same beneficial result could be obtained without the mercury, the discovery would be of much importance.

I have not heard of any injurious effects following the use of the mercurial ectrotic, but M. Piorry has recommended in its stead the application of blisters. The advantages of his method he conceives to be the avoidance of any risk of salivation, and of the danger of repulsion. The blister, he remarks, is derivative in its action, and not repellent; but he, at the same time, admits the possibility of ischuria as a consequence of its use.

I cannot recognize for a moment the doctrine of repulsion, or the theory upon which it is based, in connection with the arrest of the serious effects of small-pox upon the face; the only part of M. Piorry's

objection which merits attention is the chance of exciting salivation, which is known to be an occasional normal accompaniment of the variolous fever. If this fear should sway the mind of any of my readers, and if salivation, on the one hand, and ischuria on the other, should seem to them to prohibit the use of both remedies, there is another, against which neither objection holds; although I believe it to be inferior in power to the mercurial ectrotic. I allude to the tincture of iodine. This fluid is to be pencilled on the eruption, at as early a stage as possible, once or twice a day. Dr. Crawford, of Montreal, first called attention to the remedy, in 1844, and gave a favorable report of its success; and his report has been corroborated by the subsequent practice of other medical men in British America and the United States. Its good effects are, the alleviation of inflammation, pain, swelling, and itching, the arrest of development of the pustules, the prevention of the red stains which follow the eruption, and the considerable reduction in extent of the pitting of the skin. In this latter respect, the tincture of iodine is decidedly inferior to the mercurial ectrotic.

The impermeability, tenuity, transparency, and simplicity of application of collodion, have given it a place among the substances which, acting upon the property of excluding air, have been employed as ectrotic remedies. It possesses the advantages of extreme cleanliness, and of enabling the operator to see what is passing beneath, without requiring to disturb it. Another of its properties, namely, its contractility, must also be considered as an agent in its beneficial effect, since by means of the peculiar pressure which it exerts upon the skin, it will disperse the congestion of that tissue. Being incapable of producing ptyalism, it is free from any objection of that kind. It has been made the subject of experiment in France, and favorably reported on by Dr. Aran, of the hospital Bon Secours.[1]

The ethereal solution of mastich and iodine[2] of Dr. Thomas Smith Rowe, of the Margate Infirmary, would, with less iodine, probably be found to be an improvement on the tincture of iodine or collodion, and to combine the properties of both.

An impression subsisted among the ancient physicians, that the light of the apartment in which small-pox patients are kept should be either modified or excluded. In pursuance of this view, and at the suggestion of John of Gaddesden, the rooms were hung with scarlet cloth, and the windows carefully blocked up. So recently as 1832, Dr. Picton,[3] of New Orleans, asserts, that in his practice no instance of pitting after small-pox occurred when the light was shut out. Serres placed a glass capsule over a small-pox pustule, and observed the effects produced by excluding the air and light. He found that, in proportion to the exclusion of both was the development of the pustule checked, and that when they were completely shut out, the pustule became shrivelled and quickly dried up. Moreover, Serres

[1] Bulletin de Thérapeutique, vol. xxxix. p. 369.
[2] Vide "Selected Prescriptions."
[3] American Journal of Medical Science.

remarks that he never reaped such successful results, in the cure of small-pox, as he did at La Pitié, during one year that the patients were placed in a kind of cellar, which was very dark, and ill-ventilated. The same principle has been more recently acted on by M. Legrand, who proposed to the Academy of Medicine, in 1839, the plan of covering the surface of the body with gold leaf. After the experiments of M. Fourcault (page 79), this practice would appear somewhat hazardous.

VARICELLA.

Syn. *Modified Small-pox. Varioloid. Spurious Small-pox. Variolæ pusillæ; verrucosæ; crystallinæ. Variola lymphatica. Verole volante.* Fran. *Unachten Kindpocken.* Germ.

During the prevalence of an epidemic of small-pox, the variolous contagion develops itself in a variety of forms, some of which are remarkable for their severity, and others for their exceeding mildness. A medium state between these two extremes has been denominated benignant small-pox. Upon closer investigation, it is perceived that benignant small-pox, and all the most serious varieties of this disease, are characterized by the appearance of eruption pursuing a given course within a given space of time, and presenting a regular succession of alterations. On the other hand, it is likewise perceived that there are several forms of eruption resulting from the same variolous contagion, which are deficient in the characters needful for their consideration with the preceding group. They are much milder in their local, and, for the most part, in their constitutional nature, and their course is limited to a shorter period. It is to this second group that the term varicella (modified small-pox) properly applies, and under this head I shall proceed to describe the different varieties which small-pox, in its modified form, is capable of assuming.

Variola, it has just been observed, occasionally appears in its varicellar form without any obvious cause, the modification probably depending upon some present state of constitution of the individual. Thus, it not unfrequently happens that a single member of a family may be affected by varicella, while several others of the same family have true variola. But the individual so affected with varicella in this instance may, during a future epidemic, be attacked with genuine small-pox. At other times, and these are the most frequent, the eruption is modified by that state of constitution which succeeds to vaccination, inoculation, or a sporadic attack of small-pox. Hence, after the preparation of the system by either of these affections, the contagion of variola gives rise generally to varicella, and but rarely to the genuine small-pox. If other proof were needed of the close relation subsisting between variola and varicella, it would be found in the fact that the latter is infectious and contagious, and is capable of communicating true variola to a sound person.

Varicella, in this point of view, may be regarded as an arrest of development of variola, and the forms which it is capable of assuming may, consequently, be deduced from the observation of the natural course of small-pox. Thus, if the variolous disorder were to expend

itself in its first stages, we should have a varicella resembling the papular eruption of small-pox, in other words, a *papular varicella;* if the variolous disorder progress beyond this stage, we shall then have a *vesicular varicella;* and if it proceed still further, a *pustular varicella.* The latter, however, is capable of presenting some modifications; in one of these the contents of the conical vesicles are simply transformed into a purulent fluid, without any alteration of their form; this constitutes the *conical pustular varicella;* in another, the purulent fluid distends the vesicle to so great an extent that it presents a globular figure; this is the *globular pustular varicella;* while in a third the pustules assume the characteristic features of those of variola, being flattened and umbilicated; this, which is the most advanced grade of varicella, is the *umbilicated pustular varicella.* Moreover, it has been remarked, that in varicella, as in variola, the constitutional affection may be present without the eruption, constituting *varicella sine varicellis.*

It must not be supposed, however, that any one of these forms occurs singly; the distinction is intended merely to apply to the general predominance of one or the other, for each variety is more or less commingled with the rest, and, in some instances, all the forms appear upon the same individual in nearly equal proportion. In describing the varieties of varicella, it will be convenient to reverse the order of relation here laid down; thus, in a tabular plan, these varieties are—

PUSTULAR VARICELLA:—Umbilicated pustular varicella,
Globular pustular varicella,
Conical pustular varicella.
VESICULAR VARICELLA.
PAPULAR VARICELLA.
VARICELLA SINE VARICELLIS.

Varicella makes its invasion with symptoms resembling those of small-pox, but much milder in degree. In some instances they scarcely amount to more than mere indisposition, while, on the other hand, they may be severe. The chief of these symptoms are feverishness, uneasiness at the epigastrium, nausea, vomiting, pains in the loins and in the head, with accelerated pulse. At the end of a few days, usually three or four, the eruption makes its appearance in the form of red points and spots, which resemble those of small-pox. The constitutional symptoms are relieved by the eruption, and gradually decline. The eruption, however, proceeds on its course, advancing, if it be of the pustular kind, quickly through the papular and vesicular to the pustular stage, arriving at its height by the fourth or fifth day, and then declining without any increase of the constitutional symptoms, and without the secondary or suppurative fever which occurs in small-pox. The pustules speedily dry up and form thin brownish scabs, which fall in another few days, and leave but a slight and transient pitting of the skin, with a few discolored red or purplish spots. When, however, the pustules are broken and lacerated by scratching, cicatrices of small size occasionally result. Varicella in

its progress, is accompanied by a broad and patchy areola of a pale red color, which contracts its boundaries as the pustule advances, and ultimately forms a narrow, brownish circle around its circumference.

The urine in varicella, when the fever is mild, differs very little from the normal state of that secretion. "Schönlein states, that in the first stage of this disease the urine is often as limpid as in hysteria." While "in a case of varicella, in which the early symptoms were extremely severe, the urine was passed in very small quantity, of a deep red color, and a specific gravity of 1.022–7."[1]

UMBILICATED PUSTULAR VARICELLA.

Syn. *Varioloid. Modified small-pox. Varicella cellulosa*, Cross.

The precursory symptoms of this variety of modified small-pox usually continue for three or four days, and are succeeded by an eruption of red spots, which soon become hard and papular in the centre. On the second day of eruption the papulæ are conical in form, and vesicular at their points. On the third and fourth days the vesicles increase in size, and become flattened and umbilicated, while their contents lose their transparency, and assume an opaque and whitish hue. During the fifth and sixth days the suppurative stage is established, but without secondary fever, and the pustules on the face desiccate and form scabs. On the seventh day desiccation occurs on other parts of the body, and by the eighth the whole of the pustules are covered with yellowish-brown scabs, which, in a few days more, are detached and fall off. The process of desiccation commences at the centre of the pustule, and proceeds towards the periphery, and the scabs at their fall leave a slight pitting, and red or livid discoloration of the skin, which lasts for a few weeks, but no cicatrices or permanent impressions remain behind.

Umbilicated pustular varicella is generally commingled with the conical and globular forms of the eruption, and also with the papular and vesicular kinds. It sometimes appears in successive eruptions, and in this case it is not uncommon to find on the skin, at the same time, papulæ, conical vesicles, with their thin scabs; and conical, globular, and umbilicated pustules, with their thicker and browner scabs.

VARICELLA GLOBULARIS.

Syn. *Globular varioloid. Hives.*

The globular variety of varicella is characterized by the form and large size of the pustules, which surpass those of all the other varicellæ. At its height the dome of the pustule is larger than its base, which it consequently overhangs, and the latter is not quite circular in outline. The precursory symptoms of this variety are usually severe. They are succeeded by the eruption of a number of red spots, having in their centre a small, prominent, and globular papula, which speedily increases in size and becomes vesicular at its summit. On

[1] Simon, vol. ii. p. 282.

the second or third day of the eruption, the contents of the vesicles assume an opalescent and pearl-white color, particularly towards the centre. On the fourth and fifth days, the vesicles go on increasing in size, the contained fluid becomes purulent, and the areolæ, by which their bases are surrounded, of a bright red color. On the sixth the vesicles attain their greatest bulk, their contents are more purulent, and the areolæ still further increased in redness. On the seventh and eighth days they begin to diminish, their parietes are flaccid and wrinkled, and desiccation is established. On the ninth day the desiccation of the pustules is completed on the greater part of the body, and they are converted into brownish lamellated scabs, which are loosened and thrown off during the two or three succeeding days, leaving behind them some slight impressions, and a temporary congestion of the derma.

Globular varicella is not unfrequently mingled with the pustules of the umbilicated and conical varieties. The ordinary duration of this eruption is ten or twelve days, but if the pustules be developed successively it may be continued for a few days longer.

VARICELLA CONIFORMIS.

Syn. *Conical varioloid. Swine-pox.*

The conical variety of varicella is recognized by the form of its pustules; they are developed, like the preceding, after two or three days of constitutional symptoms, upon red spots, which soon become papulated in the centre, and surmounted by whitish and opaque elevations of the epidermis. During the third day the size of the vesicle is increased, its form has become more distinctly conical, and its base more highly inflamed. During the fourth and fifth day, the vesicles still further augment in bulk, their contents become purulent, and the areola which surrounds them more inflamed. On the sixth day, they are flaccid and wrinkled, and begin to desiccate; and on the seventh are covered by prominent scabs of a yellowish, or yellowish-brown color, which fall in the course of a few days. The pustules of conical varicella are sometimes very numerous, and collected into closely set clusters; they are usually attended by considerable pruritus, and are not unfrequently intermingled with the pustules of the umbilicated variety. The ordinary duration of the eruption of varicella coniformis is eight or ten days, but when it occurs in successive attacks, it may be continued for a few days longer.

When the vesicles are torn and broken in attempts made by the patient to relieve the itching, the spots become inflamed, they ulcerate, and secrete a thick pus, which concretes into scabs of a greater thickness than those of the natural pustules. These scabs are of a dark brown, or blackish color, they remain longer than the thinner scabs of the pustules, and leave cicatrices at their fall. Such accidents occur most frequently upon the face.

VARICELLA VESICULARIS.

Syn. *Varicella lentiformis*, Willan. *Varicella lymphatica. Chicken-pox.*

Vesicular varicella, or chicken-pox, is preceded by febrile symptoms, which are very mild in the discrete form of the eruption, but severe in the confluent kind. The eruption makes its appearance in the form of small, red, and slightly raised spots, of an oval or irregular form. On the second day, a minute transparent vesicle is developed in the centre of each of these spots. On the third day, the vesicles go on progressively increasing; they are flattened on their summits, and the contained fluid, transparent and limpid at first, becomes yellowish, opaque, and lactescent. On the fourth day they begin to collapse and shrivel, and on the fifth and sixth, to desiccate into thin, brownish, and lamellated scabs, which fall on the eighth or ninth day, leaving behind them a slight congestion of the derma, but no depression. While this course is being pursued by the vesicles which first appear, others are successively developed, so that the eruption may be seen at once in all its stages, and may be prolonged to ten or twelve days, and sometimes to two or three weeks. The eruption of chicken-pox appears first on the back, and thence extends to the rest of the body; it is attended with much itching, and many of the vesicles retain their papular or aborted form; the perfected vesicles are surrounded by an inflamed areola of small extent.

VARICELLA PAPULARIS.

Syn. *Varicellà verrucosa. Horn-pox. Variolæ verninosæ; verrucosæ.*

This is the most simple, and, at the same time, the least severe form of varicella. After the invasion of febrile symptoms of the mildest kind, an eruption of red spots, followed by papulæ, is developed on the surface of the skin. The papulæ are various in point of size, and hard to the touch, but they offer no disposition to proceed to the evolution of vesicles and pustules. The redness fades in the course of a few days, and the papulæ are gradually lost. The eruption of papular varicella rarely exists alone; it is usually commingled with one or other of the more advanced varieties.

VARICELLA SINE VARICELLIS.

Varicellar fever occurs chiefly in those who have been inoculated or vaccinated, or have previously suffered from variola. It is occasionally, though rarely, observed during the prevalence of epidemic variola.

Diagnosis.—Varicella differs from small-pox in several essential particulars, namely, in the lesser degree of severity of the constitutional symptoms; in the shortness, of course, of the eruption; in the absence of secondary fever; in the appearance of the eruption at its height; in the minor degree of inflammation surrounding the pustules;

in the thinness of its scabs; and in its freedom from permanent impressions and cicatrices.

At the earliest moment of eruption, it is impossible to establish a distinction, since both affections are developed in the form of red spots with central stigmata.

CAUSES.—Varicella originates in the variolous contagion, and frequently precedes or follows an epidemic of small-pox. This observation would lead to the inference that, at the commencement, the variolous contagion had not yet gathered sufficient power to excite true small-pox in any but the most susceptible, and that, at the conclusion of the epidemic, the contagion had lost the strength necessary to awaken any but a modified affection. The inference, in truth, is correct; for when in a state of dilution, the variolous contagion is capable of producing only varicella in persons of average susceptibility. In those who possess the susceptibility of infection in a high degree, true variola may be excited; and for the same reason, the contagion of varicella is apt to communicate variola to individuals so constituted. Another condition conducive to the development of varicella is deficient susceptibility. In some instances, this deficiency is the result of constitutional idiosyncrasy; in others, and they are the most usual, it is the consequence of a modification of the system, produced by vaccination, by inoculation, or by a previous attack of variola.

Varicella is infectious and contagious, and transmissible by inoculation. Its contagion may excite either varicella or true small-pox. The result of inoculation is similar; in one instance varicella may be developed; in another, true variola. The variola communicated by varicella is for the most part mild, but the severity of the affection would appear to depend upon the constitution of the individual, rather than upon the nature of the contagion. Varicella may occur repeatedly in the same person, and it possesses less preservative power against the contagion of small-pox than vaccination.

Vesicular varicella, or chicken-pox, is stated to have occurred as an epidemic, and independently of variola; Dr. Mohl[1] observes, that at Copenhagen the chicken-pox occurred annually between the years 1809–1823, without any association with small-pox. And Dr. Watson remarks, "It must, therefore, I think, be admitted that there is a separate disease called chicken-pox, which springs from a specific poison." Vesicular varicella is less easily transmissible than the other forms. When inoculated, varicella of the same kind is sometimes developed, at other times the pustular form, and again, true small-pox.

PROGNOSIS.—Varicella is generally a mild disease, and one of favorable termination. Sometimes, however, it issues fatally, and during certain variolous epidemics, is remarkable for the severity of its concomitant symptoms, or for a fatal tendency. The umbilicated pustular varicella is the most serious of its varieties.

TREATMENT.—The treatment of varicella is to be conducted on the

[1] De Varioloidibus et Varicellis.

same principles as that of variola. If there be congestions, they must be combated as they arise; and if the eruption should recede, it must be re-excited by stimulation of the skin. In ordinary cases, the simplest antiphlogistic management is all that is needed.

VACCINIA.

Syn. *Variola vaccina. Variolæ vaccinæ. Cow-pox. Cow small-pox.*

Variola vaccina, the small-pox of cattle, is a contagious inflammation of the skin, prevalent among cattle, and occasionally communicated to man. It is characterized by the development, upon inflamed bases, of multilocular and umbilicated vesicles, which pass by degrees into the pustular form, and terminate in hard, dark-brown scabs, the latter leaving behind them deep and permanent cicatrices. Variola vaccina is accompanied by constitutional symptoms, which are mild during the first stages of the vesicle, but become more severe, and constitute a secondary fever, when the local inflammation arrives at its height, and the suppurative process is about to be established.

The existence of a disease identical with small-pox among the inferior animals, is a theorem that might, *à priori*, be predicted. It is perfectly consistent with our knowledge of the physiological laws, and comparative structure of man and animals. It is a position well established with regard to some other diseases, and there can be no doubt that still further analogies in relation to pathology will be unveiled by future research in that most interesting department of medical science. The announcement of the discovery of a disease analogous to small-pox in the cow, in the horse, or in any other animal, at the present day, would occasion little surprise; it is admitted, indeed, as a principle, in the first rudiments of our physiological education; but when this declaration was made in 1796 by the immortal Jenner, it was a bold soar of genius, and too enlightened for the philosophy of his age. It is now, however, well established, that small-pox has for centuries been prevalent among animals in all parts of the world; that it has made its invasion as an epizootic, and, for the most part, in connection with a similar pestilence among men. Jenner was acquainted with the fact of the occurrence of a disease in the horse, which was communicable to the cow, and capable of engendering in the latter animal an eruption that could not be distinguished from the true vaccinia. This disorder in the horse was, unquestionably, the equine small-pox; it was, however, from the circumstance of its development in a situation where, from the thinness of the skin, eruptive disease in a mild form would most naturally occur, namely, in the heels, confounded with a more common disease of that region, the *grease*. By a wrong inference drawn from this observation, an inference perfectly natural and perfectly excusable in the state of science at that period, an inference which its distinguished author subsequently relinquished, namely, that the variolæ vaccinæ had their origin in the horse, Jenner created an argument which, for many years, was industriously employed as an objection to the philosophy of his

views; with how little injury to the splendor of his discovery, we who live can tell.

In the excellent report[1] of the Vaccination Section of the Provincial Medical Association, the committee remark that the ravages of this epizootic are not confined to one region of the earth; that such as it has been seen in the valleys of England, it has likewise been observed upon the mountains of the Andes, on the elevated ranges of the Himalayas, in the plains of Lombardy, in the green pastures of Holland, and on the sunny slopes of Asia. It is interesting, moreover, to learn, that in Bengal the natives apply to this disease the self-same appellation that they give to the small-pox in the human subject, namely, *bussunt*, *mhata*, or *gotee*. It would be so much out of place, in a work dedicated to practical purposes, to go into the numerous inquiries and arguments that have been raised upon the question of the history and analogies of cow-pox, that I shall content myself with stating the facts which I conceive to be established relative to this disease, and the principal observations by which those facts are supported. The facts to which I allude are—

1. The prevalence, at the same period, of the cow-pox among cattle, and the small-pox among men.
2. The transmission by *contagion* of the small-pox to cattle, and the consequent development of cow-pox in those animals.
3. The transmission by *inoculation* of the small-pox to cattle, and the consequent development of cow-pox in those animals.
4. The transmission by *contagion* of the cow-pox to man, and the consequent development of a pustule similar in character to the vaccine pock of the cow.
5. The transmission by *inoculation* of the cow-pox to man, and the consequent development of a pustule similar in character to the vaccine pock of the cow.
6. The transmission by *inoculation* of the cow-pox to man, and the consequent development of an eruption similar to, if not identical with, small-pox.

The first of these theorems appeals to history for its proof, and is additionally substantiated by the facts which tend to support the second proposition. Its accuracy has been verified also by several practitioners during the recent epidemic of small-pox in England. Mr. Gibson,[2] in a sketch of the province of Guzerat, states that variola carries off annually many persons, and "the same disorder is at times very fatal among the cattle." Mr. Macpherson, writing from Murshidabad in 1836, observes, that the disease among the cows has not occurred in that province for two years; that during the same interval very few cases of variola have been known, and from these circumstances he infers "that the unknown causes which favor the disease in the human subject have the same tendency in the cattle; in fact, the variola, and mhata or gotee, owe their origin to the same cause." Mr. Lamb, stationed at Dacca, remarks, in 1836, that during the

[1] Transactions of the Provincial Medical Association. Vol. viii., 1840, p. 1.
[2] Transactions of the Medical and Physical Society of Bombay. Vol. i.

prevalence of variola, the cow-pox "appeared in one muhalla, and carried off fifteen or twenty cows."

The transmission by contagion of the small-pox to cattle, which rests upon the assertion of numerous observers, is strikingly illustrated by Mr. Ceeley,[1] in the following narrative: "On Friday, the twenty-second of October, 1840, my friend Mr. Knight informed me by letter, that he had on that day seen on the hand of a patient, Mr. Pollard, aged fifty-six, who had never had small-pox or vaccine, two broken vaccine vesicles, which the patient said he had caught while milking his own cows, some of which he knew were affected with the same disease, and were then very difficult to milk." Mr. Pollard at the same time expressed his conviction "that his cows had been infected from human small-pox effluvia, to which he considered they had been exposed." It appears that the small-pox had been prevalent in the village of Oakley, and the last three persons attacked were two women and a child. "The two cottages in which these three patients resided during their illness were situated on each side of, and closely connected with, a long narrow meadow, or close, comprising scarcely two acres. The first-named patient, though thickly covered with pustules, was not confined to her bed after the full development of the eruption, but frequently crossed the meadow to visit the other patients, the woman and child, the former being in great danger with the confluent and malignant form of the disease. She died on Monday, the seventh of September, and, according to custom, was buried the same evening. The intercourse between the cottages across the close was, of course, continued after this event. On the following day the wearing apparel of the deceased, the bedclothes, bedding, &c., of both patients, were exposed for purification on the hedges bounding the close, the chaff of the child's bed was thrown into the ditch, and the flock of the deceased woman's bed was strewed about on the grass within the close, where it was exposed and turned every night, and for several hours during the day, until the thirteenth of September, eleven days. On that day the above-mentioned eight milch cows and two sturks were turned into this meadow to graze. They entered it every morning for this purpose, and were driven from it every afternoon, to be transferred to a distant meadow to be watered and milked, where they remained through the night. Whenever the cows quitted the meadow in question in the afternoon, the infected articles above-mentioned were again exposed on the hedges, and the flock of the bed spread out on the grass, and repeatedly turned, where it remained till the morning, when the cows were readmitted." It appears, however, that the removal of the infected articles was not always accomplished so punctually as had been enjoined, for both the proprietor and the milkers affirm, that on one occasion, at least, they observed the bed-flock on the grass, and the cows amidst it, and licking it up. The proprietor positively declares, and the milkers corroborate his statement, "that the animals were in perfect health on their first entering this close, but within twelve or fourteen days of that event, five of the

[1] Transactions of the Provincial Medical Association. Vol. x., 1842, p. 211.

milch cows appeared to have heat and tenderness of the teats, upon which, imbedded in the skin, were distinctly felt small hard pimples, which daily increased in magnitude and tenderness, and in a week or ten days rose into blisters, and quickly ran into brown and blackish scabs. At this period, when the teats were thus blistered and swollen, and very tender, the constitutional symptoms were first observed, viz., sudden 'sinking,' or loss of milk, dribbling of saliva from the mouth and frequent inflation and retraction of the cheeks, starring of the coat, 'tucking up of the limbs,' and 'sticking up' of the back, and rapid loss of flesh; the process of milking was now very difficult, disagreeable, and even dangerous; and on the fourteenth of October, the middle of the third week, the detachment of the crusts and loose cuticle, and the abundant discharge of pus on attempting to milk, compelled the milkers to desist, for the purpose of washing their hands. Soon after this period, the cows became by degrees more and more tranquil, as the tenderness and tumefaction of the teats subsided, and finally, milking was performed with comparative facility, and at the period of our visit, scarcely any trouble arose in the performance of the operation, though here and there a teat seemed still tender." In his remarks upon this case, Mr. Ceeley observes, "Another circumstance, too, requires to be particularly noticed; it is the fact of the occurrence of the vaccine disease on a young sturk, which, of course, could not have been induced by those casualties which commonly propagate it among milch cows, but simply by the cause which originated the disease in the other five animals, whatever that may have been. The sturk is not considered liable to the vaccine; at least so it is inferred in this neighborhood, because no one has ever seen the animal affected by it."

It is scarcely needful to add more evidence to that conveyed in the preceding paragraph, in proof of the communicability of the contagion of small-pox from man to cattle, but I cannot forbear quoting one or two further illustrations; the first is contained in the following brief extract from a letter addressed by Dr. Waterhouse, of Cambridge, Massachusetts, to the celebrated Jenner: "At one of our periodical inoculations," says the writer, "which occur in New England once in eight or nine years, several people drove their cows to an hospital near a populous village, in order that their families might have the daily benefit of their milk. These cows were milked by persons in all stages of small-pox; the consequence was, the cows had an eruptive disorder on the teats and udders so like the small-pox pustule, that every one in the hospital, as well as the physician who told me, declared the cows had the small-pox." Dr. Sunderland, of Bremen, communicated the small-pox contagion to cows, by covering them with sheets between which persons fatally affected with small-pox had lain. These experiments were successful in a few cases, after many trials.

The third proposition, namely, the transmission of small-pox to cattle by means of inoculation, and the consequent development of cow-pox in those animals, is also established on abundant evidence, for the chief of which we are again indebted to the zealous perse-

verance of Mr. Ceeley, of Aylesbury. It is stated by Dr. Macmichael, in an essay read before the College of Physicians in 1828, that "vaccine matter having failed in Egypt, medical gentlemen were led to institute certain experiments by which it has been discovered that, by inoculating the cow with small-pox from the human body, fine active vaccine virus is produced." M. Viborg, of Berlin, is reported to have inoculated cattle, and several other classes of domestic animals, with success.

Mr. Ceeley instituted a series of experiments on the inoculation of the cow with variolous lymph in the month of February, 1839. In his first subject, no effect was observed for nine days, at the end of which time, one out of seven punctures, inoculated with virus of the seventh or eighth day, presented the appearance of a tubercle. On the tenth day, this tubercle had all the characters of the vaccine vesicle; by the fifteenth day the vesicle reached its acme, and was "truly splendid." Decline commenced on the sixteenth day, the crust was well formed on the seventeenth, but was rubbed off prematurely. In this experiment the vesicle was retarded five days; the usual period of maximum development of the variolo-vaccine pock being the tenth day. In a second experiment, the first inoculation failed. After reinoculation, four out of the seven punctures looked purplish or livid on the fifth day, and were vesicular, with incipient central crusts, on the sixth day. By the tenth day, they had attained their acme. On the eleventh, decline had commenced, and progressed gradually till the twenty-sixth day, when the crusts fell, leaving behind them smooth, rose-colored pits.

The fourth proposition is one so well established as to require no especial remark. The nature of the affection resulting from this contagion is considered in the section entitled "Casual variolæ vaccinæ in man." The fifth proposition is equally satisfactory in its proof; the effects of "primary lymph" from the variolæ vaccinæ will be stated at a future page.

In support of the fact announced in the sixth proposition, it has been observed, that when the epizootic disease presented characters of great severity, the symptoms produced on man by inoculation from such cases were also severe, and often serious, contrasting strongly with the mild affection engendered by the virus from the ordinary discrete form of cow-pox. Mr. Macpherson, in experiments with this virus in Bengal, in 1837, found that an eruption was developed, which was identical with small-pox. Mr. Wood, of Gowalpara, in 1839, met with similar cases of so great severity, that he was led to contemplate the substitution of inoculation with small-pox virus, as a safer expedient. At Silhet, Mr. Brown removed some dark-colored scabs from a cow laboring under variolous disease, and triturating them in a mortar, he inoculated several children with the pulp. These cases exhibited nothing remarkable, excepting a somewhat greater degree of constitutional disturbance on the eighth day than usual. After two months, children inoculated from this stock were attacked on the eighth day with severe fever, "followed by an eruption, which spread over the whole body, and, in one case, proved fatal." The

eruption so produced bore all the characters of true small-pox. Thus, it would appear, that, as the small-pox virus, when introduced into the system of the cow, is so modified by the vital laws which regulate the functions of the animal as to produce an eruption of cow-pox; so, on the other hand, the virus of the cow, under like circumstances, is modified by the constitutional phenomena of the human organism, and is made to assume the characters of small-pox.

VARIOLA VACCINA IN THE COW.

Variola vaccina in the cow is by no means a common affection, and when it occurs is usually met with in milch cows—a circumstance attributable to the transmission of the contagion by the hands of the milkers. Occasionally the disorder appears as an epizootic, but more frequently in the sporadic form. In rare instances it would seem that the source of this contagion has been a variolous eruption developed in the horse, and mistaken for a more common vesicular disease of that animal, the *grease*. The vaccine disorder is modified by a variety of conditions, such as the temperament of the animal, the tone of its tissues, its state of health, the thickness of its skin, and its color. A slight difference is also observed in the disease, in relation to its origin in a sporadic form, or as the result of contagion communicated by the hands of milkers; the former of these varieties Mr. Ceeley terms *natural*, the latter *casual*.

Natural variola vaccina makes its invasion with heat and tenderness of the teats and udder, unaccompanied by constitutional symptoms; the inflamed surface is uneven, and pimply to the touch, and papulæ of a red color, hard, and as large as a pea, are soon developed. In three or four days from invasion, the papulæ have attained the size of a horse-bean; they are tender and painful, and vesicles are gradually raised upon their summits. The vesicles, increasing in size, become acuminated, ovoid, or globular, and are distended with an amber-tinted and viscid fluid. When ruptured, they present depressed centres, with an elevated and indurated margin; and when the epidermis is rubbed off, the surface of the corium is of a vivid red color, with a small central slough. When uninjured, or merely ruptured, without the removal of the epidermis, the vesicles desiccate into thick, dark-brown crusts, which commence in the centre, and proceed towards the circumference, appearing at first inlaid in the marginal elevation, and subsequently extending completely over it. The surface from which the epidermis is removed becomes covered by thin, brownish scabs, which are termed *secondary*.

Casual variola vaccina appears as an eruption on the fifth or sixth day after contagion, in the form of small, tender papulæ, which are developed upon the teats and neighboring surface of the udder. By the sixth and seventh days the papulæ have attained the size of a pea; they are reddish in color, and circular or oval in form. On the summit they become gradually depressed, assume a yellowish-white and pearly hue, and have a small central dot or linear impression. On the eighth or ninth day, the central concavity increases in depth, while the margin becomes more elevated, tense, and shining, more pearly or

silvery in its aspect, and the central depression acquires a bluish or slaty tint. At this period the pock is more than half an inch in diameter, and is surrounded by a narrow areola of a pale rose, or light damask hue. Between the tenth and eleventh day, the eruption reaches its acme; the elevations are now upwards of three-fourths of an inch in diameter, the areola has increased to four or five lines in breadth, and the integument beneath is tense and indurated. The central depressions have augmented in depth, their bluish, slaty color has acquired greater intensity, and the epidermis which invests them becomes distended with an abundance of lymph, and rises into a globular or conical vesicle. Many of these vesicles are now ruptured, others remain whole, but, in either case, they shrivel and desiccate into brownish or black crusts, which are first observed in the centre, and increase towards the circumference, until they reach and overlap the marginal border of the pock. The induration and enlargement of the latter diminish, and the crusts are thrown off spontaneously between the twentieth and twenty-third day, leaving a slightly depressed and smooth cicatrix, of a pale rose or whitish color. Such is the usual course of the cow-pock, but it necessarily presents many diversities of appearance, dependent upon aggravation of symptoms, &c. Thus, instead of forming crusts in the manner described, ulcerated and sloughing surfaces are sometimes produced, which remain for weeks in an irritable state. Moreover, casual vaccine variola always presents the eruption in every stage of its progress at the same moment, the elevations with their central depressions are intermingled with incipient papulæ, and while the crusts are being perfected in some, the vesicles are yielding in others to the distension of their lymph. This succession in the eruption depends upon the diffusion of the virus by the rupture of the vesicles, either in consequence of the movements of the animal, or by the milker, and the consequent revaccination of the neighboring unaffected skin. Mr. Ceeley has observed as many as sixty pocks upon the udder and teats of a single cow.

VARIOLA VACCINA IN MAN.

Variola vaccina may be communicated to man, either accidentally, or by voluntary inoculation. In the former case, the contagion is received directly from the animal, usually from the cow, but sometimes, as in the case of variola equina, from the horse. It had long been observed, that persons who had suffered from this disease were preserved against the influence of small-pox, and thence originated the practice, introduced by Jenner, of transmitting the contagion artificially to man, by means of inoculation.

It is a principle, well established in pathological science, that the animal system, once subjected to the influence of any disease originating in specific contagion, is protected, to a greater or less extent, against subsequent incursions of that disorder. Thus we observe that the modification which the system undergoes in the reception of rubeola and scarlatina, is protective of the individual against that contagion for the rest of life. The same circumstance is remarked

with regard to small-pox and other contagious fevers. When this fact was contemplated by the medical philosopher, in association with the fearful ravages of that dreadful pestilence and scourge of the human race, small-pox, such as it existed in former ages, the expedient suggested itself to his mind, that if the disease could be anticipated, if the disorder, in a mild form, could be communicated to man, life would be spared, and the system equally defended against the subsequent contagion of a more virulent and fatal disease. This design, happy in thought, and happy in application, gave birth to the practice of inoculation for small-pox. Inoculation for small-pox, however, was not free from objection; the disease thus engendered was always serious, often fatal, and frequently became the source of a malignant contagion. In this state of demi-subjugation small-pox was found by Jenner, when the well-known fact of the protective influence of cow-pox first engaged his attention, and aroused in his comprehensive mind the philosophic thought that spread happiness and security where gloomy anticipations and uncertainty had previously prevailed. He had the talent to perceive in cow-pox, small-pox in its mildest possible form; and he trusted that the transmission of this to man would insure the same results as inoculation with the virus of human small-pox. This trust was rewarded by the complete success which attended the prosecution of his views.

In the foregoing remarks I have endeavored to show that the advance of improvement to the Jennerian standard was progressive, and that it was created by the contemplation of the wants of the human race. Since Jenner's discovery, more than half a century[1] has glided away, half a century, moreover, replete with important and valuable discoveries, both in general and medical science. A portion of that half century has seen the attention of medical practitioners again engaged in considering the imperfections of our present means of defence against small-pox. A third era of discovery has dawned. It is seen that although, as a general rule, the principle announced in the preceding paragraph, namely, that the invasion of the contagious disease is protective against subsequent attacks of the same disease is correct, yet, that exceptions to this rule do occur so frequently, as to indicate the necessity for further investigation into the nature and history of small-pox, with a view to afford additional security against its ravages. Thus it has been observed, that secondary attacks of small-pox are not unusual, and that small-pox after vaccinia very frequently occurs. Instances of the latter kind, indeed, are so often met with, as to lead to the belief that vaccinia gradually loses its protective influence over the system.[2]

With a view to meet the declining influence of vaccinia, numerous propositions have been made, and modes of practice adopted, the principal of which are revaccination, retro-vaccination, variolo-vaccination, and an immediate return to the variolæ vaccinæ of the cow.

[1] Jenner's first experiment was made on the 14th of May, 1796.

[2] In a conversation which I recently had with Mr. Marson, he made the important practical observation that, after an imperfect vaccination, revaccination will often fail, while the person still remains open to the reception of small-pox.

These various modes of re-establishing the protective powers of vaccinia I shall examine in their turn, after having, in the first place, traced the history of the casual vaccinia, as observed and recorded by Mr. Ceeley, and having described the effects of ordinary vaccination with Jenner's lymph.

CASUAL VARIOLA VACCINA IN MAN.

The transition of the cow-pock contagion to man presents all the anomalies which are known to accompany exposure to other sources of contagion. Milkers who have never been vaccinated will sometimes escape altogether, while others who have been vaccinated or variolated, will take the disease; and instances not unfrequently occur in which persons who regard themselves secure, in consequence of having previously suffered from casual vaccinia, are a second time affected. In all the three latter cases, however, and especially in the last, the disorder is characterized by the manifestation of a much milder type than that of the unmodified disorder. The parts of the body usually affected in milkers are the backs of the hands, the flexures of the joints and sides of the fingers, and the face. When the eruption appears in the latter situation, the virus is conveyed by means of the hands moistened with the lymph of the ruptured vesicles. On the backs of the hands, and between the fingers, the epidermis is thinner than on the palmar surface, and consequently affords greater facility to its imbibition by the dermal tissues. For it is satisfactorily proven, that abrasion of the surface is by no means necessary to the inoculation of the disease. When, however, the epidermis is abraded, and the skin chapped, the effects of the virus are remarkable for severity, subcutaneous abscesses are liable to form, and the lymphatic vessels and glands frequently become inflamed.

The signs which indicate that the contagion has taken effect, are the appearance of inflamed spots or papulæ, which are hard to the touch, acuminated, and deep-seated. The papulæ are of a deep rose-red or purplish color, and are soon surmounted by an ash-colored or livid vesicle, which assumes the umbilicated character as it increases in size, and then becomes yellowish in the centre. At this period the areola makes its appearance, lymph is effused beneath the umbilicated epidermis, and a vesicle of variable size, and of a bluish or slate-colored aspect is developed. The local inflammation is sometimes so severe as to produce sloughing of the derma and serious constitutional disturbance.

In illustration of this affection, Mr. Ceeley[1] has recorded the following interesting case:

"Joseph Brooks, aged seventeen, a fine, healthy, intelligent young man, who had not been the subject previously of variola or of the vaccine, stated that he commenced milking on Friday, the ninth of October, and that his milking was confined to four cows, only one of which had the disease, from four to six vesicles on each teat. He milked these four cows occasionally, and continued to do so till the

[1] Transactions of the Provincial Medical Association, vol. x., p. 216.

eighteenth of the same month (ten days), having milked them in that period six times. On this day (the eighteenth) he felt the cervical absorbent glands and lymphatics stiff and tender, and on the twentieth found a pimple on the temporo-frontal region, which he could not resist scratching. On the day before that he observed on his finger a red pimple, of the size of a pin's head; on the next day one on the thumb, very small. In neither situation was he aware of the pre-existence of any visible wound or abrasion of the cuticle. On the twenty-first he had headache, general uneasiness, and pains in the back and limbs, with tenderness and pain in the course of the corresponding lymphatic vessels and absorbent glands, particularly of the axilla, which increased till the twenty-third, when nausea and vomiting took place. His right eyelids became swollen, and were closed on that day; but after this period he became better, in all respects, never having been confined to the house, although disabled from work. The vesicle on the temporal region had a well-marked central depression with a slight crust, a general glistening appearance, and was of a bright rose or flesh color, with a receding areola, and there was an inflamed, tumid, and completely closed state of the corresponding eyelids.

"On the finger the vesicle was small and flat, with a slightly depressed centre, containing a minute crust. It had a beautiful pearly hue, and was seated on a bright, rose-colored, slightly elevated base. On the thumb the vesicle was also flat and broad, but visibly depressed towards the centre, where there appeared a transverse linear-shaped crust, corresponding doubtless with a fissure in the fold of the cuticle. The vesicle was of a dirty, yellowish hue and visibly raised on an inflamed, circumscribed base; lymph was obtained from a vesicle on the temple, in small quantity, by carefully removing the central crust, and patiently waiting its slow exudation. In this, as in most other respects, it strikingly resembled the vesicle on the cow, and appeared as solid and compact. The lymph was perfectly limpid, and very adhesive. No lymph was taken from the vesicles on the finger and thumb, with a view to avoid any interruption of their natural course.

"On the twenty-sixth and twenty-seventh, when the redness and elevation of the base of the vesicles had materially diminished, the vesicles themselves had become greatly enlarged. On the thumb and finger they were loosely spread out at the circumference, each having a dark and deep central slough. On the temple, the margin of the vesicle, as on the cow, was firm and fleshy, its diameter being nearly ten lines, and its centre filled with a dark brown firmly adherent slough. In about seven or eight days, by the aid of poultices, the sloughs separated, and the deep ulcers healed, leaving cicatrices, like variola, deep, puckered, and uneven, which were seen on the twenty-fifth of November."

INOCULATED VARIOLA VACCINA.

The inoculation of variola vaccina, or, as it is popularly termed, *vaccination*, consists in the transference of a small portion of the con-

tents of the vaccine vesicle, the vaccine lymph or virus, to the papillary surface, or to the tissues of the derma of a sound person. This object is effected by means of a small puncture, by several punctures, by a number of superficial scratches, with the point of a lancet or needle imbued with the virus; or, as recommended by Mr. Crosse,[1] by means of a small blister. The blister is produced by retaining upon the arm a piece of adhesive plaster, in the centre of which has been placed a fragment of emplastrum lyttæ, not larger than the head of a small pin. When the blister is formed, the lymph is to be deposited on the exposed surface of the derma. Mr. Crosse found this proceeding very successful in the case of a strong child, who resisted the operation in the usual way; and it is worth bearing in mind in cases where the ordinary operation has more than once failed. Another, and rarely practised mode of vaccinating, is to make a small incision, and place within it a thread impregnated with the vaccine lymph. The punctures are made obliquely through the epidermis, in order that the papillary surface may be attained without the effusion of blood, or with the escape of as little as possible. The virus which is in this manner introduced into contact with the derma is dissolved in the fluids of the tissues, and imbibed into the system, its agency thereon being indicated by certain local and constitutional effects.

The local signs indicating that the vaccination has taken effect are first apparent on the third or fourth day after the operation, at which period there is a slight degree of elevation and hardness of the skin (papular stage) at the seat of the puncture, and a trifling blush of redness immediately surrounding it. On the fifth and sixth day, a small quantity of liquor sanguinis is effused beneath the epidermis, and a vesicle is formed, which is whitish and pearly in appearance, of a roundish or oval figure, and umbilicated at its centre. The vesicle goes on increasing in size until the eighth or ninth day, at which period it has become fully distended, and has attained its perfect development. On the ninth day it loses the umbilicated form, it becomes flattened on the surface, and sometimes more convex than at the circumference, and is composed of numerous small cells, which are filled with a limpid and transparent lymph.

On the eighth day (sometimes the ninth), the perfect vesicle is surrounded by an inflamed variola, of a vivid red color (*the pearl upon the rose*), which gradually increases in extent from a few lines to more than two inches in diameter. The skin included by this areola is inflamed and tumefied, and is frequently the seat of eruption of a crop of small transparent vesicles. On the tenth day, the redness and heat have increased; there is considerable itching in the part, the movements of the arm are somewhat painful, and the axillary glands are liable to become tender and swollen. It occasionally happens, that at this period an erythematous blush spreads from the arm, over the surface of the body, in irregular patches.

On the eleventh day the areola begins to diminish, the fluid contained within the vesicle has become purulent, and desiccation

[1] Lancet, vol. ii., 1850, p. 642.

commences at its centre and proceeds gradually towards the circumference. During the succeeding days, the areola disappears more and more, the tumefaction subsides, and the vesicle desiccates into a dark brownish crust, of an irregular form. The crust, by a continuance of desiccation, diminishes in size, and assumes a blackish hue. It is detached at the end of seventeen days after vaccination, and leaves upon the skin a depressed cicatrix, at the bottom of which are seen numerous small pits (foveolæ), which correspond with the separate cells of which the vesicle was composed. The cicatrix is permanent, enduring for the remainder of life.

To recapitulate: the two or three first days are those of *incubation;* the fourth is *papular;* the fifth, sixth, seventh, and eighth, *vesicular;* the vesicle presenting an *umbilicated* form, and attaining perfection on the last of these days; the eighth day, moreover, is the period of the first phasis of areola, when the vesicle represents the "true pearl upon the rose;" the ninth, tenth, and eleventh days are *pustular*, the lymph becomes purulent, the umbilicated form is lost, the areola enlarges, and constitutional fever is established; the twelfth, thirteenth, and fourteenth days are those of *desiccation;* the fifteenth, sixteenth, and seventeenth, of *separation;* and these latter are succeeded by the fall of the scab.

Such is the course of the vesicle of vaccinia, which is considered necessary to the protection of the system. When its progress is irregular, and its development not perfectly effected, the constitution remains in the same state in relation to the occurrence of variolous contagion as before the operation. It must be borne in mind, however, that the local affection is never so well marked in the adult as in the child, although the extension of inflammation to the neighboring glands and the constitutional fever are often greater.

The proper time for the performance of vaccination is infancy, between the third and the seventh month. At an earlier or a later period, the diseases incidental to childhood may interfere with the progress of the case. Jenner pointed out the fact that certain diseases of the skin, particularly those of a vesicular kind, interfere with the proper development of the vesicle, and other influences are derived from age or idiosyncrasy.

The constitutional symptoms accompanying vaccination are always slight, and often scarcely perceptible. In some instances, however, a little fever is observed at about the eighth and three following days, this febrile reaction corresponding with the progress of inflammation of the areola.

SECONDARY ERUPTIONS OF VACCINIA.

Syn. *Vaccinella.*

The general effects of vaccination occasionally offer some peculiarities. Thus, it sometimes happens, that, during the course of the vaccine pock, an eruption of vesicles appears upon the skin. Such an eruption lately fell under my observation in which vesicles and

bullæ[1] were developed upon inflamed patches on the greater part of the surface of the body. The principal features of this case were the following:

Green, a child eighteen months old, was vaccinated at the London Small-pox Hospital, on Monday, June 7th, 1841. On the ninth or tenth day after the operation an eruption of red spots was perceived upon the forehead, which quickly extended to the face, neck, trunk, and arms, and by the thirteenth day was dispersed over the whole of these regions, the redness being augmented towards evening and during the night. On the sixteenth day I first saw the patient; the vaccine crust and areola were natural, the eruption had subsided on the face, and was now principally confined to the arms, chest, and back, the legs being nearly free. In these situations it existed in its successive stages; there were small red spots, the earliest form of the affection, and larger patches, of a roundish or irregular form, of about the size of a fourpenny piece, several of these latter patches being congregated here and there, so as to form clusters of considerable size. The margins of the patches were of a dull red color, and somewhat elevated, while the centres presented a yellowish tinge, and in some situations were covered with numerous small vesicles, containing a limpid and transparent serum. On the eighteenth day, the redness of the patches was declining, their raised border had become lighter in tint than the centre, and the epidermis was desquamating over their surface, particularly on those patches where vesicles had existed. On the face the vesicles terminated in thin, brownish, and spongy laminæ. I inoculated a healthy child with lymph taken from these vesicles, but without any result.

In the early part of the present year I had an opportunity, through the courtesy of Dr. John Hall Davis, of seeing an infant in whom the secondary eruption of vaccinia was so severe as to be the cause of death. The eruption commenced upon the head and face, and thence extended to the neck and chest. On the latter there were more than one hundred vesicles, presenting the characteristic flattened and umbilicated form of the vaccine pock. They were for the most part discrete, but every here and there were confluent clusters of three, four, and five. On the neck the vesicles were confluent, the slight and irregular intervals of skin between the large patches were vividly red, and the whole surface poured out an abundant ichorous discharge. The child had evinced a tendency to eczematous eruptions from its birth; a circumstance deserving the attention of the medical practitioner.

The following case occurs in the *Archives de Médecine* for September, 1841. An infant a week old was vaccinated July 3d; on the 10th several papulæ appeared on various parts of the body. On the 15th there were eleven umbilicated vesicles on the abdomen and legs similar to those of vaccinia. Three children inoculated with lymph from this eruption had vesicles developed identical with those of ordinary vaccinia.

[1] Mr. Ceeley regards this eruption of a pemphigoid character as "strictly a vaccine eruption;" he has seen it frequently on children, and occasionally on the cow and dog.

Dr. George Gregory lately communicated to the Royal Medical and Chirurgical Society the case of a child in whom petechiæ appeared upon the skin four days after vaccination. The child was to all appearance in perfect health. The areola was occupied on the eighth day by an extensive ecchymosis, and the body was covered with petechial spots. By the sixteenth day, the petechiæ had commenced to fade. Five children of the same family were vaccinated at the same time, and with the same lymph, and went regularly through the disease. Dr. Gregory regarded this case as one of petechial cow-pox, in which the influence of the vaccine virus in the production of an hemorrhagic state of the system was demonstrated. Petechial cow-pox is rare; Dr. Gregory had never before seen a similar case, and had only heard of two of the same kind.

PROTECTIVE POWER OF VACCINATION.

I now come to a question of the utmost importance, namely, the efficacy of vaccination as a protection against small-pox. But before I engage in this discussion, it may be necessary to define precisely the meaning which I attach to the term vaccination. Vaccination I conceive to mean—

1. That the lymph employed in the operation is pure.
2. That it has been obtained from a vesicle which has passed regularly through the course described in the preceding section.
3. That it has been procured from the vaccine vesicle, between the sixth and eighth day of its course.
4. That the vesicle produced by this lymph in the vaccinated subject shall have passed regularly through the stages known as the natural course of the vaccine pock, and described in the preceding section (page 494).
5. That at least one of the vesicles produced by vaccination shall have been permitted to remain unbroken and uninjured, until the natural vaccine crust shall have been formed, and shall have fallen in the natural course.
6. That the cicatrix shall be well marked, and permanent, perhaps, also, foveolated.

When the whole of these conditions are complete, vaccination is perfect and the person so vaccinated may be regarded as protected against small-pox. But if any of these conditions be incomplete, it would be monstrous to expect that the full influence of the vaccine protection could be exerted. Again, it has been observed, that the nearer the approach of the conditions to the standard above established, the more protective will be the influence effected by the operation, and vice versâ.

The purity of the vaccine lymph is a point of the first consequence. The genuine lymph appears to undergo no change or loss of power by indefinite transmission, provided always that due attention has been directed to the fact of its being always obtained at the requisite period, and from a vesicle which has passed regularly through its course, in fact, from the true "pearl upon the rose." But

as the attention necessary for the assurance of this condition has, unfortunately, in many cases, been omitted, much spurious lymph has been mingled with that derived from the original source, and as a consequence, small-pox after vaccination has become more frequent, and vaccination has fallen into disrepute. It would, however, be unjust and unphilosophical, to attribute this apparent falling off in the influence of the vaccine lymph to any but its true cause, the one just mentioned.

On this topic I was much gratified by a recent conversation with Mr. Marson, the resident surgeon and vaccinator of the London Small-pox Hospital. He informed me that when, in 1835, he became attached to the hospital, he found in use a lymph which had been employed there for nearly forty years, and which had become greatly enfeebled in its powers. Two years afterwards, namely, in March, 1837, he fortunately met by accident with some new lymph of a very superior kind to his own, and possessing more active properties. That lymph he has continued to use until the present time (1856), and without injury to its powers, although during the intervening period he has vaccinated nearly 50,000 children, and distributed lymph to nearly 25,000 medical men.

The period best suited for obtaining the vaccine lymph is the *seventh day* of the vesicle, which corresponds with the eighth day of the operation; Jenner says between the fifth and eighth day, which is too indefinite.[1] If the vesicle appear incomplete on the seventh day, the removal of lymph might be deferred for a day, but it is important to obtain it before the inflamed areola is formed. After the areola is established, the lymph becomes altered in its character, and purulent, and either loses the power of exciting a pock, or produces one which is irregular in its appearance or course, and is incapable of conferring safety on the person vaccinated. It is true, that occasionally the fallen crust is sufficiently impregnated with the desiccated lymph to possess the power of exciting the disease, and is sometimes used as a convenient means of transporting the virus to warm climates; but the crusts for this purpose must be selected with care, and even then are liable to failure.

That the vaccine pock shall pass regularly through its course is the most important of all the conditions requisite for the success of vaccination. Jenner especially pointed out the necessity of this rule, for he perceived that its neglect might lead to the most serious results. That neglect has, I fear, very extensively existed, and many of the distressing consequences under which we now suffer are referable to it. The fulfilment of this condition is in itself the best assurance of the purity of the lymph, of the disposition of the system to receive its influence, and of the completion of the subsequent conditions.[2]

[1] Mr. Marson requires the vaccinated children to be brought back to him on the day-week of their vaccination; consequently on the completion of the seventh day and dawn of the eighth; the lymph is therefore seventh-day lymph. On this day he generally finds the lymph fit for removal.

[2] It may not be out of place here to remind the vaccinator of the importance of

When the vesicle passes regularly through its stages, the cicatrix which it leaves behind is strikingly characteristic, and may be depended upon as a proof of successful vaccination. But the absence of the foveolated appearance of the cicatrix is no proof that the preservative influence of vaccination has not been established, provided that a permanent cicatrix of the ordinary size be present. But when there is difficulty in discovering the cicatrix, or the latter is small, it may be unhesitatingly concluded that the pock did not complete its necessary stages, and, consequently, that the person is still unprotected.

VACCINATION TESTS.

With the view to ascertain whether vaccination has been effective, several plans have been adopted which are termed tests. The most efficient of these is inoculating with small-pox after vaccination; revaccination is a second test; and a third is that described by Dr. Bryce, of Edinburgh. Bryce's test consists in revaccinating a few days after the first vaccination. In this case, if the constitution be already affected by the vaccine influence, the second pock hurries through its stages, and speedily reaches an equal development with the first, arriving at its acme at the same time, and desiccating and forming its crust contemporaneously with its predecessor.

RE-ESTABLISHMENT OF THE PROTECTIVE INFLUENCE OF VACCINIA.

For several years past opinion has been divided relative to the protective influence of vaccination against small-pox. By some it is believed that the power of vaccination as a defence against variola diminishes gradually with the advance of age; and by others, it is thought that the vaccine virus introduced by Jenner has degenerated during the sixty-six years that it has been transmitted through the human race, and lost a portion of its protective quality. I shall not stop to inquire into the merits of these two questions, both warmly contested and supported by powerful advocates, but at once proceed to examine the propositions that have been made and acted upon for the purpose of supplying a remedy against the evil consequences which they would imply. As a means of perpetuating the vaccine influence, two modes of procedure have been recommended, namely, revaccination, and variolation after vaccination. And with the view to meet the second evil, three plans have been adopted, namely, retro-vaccination, variolo-vaccination, and recurrence to the primary lymph from the cow.

being very particular with regard to the purity of the instrument used in performing the operation, and indeed of the necessity for nicety and care throughout the entire process. I was lately called upon to give my opinion in the Coroner's Court, upon a case of death which had resulted from vaccination. Another child, vaccinated at the same time, had narrowly escaped the effects of inflammation of the absorbents and suppuration of glands; and there was every reason to fear that these dreadful consequences resulted from an impure lancet.

REVACCINATION.

The phenomena of contagion, as it affects the human frame, develop two important facts: *firstly*, that the workings of contagion in the animal organism destroy the susceptibility of that organism to take on a similar action; *secondly*, that from the moment of completion of the workings of contagion, the organism becomes gradually and slowly restored to the condition which it possessed previously to the development of contagion. In the abstract, these propositions are incontrovertible, but they require the modification implied in the estimate of time, to render them applicable to the thousand peculiarities that occur in daily practice. Thus, in relation to the first, we have to inquire, For what length of time the susceptibility is destroyed? and in relation to the second, At what period after contagion is the restoration of the organism so far effected, that a second attack of contagious disease may take place? To both these questions the answer is, *We know not.* All that we can venture to affirm with regard to them is, that, in one person, a single attack of contagious disease appears to be protective of the individual for life; while, in another person, a second attack may occur in a short period, the precise limits of that period not being correctly established. The determination of the shortest period at which contagious disease may resume its influence over the system is a point of much importance, and one of legitimate investigation. It is in the field of numerical medicine alone that we must look for a solution of the questions which are now proposed.

The reasoning, which is here directed to contagion in general, applies with particular force to the protective influence of the contagion of small-pox. A single attack of small-pox would appear, in the majority of cases, to protect the individual for the rest of life, but in a smaller number of instances, the variolous constitution is still active, and a second, a third, and even more attacks may be experienced. Now, that which is true with regard to variola, is equally true with regard to vaccinia; for variola and vaccinia are, in their essential nature, one and the same disease.[1] Again, it is admitted at all hands, that severity in the manifestation of the variolous disease affords no security to the system greater than that to be derived from the mildest form; and as vaccinia is variola in the mildest shape in which it can be presented to the human organism, the question of revaccination resolves itself into the propositions stated above.

If we admit that vaccination, although perfectly protective of the constitution against the recurrence of the small-pox contagion for an unknown, and probably variable space of time, ultimately loses its powers; and if, in the next place, we inquire what means present themselves of perpetuating its protective influence, the most natural and rational method that suggests itself to our mind is revaccination.

[1] It is proper to mention, in this place, that many opinions are opposed to this belief. Dr. Robert Williams observes, "Vaccinia is a disease *sui generis*;" and further on he remarks, "It is likewise by no means proved, that the small-pox and the cow-pox are identically diseases of the same species."—Vol. ii., p. 49. Elements of Medicine.

Revaccination, or a repetition of vaccination, is a simple and harmless operation, producing a mild and trifling indisposition when the system is unprotected, but no effect whatsoever when the organism is safe. Here, then, we find the operation to be acting as a test of the safety of the individual, and no objection can possibly be raised against its use. If the organism be safe, it produces no effects; if the organism be unsafe, it produces a trifling inconvenience, but it leaves a bulwark of safety in its train.

The only question that remains to be considered in relation to revaccination, bears reference to the periods at which the operation should be performed. This is a matter of trivial importance in comparison with the principle which it involves. I would say, let vaccination be performed every five years, or every seven years, or every ten years. But, as our object is protection, let us not defer that protection too long. If the operation succeed at the end of five years, that fact affords the strongest proof that the repetition is not too frequent. If it fail at the end of five years, let it be practised at seven; if it fail at seven, make a third attempt at ten; if the operation fail then, it may be adopted at successive intervals, but the person inoculated has the satisfaction of knowing himself safe, at a most insignificant inconvenience.

Numerous cases have been adduced in which an attack of small-pox has followed vaccination.[1] I care not to inquire if vaccination have

[1] It must not be imagined that Jenner ever contemplated an infallible remedy in vaccination; he merely expressed his belief that vaccination would be found to protect the organism in an equal, if not in a greater degree, than variola, and with a prodigious saving of suffering and danger. In respect of this expectation, Dr. Robert Williams remarks, that it "has not altogether been verified, the evidence at present accumulated showing the attack of the latter (secondary small-pox) to be only in the ratio of a half to one per cent., while the attacks of the former (small-pox after vaccination) are not less than five per cent, or from five to ten times greater. It is enough of glory, however, to the discoverer of vaccination, and of honest pride to the profession who have adopted it, to be able to state, that by the discontinuance of the practice of inoculation, the total number of persons attacked by natural small-pox in this country, taking the most unfavorable calculation, is reduced one-half, or probably from 260,000 annually, to about 130,000 annually, while the number of deaths have been reduced in a still greater ratio, or from 60,000 to about 11,000; also, that the accidents incident to the disease, as blindness, deafness, lameness, and the endless catalogue of miseries that follow it, are also reduced almost to nothing. This result is that of England and Wales generally, and it is still capable of being very greatly reduced, for among the better protected class of persons, as the army, only one soldier has been attacked by small-pox in every two thousand, annually; so that taking the army at 100,000 men, the mortality is only four from small-pox in the whole of that large force annually. The navy appears also to experience a similar immunity, for out of a mean strength of 7958 seamen, seven only died, in seven years, of small-pox in the Mediterranean and Peninsular commands, while, in the West Indian and North and South American commands, none whatever. On the Continent, also, where the governments are awakened to the great truth that the health and industry of the lower orders form the surest basis of national wealth and greatness, and where vaccination is consequently made of national importance in the matter of legislation, we find that the mortality from small-pox, though greater than in our army, is infinitely less than in England and Wales generally. In Prussia, for example, according to the table given by Hoffman, on an average of a million of deaths, only 8191 were caused by small-pox, or one in 122. In England and Wales, however, out of 141,607 deaths, 5811 were occasioned by small-pox, or one in 25, nearly; thus showing that the country which gave birth to vaccination, suffers six times more by small-pox than that of its wiser and more considerate neighbor."—(P. 49.)

been perfect in those cases, for instances are equally numerous in which small-pox has followed inoculation, and small-pox itself, both discrete and confluent. These facts prove nothing unfavorable to the claims of vaccination as a protective agent against small-pox; they prove only that which daily experience tends constantly to corroborate, namely, that MAN HAS STILL MUCH TO LEARN. There can be no question that instances of variolous constitution exist in which all preventive means that we can suggest would be utterly futile, but these are, happily, exceptional cases. We are, I fear, completely ignorant of the laws which govern contagious disorders. It has been observed that rubeola and scarlatina, like variola, occur but once in the lifetime; persons having once suffered from these diseases consider themselves secure from infection, and yet how frequently we have occasion to see the rule nullified, and secondary attacks developed. The following table, quoted from Dr. Heim, in the Report of the Vaccination Section of the Provincial Medical Association, is exceedingly interesting, as showing the relative frequency of success in vaccinating after small-pox and after vaccination:

Vaccinated after small-pox	with success,	32
"	" modified,	26
"	" without effect,	42
		—100
Revaccinated with success,		34
"	" modified,	25
"	" without effect,	41
		—100

Revaccination is at present being performed very extensively on the Continent, which would seem to imply distrust in the powers of the primary vaccination. The results of these operations, however, are calculated to increase our knowledge upon this important subject.

The following are the conclusions of the Commission of Vaccine, on vaccination performed in France, during the year 1839:

1. That the simultaneous vaccination of the mass instantly arrests the progress of the variolous epidemic.

2. That if vaccinia be not an absolute and infallible preservative against variola, it is at least the most certain, and the most exempt from danger.

3. That varioloid, in the majority of cases, is the only inconvenience to which the vaccinated are exposed.

4. That there seems no reason for the belief that the long vaccinated are not as surely preserved at the present day as they have hitherto been; nor that the recently vaccinated have received less security than those who preceded them.

5. That the complete success of revaccination affords no proof that the individual had ceased to be protected by vaccination, and that he had again become susceptible of variola.

6. That a second vaccination does not appear to possess the power, any more than the first, of protecting all persons indiscriminately from the risk of a future attack of variola.

7. The Government ought not to command a general revaccination.

8. That the total extinction of variola is to be effected by the universal adoption of vaccination.

VARIOLATION AFTER VACCINATION.

Inoculation after vaccination has been proposed as an additional security against the contagion of small-pox. To those who regard vaccinia and variola as different diseases, such a suggestion is likely to be received with approbation; but if we view these disorders in their true light, namely, as one and the same affection, inoculation after vaccination is but a repetition of revaccination, and is, consequently, incapable of bestowing any superior advantage.

RETRO-VACCINATION.

This operation is attended with some difficulty, in consequence of the indisposition evinced by the assimilative powers of one group of animals to the reception of virus derived from a different order. The operation has, however, succeeded several times in the hands of Mr. Ceeley, and its results are conclusive. This gentleman observed a slight increase in the frequency of the pulse of the animal as soon as the inoculation had taken effect, and the local affection was attended with a moderate degree of inflammation. The vesicles were produced late, and good lymph was procured on the tenth day.

When children were vaccinated with this retro-vaccine lymph, the development of the pock was found to be retarded, the papular stage was not established until the sixth or seventh day, the areola was complete on the tenth or twelfth day, and declined during the two following days. The vesicles, in some instances, were smaller or less firm than usual. With these exceptions, no difference could be detected between the retro-vaccine and the ordinary current lymph, and these differences were entirely lost after three removes in the human subject. From these experiments, I think it may justly be inferred, that for the purpose of improving the vaccine lymph, retro-vaccination, or passing it again through the cow, is useless.

VARIOLO-VACCINATION.

Inoculation with the variolo-vaccine lymph is attended with the same difficulties of transmission as are common in the case of unassimilated virus. Out of twenty punctures inoculated with lymph derived from the variolo-vaccine vesicle, Mr. Ceeley obtained only six vesicles. These, when they appeared, were characterized by their early inflammation, and by tardiness and irregularity in progress and development. The secondary fever, which arose and subsided with the areola, was severe, and if the vesicle were ruptured, ulceration and sloughing were liable to ensue. The effects of this lymph are illustrated in the following successful case: "Emma Jacock, aged fourteen, dark, swarthy complexion, thin skin, rather florid; two points of sixth-day lymph, and four of eighth-day lymph, were inserted into six punctures; on the fifth day, four of the papulæ had ash-

colored summits, and seemed vesicular, two were doubtful. On the seventh day, there were five small, distinct, reddish-gray, or ash-colored vesicles, one very small. On the eighth day, the vesicles were advancing, of unequal size, and of irregular form. Here I was forcibly struck with the strong resemblance some of these vesicles bore to those of the eighth day, depicted in Jenner's work, on the arm of Hannah Excell, which he thought so remarkably like the results of small-pox inoculation. My patient stated that she felt slightly indisposed on the fifth and sixth days, that the axilla was painful on the seventh day, and that she was then giddy and sick, but felt worse on this the eighth day. On the ninth day the areola commenced, and she complained only of headache. On the eleventh day it was fully developed, when all her symptoms returned in an aggravated form. On the twelfth day it declined; but the turgid vesicles having burst the flimsy cuticle, renewed inflammation and induration, with circumscribed sloughing and ulceration of the skin, ensued, and rather deep scars are now visible."

After narrating the results of several successive removes of the variolo-vaccine lymph, Mr. Ceeley remarks, "Nothing could be more satisfactory or gratifying than the progress now made, which it would be needless further to detail; I shall therefore abstain from the description of individual cases, after adducing one example from the fourteenth remove, as a type of what might be produced in similar subjects, namely, an infant fourteen months old, florid, plump, and healthy, with a fine, clear, thick, smooth skin.

"In the majority of instances, in propagating from arm to arm, distinct papulation was apparent on the second day; on the third it was not only visible but elevated and well-defined; on the fifth and sixth, vesiculation was abundantly obvious, and lymph was often taken on those days. On the seventh day vaccination was frequently performed, and points were often charged; on the eighth the vesicle commonly exhibited a bold, firm, and glistening aspect; between this period and the ninth day the areola generally commenced (but in young infants with tense and sanguine skins, it appeared early on the eighth); by the tenth day the vesicle was commonly in its greatest beauty and highest brilliancy, glistening with the lustre of silver or pearl, having the translucency and appearance of crystal, or shining with a pale blue tint, occasionally of a dull white or cream color, bold and elevated, with a narrow centre and a broad margin, or flat and broad in the centre, with an acute margin, occasionally not raised above the level of the skin; on this and the eleventh day an extended and generally vivid areola existed, with more or less tension and induration of the integuments. At this time the lymph was frequently pellucid, and often perfectly efficient. From the eleventh to the thirteenth day gradually increasing in many individuals, both children and adults, sometimes the entire vesicle, at other times only the central parts, reflected a blue or slate-colored lymph, from the congested or ecchymosed subjacent adventitious structures, proportioned to the texture and degree of translucency yielded by its desiccating epidermis. On the thirteenth and fourteenth day, particularly on clear skins mode-

rately thick, the vesicles attained a considerable size, measuring often in their longest diameter six and a half or seven lines, and acquired a light brown centre, from commencing desiccation, which was surrounded with an outer margin of dull white, or pale dirty yellow, soft and flaccid, and still possessing fluid contents. During this period the areola, of a dull red or damask hue, would revive, and decline again and again, and even to the sixteenth or eighteenth day, the period to which complete desiccation was frequently protracted. The crust commonly partook of the form of the vesicle; it was often prominent and bold, varying in color from that of a chestnut to that of a tamarind stone. It fell generally about the twenty-third or twenty-fifth day, often later."

"The cicatrices were of variable depth and extent. When the vesicles remained unbroken on a thick sanguine skin, they were deep, but on a thin skin, shallow; they were not always proportioned in width to that of the vesicle, the smallest cicatrix often succeeding the largest vesicle, but the later the crust fell, of course the deeper the cicatrix, which, on these occasions, was often beautifully striated. I need scarcely say, that where the vesicles were accidentally broken, or spontaneously burst, much mischief ensued, deep sloughing of the skin, &c. Spontaneous bursting did not often occur, except in those subjects possessing the before-mentioned and well-known obnoxious constitutional endermic characteristics, upon whom we must always use active lymph with some risk.

"When the lymph in the first remove produced normal vesicles, and as soon as it had passed readily from arm to arm, the constitutional symptoms, though mild, were most commonly well marked. In infants, restlessness, fretfulness, and inappetency about the fifth or sixth day were very common, sometimes as late as the seventh day. Very few escaped feverish symptoms on the ninth and tenth days, many had vomiting and diarrhœa. From childhood up to puberty the primary symptoms from the fifth to the seventh day were unequivocally visible, and often complained of; fever, vomiting, delirium, and diarrhœa were not unfrequently witnessed at the commencement, or during the progress of the secondary symptoms. In adults, of course, more complaint was made, headache, chilliness, anorexia, and sometimes thirst, on the fifth or sixth day; increased on the seventh day, with axillary tenderness; but on the ninth and tenth days much general febrile complaint, disinclination, and even inability, to leave the bed. But in several instances, amongst young children, little or no complaint was made or indicated; all the members of the same family, vaccinated from the same source, might be differently affected. One, for instance, would not cease from pastime, occupation, or meals, while another, particularly if older, would be indisposed several days. Neither the number nor the magnitude of the vesicles seemed to determine the amount of the primary disturbance. If properly developed, small vesicles often gave rise to marked constitutional symptoms, and the most splendid vesicles were often seen with trivial, sometimes scarcely appreciable disturbance."

"The secondary symptoms are often as active with three or four,

as with six or eight vesicles; acceleration of the pulse was frequently noticed, when no other symptoms appeared. Both primary and secondary symptoms very commonly showed a remitting type."

With respect to cutaneous eruptions, Mr. Ceeley observed but one in the adult, and in children nothing approaching the varioloid character. "Roseola, strophulus, lichen, were the principal eruptions."

Dr. Basile Thiele,[1] of Kasan, has succeeded several times in inoculating the udder of cows. When children were inoculated with matter taken from these pocks, the effects produced were more intense than those occasioned by the ordinary vaccine lymph. In some cases, Dr. Thiele observed two febrile attacks, one between the third and fourth day, the other between the eleventh and fourteenth, and these severe consequences were not lost until the sixth remove. In one case, he produced true variola, and inoculation with the matter of these pocks gave him vaccinia.

RECURRENCE TO THE PRIMARY VACCINE VESICLE.

Lymph has been procured directly from the cow in several counties of England, and numerous children have been inoculated with this primary lymph; indeed, the removes from these sources have now come into almost general use. The gentlemen to whom we are principally indebted for this supply are, Mr. Estlin, of Gloucestershire; Mr. Fox and Mr. Sweeting, of Dorsetshire; and Mr. Ceeley, of Buckinghamshire. It has also been obtained and employed in France, by M. Saunoy.

Whenever an attempt is made to inoculate man with the virus derived directly from the cow, or, on the other hand, to inoculate the cow with humanized vaccine lymph, or with small-pox, great difficulty is encountered. There would seem to exist an indisposition to the assimilation of virus derived from an animal of a different order, but when this lymph has once become assimilated, all difficulty is at an end. When inoculation is effected, a remarkable difference is perceived in the consequences of the two kinds of lymph; thus, in the transference of the lymph of small-pox to the cow, the virus is greatly modified, and the resulting pock is chastened and mild; while, on the contrary, the lymph of the variolæ vaccinæ first introduced into the tissues of man, gives rise to symptoms of greater severity than those produced by humanized lymph. How far this difference of effect may be dependent upon the different quality of the fluids of an herbivorous and a carnivorous (the human infant) or semi-carnivorous animal, I am unprepared to say. I think it not improbable that the cause might be found in this difference of character.

The effects of vaccination with primary lymph are, according to Mr. Ceeley, as follows: On the second day after vaccination there is an unusual degree of redness around the puncture; the redness declines on the two following days, and becomes concentrated in the point where the papula arises. The elevation of the papula com-

[1] Bulletin de l'Académie Roy. de Méd., Jan., 1841.

mences on any one of the days between the sixth and the tenth. Desiccation of the vesicle is also protracted; it contains fluid until the sixteenth or eighteenth day, and the crust remains adherent until the end of the fourth or fifth week. The areola is completed from the eleventh to the sixteenth day, and is sometimes covered with small supernumerary vesicles, and accompanied by a general eruption of papulæ, vesicles, or bullæ. When the vesicle is ruptured in unfavorable constitutions, irritable sloughing sores are sometimes formed, and the fall of the crust is occasionally succeeded by a yellow, foul excoriation.

The vesicles produced by primary lymph are very variable in appearance, sometimes they are "remarkably large, and finely developed," at other times they are smaller, and "less developed than other vesicles;" but they "admit of a very remarkable improvement, by transmission of the lymph through a series of well-selected subjects. By this process, also, in a very short time, most of the defects and some of the evils connected with the use of primary lymph may be dissipated, and the lymph rendered milder, and more suited to general purposes." "Children are the best, certainly, for the purpose, and such should be selected as possess a thick, smooth, clear skin, and have a dark complexion, and are not too florid, but still, plump, active, and healthy." "By a steady and judicious selection of these, and similar subjects, in a few (even three or four) removes, the severity of the local mischief becomes manifestly materially diminished, the vesicles acquire a magnitude and beauty, often greatly superior to what is daily witnessed; and in a short time the lymph may be transferred with safety to others, even more sanguine and robust, where, it is well known, lymph, if good for anything, will produce the finest and most perfect vesicles." "As we advance, we find the necessity of preparing the most objectionable subjects, and the advantage of subjecting many of them to the same preliminary treatment, which the best and most expert inoculators of small-pox formerly so successfully adopted for their patients; for it is a long time before some individuals can be safely vaccinated with this active lymph, even though taken from the mildest vesicle."

Recurrence to the primary lymph from the cow appears to me to be the only unobjectionable method of improving the current lymph, and correcting the deterioration which has arisen from neglect of the precepts of Jenner. Lymph from this source must necessarily be pure, and its use should therefore be encouraged.[1]

TREATMENT.—Any morbid conditions arising accidentally from

[1] Dr. Lichtenstein, in a paper entitled, "On the sources from which matter preservative against the small-pox has been derived," in Hufeland's Journal for 1841, remarks, that limpid lymph taken from the pustules produced by tartarized antimony, and inoculated in a person who has not been vaccinated, produces vesicles, which cannot be distinguished from those of vaccinia. These vesicles appear to be equally protective against small-pox with the cow-pox, and the matter may be transmitted from person to person in the same manner. The author of the paper has inoculated and reinoculated thirty-one persons with the matter procured from this source; and these persons were protected during an epidemic of small-pox, although placed in association with patients affected with that disease. Credat Judæus, non ego!

vaccination should be treated in accordance with the general principles of therapeutics. Febrile symptoms may call for the employment of antiphlogistic remedies; and the local dermatitis, when it assumes a form of unusual severity, may be subdued by means of a compress of linen wetted in a spirituous lotion and covered with oiled silk, or by means of a piece of Alison's prepared lambskin saturated in water. If sloughing or ulceration occur, water-dressing should be continued until the inflammation is removed, and slightly astringent washes or a mild ointment applied subsequently.

CHAPTER XVI.

DISEASES AFFECTING THE SPECIAL STRUCTURE OF THE SKIN.

DISEASES OF THE VASCULAR STRUCTURE.

THE disorders of the vascular structure of the skin are two in number, one affecting the cutaneous veins, and giving rise to enlargement of those vessels; the other affecting the capillary and arterial system, and producing tumors of various magnitude. These states are represented by the following terms:

Hypertrophia venarum.
Nævi vasculosi.

Hypertrophy of the veins of the skin, of its papillary and deeper layers, is an accidental affection occurring in the adult, or more commonly at an advanced period of life. Nævus vasculosus is generally congenital; but some of its minor forms, such as the nævus araneus, may be developed at any subsequent age.

HYPERTROPHIA VENARUM.

Hypertrophy of the veins of the skin occurs in two situations: on certain parts of the face, where it is the result of a defective tone of the tissues, or torpid action of the functions of the skin; or, on the limbs, particularly on the lower extremities, where it is commonly accompanied with a varicose state of the subcutaneous veins.

In the face, enlarged venules are most frequently seen on the nose, on the cheeks, and upon the chin. On the nose they are accompanied with a coarse state of the skin, and sometimes with actual hypertrophy of that organ. Occasionally I have seen them so large, and their presence has so retarded the circulation of blood in the organ, as to give a livid and swollen appearance to the extremity of the nose. In their more usual state, they are met with on the sides of the nose, where two or three, and sometimes as many as six, large trunks may be seen collecting their tributaries from the border of the ala, and

from the extremity of the organ. The trunks vary in length, from half to three-quarters of an inch, and sink into the depths of the skin above the alar cartilage to reach the mucous membrane. On the sides of the bridge of the nose, the enlarged venules sometimes constitute a plexus, as they do also on the cheeks. This state of the veins of the skin is simply one of enlargement or hypertrophy, dependent on vascular determination or congestion, and a subsequent torpid function of the part, and is unconnected with disease of the skin, or a special morbid state of the system. In this respect it differs from the venous plexus which is met with in patches of the skin, the seat of syphilitic tubercles, and also from the enlarged state of the venules of the skin, which is found in association with the non-ulcerating or superficially-ulcerating tubercles of lupus.

On the limbs, and particularly on the thighs, the enlarged venules are larger than those of the face, and more deeply imbedded in the skin, communicating, in fact, with the subcutaneous veins. They are sometimes straight, like the venules of the face, or disposed in a superficial plexus; but more frequently they form patches, which are uneven on the surface from the projection of the coils of the distended veins, of a purplish or bluish color, the tint of blue being greatest where the veins come nearest to the surface, and of considerable thickness, but at the same time very little elevated above the level of the surrounding skin. They are, in fact, patches of *varicose venules*, and are usually associated with a varicose state of the subcutaneous and deeper veins.

TREATMENT.—My practice in the treatment of enlarged venules of the nose and face is to touch the trunks with a fine point of potassa fusa, taking care to carry the point down to the vessels, so as to produce coagulation of the contained blood. This little operation requires care, in order to render as small as possible the pitted cicatrix which is apt to follow. When the hypertrophia venarum is spread more or less extensively over the face, it is necessary to improve the tone and nutritive functions of the skin by means of the stimulant and astringent action of the bichloride of mercury lotion, or by the more general stimulation of the compound hypochloride of sulphur or juniper tar ointment.

For the *varicose venules* of the lower limbs, the only efficient treatment is, continued pressure, for which purpose the mercurial plaster spread on wash-leather, and a bandage, are best suited. These cases, however, from the nature of their cause, are less remediable than hypertrophous venules occasioned by altered nutrition and innervation of the affected part.

Even in this slight affection it is necessary to improve the vital functions, and depurate and invigorate the blood by constitutional means. Very few cases will be found in which *elimination* and *restoration of power* are not needful.

NÆVI VASCULOSI.

Syn. *Teleangiectasia. Vascular nævus. Erectile tumors. Arterial nævi. Venous nævi. Nævus araneus. Nævus flammeus. Gefässmuttermäler*, Germ. *Signes; Taches de vin*, Fran. *Mother's marks.*

The vascular rete of the derma is liable to become dilated, and to give rise to the formation of red patches and slightly elevated tumors, called *vascular nævi.* Vascular nævi present considerable variety in relation to extent, tint of color, and tumefaction. Occasionally, the vascular dilatation is limited to a mere point, from which several enlarged venules pass off in different directions. This kind of nævus rarely increases in size; it is met with on the face and limbs, and from the peculiarity of its appearance has been named *nævus araneus.* Proceeding upwards from this nævus araneus, the diseased spots may be found to present every degree of size, and their dimensions are frequently so large that they have been seen to cover the whole of one side of the face, the ear, and part of the scalp. The tint of color of vascular nævi is dependent on two conditions, the extent of dilatation of the capillary rete, and the degree of excitation of the vascular system. Thus, if the capillaries be only moderately dilated, so as to offer little impediment to the circulation, and the latter be active, the blood will retain its arterial hue, and the color of the nævus be brightly and vividly red. If, on the contrary, the vascular rete be dilated in a high degree, the blood will travel slowly through the tortuous tubes, and, assuming its venous character, the nævus will present a purple, and even a livid hue. Intermediate degrees of dilatation or impediment to the circulation, will naturally produce different tints of red. Similar changes of color are apparent in the same nævus, under different degrees of excitation of the vascular system. Thus, in a state of repose of the individual, the spot may be only moderately colored and livid, while, in a state of temporary excitement, the spot will assume a most intense and vivid red. The circumstances which affect the color, modify also the degree of tumefaction. In a state of repose it is ordinarily flaccid, and probably scarcely raised above the surface; but in a state of excitement of the circulation, it will become tense and tumid. In relation to tumidity, as great variety is met with among nævi as is found in their other characters. Some are not perceptibly raised above the level of the surrounding skin, while others form prominent tumors.

Vascular nævi, when of small size, give rise to little or no inconvenience; but when large, they are hot, painful, and throbbing. In the latter state they communicate a distinct pulsation to the finger, synchronous with that of the heart's beat. Vascular nævi are sometimes stationary, but more frequently they increase slowly in size by the gradual extension of the morbid state of the capillary rete to the vessels of adjacent parts. Their growth is not always limited to the skin, for they are apt sometimes to extend more or less deeply into the subcutaneous tissues. Left to themselves, they will often continue the whole of life, without giving rise to any inconvenience; at other

times they may ulcerate and slough, or throw out a fungous growth, this change being accompanied by repeated hemorrhage, and terminating fatally. At all times the hemorrhage is troublesome, and even dangerous, when vascular nævi are accidentally wounded.

Dupuytren has the merit of first pointing out the analogy of structure of vascular nævi with the erectile tissue, and since the announcement of this similarity, they have been commonly termed, *erectile tumors*. These nævi have been described from the earliest times as mother's marks, and have been referred to the influence of moral emotion on the part of the mother during pregnancy. In pursuance of this explanation, we still hear them spoken of, in popular language, as bunches of red and black currants, strawberries, raspberries, blackberries, lobsters, &c., and it is supposed that the mother, in these cases, had a particular longing for the object represented.

From the above description it will be seen that all vascular nævi are identical in structure, and that differences, when they exist, are referable to more or less dilatation of the vascular rete. Where the rete is dilated to a moderate extent, and the color of the nævi is brightly red, we may call them, for the sake of distinction, *arterial nævi;* and where the capillary rete is very much dilated, and the color is blue or livid, we may call them *venous nævi.* The term varicose nævi has been sometimes applied to the latter; but the use of this term is objectionable, for two reasons: in the first place, it would seem to indicate a difference of structure, which does not exist; and, in the second place, the term is wanted for those bluish subcutaneous enlargements which consist of a plexus of small varicose veins, and are so frequently associated with varix of larger veins.

As far as my observations have gone, and I have dissected many vascular nævi, there is no addition to the normal number of capillary vessels in the affected part. They are enlarged in calibre, with corresponding hypertrophy of their coats, with enlargement of their meshes, with hypertrophy of the intervascular tissue, and dilatation of their appertaining arterial and venous trunks.

Treatment.—When the nævus is of large size, gives rise to little inconvenience, and advances but tardily in its growth, it had better be left alone, or simply treated with cold and styptic applications, with moderate pressure. When, however, these conditions are reversed, an attempt may be made to destroy it, bit by bit, by pencilling a small portion of its surface, from time to time, with nitric acid. In this way, in the course of time, a nævus of large size may be cured.

When the nævus is small, it may be removed by excision, or if it be of moderate size, and danger be anticipated from division of the arteries which supply its base, it may be dislodged by the operation proposed by Mr. Liston, which combines with incision the use of ligatures passed through its base, and firmly tied. This plan has the advantage over all others of getting rid of the morbid structure expeditiously, without the chance of hemorrhage. In certain cases, the ligature passed through the base of the nævus may be used without the incision; if the nævus be extensive or elongated, several ligatures may be required; and in some situations it may be desirable

to leave needles in the base of the tumor, and fasten the ligature beneath them; where the tumor is pedunculated, a simple circular ligature may employed.

The spider nævi, and those of very small size, may generally be cured by introducing into them a point of potassa fusa; while, in some instances, touching the exterior with the caustic will suffice for their destruction.

Dr. Marshall Hall proposes the breaking up of the vascular structure of nævus by means of a cataract needle with cutting edges, avoiding any external opening, save that through which the instrument has entered. Several instances are recorded in which the carotid artery has been tied for nævi of large extent.

In flat nævi, Dieffenbach recommends the use of a compress of lint to be firmly bandaged on the morbid structure, and frequently wetted with liquor plumbi diacetatis, or a solution of alum. The lint should be disturbed as little as possible, and the compression maintained, if necessary, for several weeks. When the nævus becomes white, flat, and firm, its speedy cure may be expected. This treatment is especially applicable to those cases where, from the extent of the disease, operative procedure is inapplicable. Dr. Behrend, of Berlin, prefers the application of strong acetic acid, followed by compresses soaked in vinegar. Under this treatment, the blood is made to coagulate in its vessels; the nævus becomes hard and yellow, and is thrown off in the form of a parchment-like layer by a process of exfoliation. Collodion is well suited to effect and assist compression; but to do any good, the compression must be continued for a considerable time.

Numerous methods besides the above have been suggested from time to time for the treatment of vascular nævi, such as exciting inflammation of the vascular growth by vaccination; applying potassa fusa; nitric acid; injecting them with dilute nitric acid; passing a seton through them; applying the actual cautery; quick-lime; tartarized antimony, &c.

At the present time I am interested in two cases of vascular nævi in children, which have been left alone, and are now undergoing spontaneous cure; and the observation of these cases has led me to believe that many of the vascular nævi of infancy would get well if left undisturbed. In one of these cases the nævus was round, as large as a small hazel-nut, and situated on the scalp, immediately over the anterior fontanelle. I intended to remove it by means of the crucial ligature applied around its base, but deferred the operation until the closure of the fontanelle should have advanced towards completion, inspecting it from time to time, lest any considerable increase of growth might render an earlier operation necessary. The nævus made its appearance immediately after birth, and the child is now nearly a year old. The tumor was vividly red, almost transparent, and apparently covered only by a thin cuticle. At my last inspection it was whitish, shrivelled, and the integument was considerably thickened; spontaneous cure was rapidly progressing. In the other case, the nævus was flat, and occupied the shoulder of the child, to the extent of nearly an inch square. The only remedy that suggested

itself was compression, or nitric acid; but nothing was done. It appeared at birth, and the child is now two years old; the vascular structure has become absorbed in various places; from being vividly red, the skin has recovered its whiter tint in several parts, but, on close inspection, has a disorganized appearance, somewhat like a cicatrix. The curative change is most active in the centre, and through one segment of the patch; the part still remaining active being a portion of the border.

CHAPTER XVII.

DISEASES AFFECTING THE SPECIAL STRUCTURE OF THE SKIN.

DISEASES OF THE NERVOUS STRUCTURE.

UNDER the influence of disordered nervous excitability, depending sometimes on constitutional and sometimes on local causes, the sensibility of the skin may be increased to a morbid extent, constituting *hyperæsthesia;* it may also be reduced in sensibility, constituting *anæsthesia;* or it may be morbidly altered as well as simply augmented, and give rise to a painful sensation of itching, to which the term *pruritus* has been applied. These disordered conditions of sensation are independent of any local disease of the skin, which retains its wonted appearance and structure.

HYPERÆSTHESIA.

Hyperæsthesia, or excessive sensibility of the skin, is more common in women than in men, and is generally referable to hysteria. In an instance of this disorder, at present under my care, the sensitiveness of the skin is so great that the slightest touch with the finger occasions pain; so far as sensibility is concerned, the patient is as though flayed, and utterly incapable of bearing the weight and pressure of her ordinary dress. For several weeks she was unable to lie down in bed, and at present, though much better, the jolting of a carriage occasions considerable suffering. In other respects her health is good, all the ordinary functions of life being performed regularly and properly. In this lady's case there is present a remarkable state of swelling of the skin, which comes and goes with the increase or diminution of its sensitiveness.

ANÆSTHESIA.

Anæsthesia, or deficient sensation of the skin, is best illustrated in those curious examples of cutaneous disease, namely, *morphœa alba*, which have been described under the head of Elephantiasis. In the

patches of morphœa alba there is a morbid change in the nervous fibrils, and not only the sensation but the nutrition of the skin suffers in consequence. Anæsthesia is also met with in a moderate degree in those round spots which form upon the scalp and chin, and cause destruction of the hair, namely, *alopecia areata*. The treatment of anæsthesia must be determined by the state of constitution of the patient, and by the disease with which it is associated.

PRURITUS.

Pruritus is sometimes *general*, but more frequently *local;* of the latter several forms deserve attention. These are—

Pruritus ani,
" scroti,
Pruritus pudendi.
Pruritus præputii,
" urethræ.

GENERAL PRURITUS.

In general pruritus the peripheral extremities of all the cutaneous nerves of the body are, in turn, the subject of altered sensation. The pruritus is excited by the most trivial causes, and continues unabated for hours, depriving the sufferer of every chance of comfort and repose. The only period of the day that persons affected with this distressing complaint can look forward to for an interval of quiet is the morning. As soon as they have taken dinner, or the most trifling stimulus, their worrying torment begins. Alteration of temperature has the same effect; they suffer immediately that they change their dress, and especially as soon as they experience the warmth of bed. Scratching, instead of relieving, serves only to augment the evil, and they are kept in a state of wretched discomfort and excitement during the greater part of the night, to forget their annoyance at last, only in a sleep made irresistible by absolute exhaustion.

It is interesting to remark the extent to which these painful sufferings are subject to the influence of the nervous system. So long as the mind is engrossed with agreeable occupation, or is diverted from the disorder, the morbid sensation sleeps; but the instant the thoughts are turned to the affection the pruritus is aroused, and rages with severity. The apprehension of an attack will, in this way, often excite it, and every effort for its relief will but prolong its continuance.

The attacks of general pruritus are variable in length of duration; sometimes they continue for hours without alleviation, while at others their periods are shorter, and broken by intervals of calm. The disorder may last for several months, and even for years.

General pruritus is usually the consequence of irritation of one or other of the mucous membranes of the body. In some instances, the gastro-intestinal mucous membrane is in fault; in others the pulmonary mucous membrane; and in others, again, the genito-urinary. The affection is sometimes associated with amenorrhœa, or dysmenorrhœa, and not unfrequently with pregnancy. In some

instances it is an attendant on jaundice, and is then attributed to the presence of bile in the blood.

PRURITUS ANI.

Pruritus ani is a severe and distressing itching of the mucous membrane of the verge of, and immediately within, the anus, and of the neighboring integument. The itching is greatest at night, commencing shortly after the sufferer has retired to bed, and continuing for several hours. There is no trace of morbid alteration of the skin, but sometimes the parts are excoriated by scratching, and a morbid secretion is poured out, which increases the irritation, and gives rise to erythema of the surrounding skin. Unless relieved by treatment, pruritus ani will continue for many months, and even for years.

The *causes* of pruritus ani are numerous, being partly referable to the state of the constitution, and partly to local irritation. Among those of the latter class are, ascarides, hemorrhoidal swellings, fistula, and chronic inflammation of the mucous membrane of the rectum. The general causes are, sedentary occupation, disordered health, heat of weather, irregularities of diet, cessation of catamenia, &c. Dr. Lettsom was of opinion, that in certain cases this disease acted as a useful counter-irritant, and he records several instances in which visceral and cerebral congestions were relieved by its attack.

PRURITUS SCROTI.

Pruritus scroti is identical in most respects with the preceding affection, and originates in similar causes. It is usually dependent upon the irritating effects of the lithic acid diathesis, upon the presence of ascarides in the rectum, or upon a morbid and irritating fluid secreted by the abraded skin. In attempts made to relieve the pruritus by scratching, painful excoriations are often produced. The back of the scrotum is most frequently affected.

PRURITUS PRÆPUTII.

This form of pruritus depends upon irritation, usually excited by morbid secretion from the mucous membrane of the prepuce. The disease originates in neglect, and may be relieved by attention to cleanliness and alkaline ablutions. It occurs, for the most part, in the summer season, and is very distressing whilst it continues.

PRURITUS URETHRÆ.

Pruritus urethralis occurs at the extremity and along the canal of the urethra in females, and gives rise to great discomfort and annoyance. This troublesome affection usually depends on some irritation of the mucous membrane of the bladder, and is analogous to the pruritus which is experienced at the meatus urinarius of the male in calculus of the bladder.

PRURITUS PUDENDI.

Pruritus pudendi is a most distressing affection. It invades chiefly the external labia and vulva, but sometimes extends inwards along the vagina, giving rise to excessive discomfort, and often exciting symptoms of nymphomania. The disease affects all ages: I have twice seen it in young children; more frequently it occurs at the period of puberty, or of the cessation of the catamenia. It is sometimes a very distressing accompaniment of pregnancy, invading at about the fourth month or after parturition. Among other causes which have been indicated as originating this disease are ascarides in the rectum, hemorrhoids, and varicose veins of the labia or vagina.

DIAGNOSIS.—Pruritus may be distinguished from prurigo by the absence of the alteration in structure which is characteristic of the latter disorder; and from other affections it is at once recognizable by the sound state of the skin.

TREATMENT.—The treatment of pruritus must be general or local, according to the nature of its cause. The general treatment must be directed to the regulation of the secretions; in a debilitated state of the system, tonics are indicated, and sedatives are in most cases indispensable. Arsenic sometimes acts as a specific. The diet should be digestible and nutritious, and stimuli avoided. The best local applications for soothing the pruritus are, the juniper tar, the sesquicarbonate of ammonia lotion, a solution of acetic acid, lemon-juice mingled with water, or the hydrocyanic acid lotion with emulsion of bitter almonds.

For the local varieties, constitutional treatment is equally necessary with local. In pruritus ani, if there be symptoms of congestion of the mucous membrane of the bowels, leeches should be applied to the verge of the anus, and the region subsequently fomented. If ascarides be present, they must be destroyed by a quassia or turpentine enema. I have found an opium injection relieve the irritation after all other means had failed. The local remedies most serviceable in pruritus ani are, juniper tar, either as an ointment, or in combination with alcohol; a weak solution of acetic acid, or bichloride of mercury, solution and tincture of opium, creasote, compresses saturated with liquor plumbi, the nitrate of mercury ointment, &c. The bichloride of mercury is contra-indicated, if there be abrasion of surface.

Besides the general remedies applicable to pruritus ani, a lotion of acetate of lead, of sulphate of zinc, or sponging with the spirituous solution of juniper tar, or with the compound tincture of benjamin, will be found useful in pruritus scroti.

Pruritus urethræ may best be relieved by the application of two or three leeches to the adjoining mucous membrane, followed by poppy fomentations. If these means should fail, cold astringent lotions may be tried, or an injection of a weak solution of nitrate of silver.

Pruritus pudendalis especially requires medication adapted to its cause. Where the presence of the fœtus in utero is the only apparent irritation, we must rely upon the restoration of the secretions and the administration of sedatives. If there be heat and dryness of the vulva,

symptoms which indicate congestion of the mucous membrane of the vagina, leeches should be applied to the inner surface of the labia, and fomentations of poppy-heads, or a cold poultice saturated with liquor plumbi, afterwards used. I have employed the juniper tar, creasote lotion, and a solution of the bichloride of mercury with advantage in this form of pruritus. Frequent ablutions with tepid water, containing a small quantity of sesquicarbonate of ammonia, subcarbonate of soda, supersulphate of alumina, or sulphuret of potash, are also beneficial. In a very troublesome case, when every other remedy had failed, I succeeded in removing the pruritus by the application of a blister upon the upper part of the thigh, near the vulva. M. Trousseau praises the effects of injections as warm as the patient can bear; he remarks, that he has seen great benefit result from the injection of hot water simply; and that the solution of bichloride of mercury used hot has proved successful after years of unavailing attempts with other remedies. Lisfranc recommends, that in cases where the pruritus bears relation to the menstrual periods, several small bleedings should be practised successively, and these, after a few repetitions, he never found to fail. He also advises nitrate of silver in the form of lotion and injection. The juniper tar ointment considerably diluted is a valuable remedy in these cases; as is also the juniper tar soap.

CHAPTER XVIII.

DISEASES AFFECTING THE SPECIAL STRUCTURE OF THE SKIN.

DISEASES OF THE PAPILLARY STRUCTURE.

THERE are certain abnormal states of the cutaneous textures, the external signs of which are, an increase in the growth of the skin without any appearance of inflammation. For example, there are those prominences which are known by the name of *warts*, and those other thickenings and indurations of the surface of the body which are termed *callosities* and *corns*. Mason Good gives, as a name to these enlargements, ECPHYMA,[1] or cutaneous excrescence, and his definition is, "a superficial, permanent, indolent extuberance, mostly circumscribed." The most obvious character of these enlargements is the accumulation of epidermis, not diseased epidermis, as in some of the preceding affections, but an epidermis in nowise, except thickness, differing from that of the rest of the body. Now, the epidermis, it is well known, depends for its thickness upon the papillary layer of the derma, being considerable when the papillary layer is highly developed, and *vice versâ*. Hence, an unusual thickening of the epidermis is an evidence of an abnormally developed or hypertrophous condition

[1] ἐκφύω, educo, egero.

of the papillary layer upon which it is fashioned and rests. This is precisely the pathological state of the diseases comprehended in the present group. The papillæ of the skin are unnaturally enlarged, in the case of warts, without any apparent cause; in the case of corns, in consequence of the irritation caused by pressure; and their enlargement is associated with an augmented formation of epidermis. I have already had occasion to remark, that in lepra there exists an hypertrophied condition of the papillæ of the skin, but the enlargement is associated with other morbid conditions, which give a specialty to that disease.

There is another form of hypertrophy of the epidermis consequent on a previously diseased state of the part of the body upon which it occurs, which I have also included in this group, under the name of *pachulosis*. In the first edition of this work, pachulosis was described under the title of ichthyosis spuria.

The diseases included in the present group are, therefore,

Verruca,	Tylosis,
Clavus,	Pachulosis.

VERRUCA.

Syn. *Ecphyma verruca*, Mason Good. *Warts. Sessile Warts.*[1] *Die Warze*, Germ.

A wart is a state of hypertrophy of the papillæ of the derma,[2] attended with an increased production of epidermis. (Plate VI., figs. 1, 2.) Warts are usually of small size, and of a rounded figure, *verruca simplex;* sometimes, however, they appear in the form of bands several lines in breadth, and of variable length. They are generally insensible, rough to the touch, and their medium projection from the surface is about a line. They may be developed at any period of life, but are most frequent in children and elderly persons, and arise without any apparent cause, to continue for the rest of life, or disappear unexpectedly. Their usual seat is the hands; less commonly they are seen on the trunk of the body, the scalp, or face.

Hypertrophy of the papillæ of the derma in the production of warts takes place without apparent cause, and without premonition. The papillæ, for the extent of a line, more or less, gradually increase in length, and constitute a small tuft. Each of these papillæ forms around itself an epidermal sheath, and these epidermal sheaths are held together, in the form of a bundle, by the epidermal mesh formed

[1] Under the name of *Verruca achrochordon*, a pedunculated wart is described by some authors. This is an error; warts, according to the above definition, are hyper-formations of epidermis, but the pedunculated warts are invariably productions of the derma, and, in many instances, as I have proved, the emptied tegumentary sacs of small sebaceous tumors.

[2] My researches into the structure of warts date as far back as 1830, when my attention was directed to their nature by a remarkable bleeding wart, which I had at that time on my own finger. Since this period, their structure has been investigated by Ascherson (*Casper's Wochenschrift*, 1835), and more recently by Dr. Gustav Simon, of Berlin (*Müller's Archiv.*, 1840). The latter writer speaks doubtingly of their origin in all instances by hypertrophied papillæ, and states that they arise sometimes where there are no papillæ. I differ entirely from him in this opinion.

between and around them by the bases of the hypertrophied and the surrounding normal papillæ. It very rarely happens that the whole of the papillæ included by the area of the wart are elongated; several of them retain their natural size, and these contribute to the production of the interfibrous epidermal mesh.[1] When warts have grown to some length, their extremity becomes rough, and their fibrous structure is distinctly apparent; it not unfrequently happens that warts of long standing split and break up in the direction of these vertical fibres, *verruca lobosa.*

The structure of a wart is also shown by making a succession of horizontal sections of its mass; by this means the longest papillæ will be cut across, and a slight oozing of blood will take place; and if the sections be continued, more and more of the apices of the papillæ will be divided. The structure of a wart is also well exhibited by thin sections cut horizontally and vertically, and examined under the microscope with a lens of low power.

Rayer compares warts formed of isolated papillæ, very aptly, to "coarse plush." He quotes from M. Rennes a remarkable instance of a wart of great extent (*verruca confluens*), and presenting the appearance of a band: "a band of agglomerated warts, from eight lines to an inch in breadth, extended from the upper and anterior part of the right side of the breast, underneath the clavicle, along the arm and forearm of the same side, till it reached the carpus, where it increased considerably in breadth, and finally overspread the whole palm of the hand."

Warts are generally known as isolated growths, or dispersed in scanty groups on different parts of the body, but they are sometimes met with so numerously as to constitute an *eruption of warts.* I have met with numerous cases of this kind; in one, a young tradesman, about twenty-five years of age, there were some hundreds of small warts clustered on the backs of the wrists and hands, and others upon the upper part of the forehead. Another example occurred in a girl of eighteen, whose hands and wrists on the dorsal aspect were covered with these morbid growths. While on the forehead of young women they are far from being rare.

But there is another kind of wart which is by no means uncommon, and which, from its appearance, may be termed *verruca digitata.* This wart is found on the scalp, and sometimes exists in that situation in considerable numbers. Fixed on the skin of the head, and throwing out on all sides its pale, finger-like papillæ, it may be mistaken for an insect, until its fixed adhesion to the skin and immobility prove the contrary. Sometimes the digitated wart is single, or a few only are met with; at other times, they are so numerous as to act as an impediment to combing the hair. They may be small, consisting of two or three digitated papillæ only, or large, forming a tuft of hypertrophous papillæ of considerable size. They are longer than ordinary warts, and commonly range from two to four lines in height.

[1] This interfibrous mesh is not present in all warts; when it is absent, the fibres adhere but slightly by means of their surfaces, and are kept together by the thick rim of epidermis which surrounds them.

CAUSES.—Warts frequently originate without apparent cause; sometimes they seem to depend on local irritation of the integument; and at other times result from a morbid state of the skin, commonly associated with torpor of function. Some persons exhibit an especial predisposition to the development of these productions. It is popularly believed that the blood proceeding from warts is capable of exciting their growth in unaffected persons. Such a supposition is too absurd to deserve further attention.

TREATMENT.—When warts are isolated, they may be removed by a caustic, but when they are numerous, they call for constitutional treatment. The best caustic for their removal is the potassa fusa, which requires to be used with care, and could not be safely trusted out of the hands of the medical man. Other caustics, which may be employed for a similar purpose, are, nitric acid, strong acetic acid, tincture of iodine, and the nitrate of silver. But the potassa fusa surpasses all these in removing the wart at once and completely, while at the same time it sets up sufficient inflammation to destroy the enlarged papillæ, and modify the structure of the derma. If too much inflammation be created, the part should be covered with a piece of Alison's lambskin saturated with water, with water-dressing, or a poultice. When other caustics than the potassa fusa are used, they harden and dry the epidermis, and the dried and hardened part requires paring each time that the caustic is repeated; with the potassa fusa no such elaborate process is needed.[1] For the digitated warts on the scalp, the potassa fusa is the best remedy, and the plan is, to soften them, and rub them away with a point of potassa fusa, while the patient is under operation. When removed in this manner, they rarely return.

But while the caustic removes the local disease, it is clear that it does nothing towards correcting the disposition in the system to the reproduction of warts; and, therefore, where they are numerous, and a verrucous constitution may be said to exist, it becomes necessary to have recourse to a constitutional treatment. For this purpose, I have prescribed arsenic with the greatest success, and it is curious to see with what rapidity the skin responds to the action of this medicine, and how rapidly an eruption of warts, apparently so little amenable to constitutional remedies, will disperse. I lately treated a young lady in Cumberland, whom I had not the advantage of seeing, in this way, and with complete success. She took the arseniate of soda for a brief period only, a few weeks, and pencilled the warts, which were of the digitated kind, and developed on the scalp, with a strong solution of the bichloride of mercury.

Other and less efficient remedies for warts are, the juice of the chelidonium majus, strong pyroligneous or acetic acid, the mineral acids, liquor potassæ, liquor ammonia, and the muriate of ammonia. The last is the safest and most manageable, and, with perseverance, is com-

[1] Mason Good observes that in Sweden warts are "destroyed by the *Gryllus verrucivorus*, or wart-eating grasshopper, with green wings spotted with brown. The common people catch it for this purpose; and it is said to operate by biting off the excrescence, and discharging a corrosive liquor on the wound."

monly successful, requiring to be rubbed upon the wart night and morning for some weeks.

Plumbe recommends the use of a small piece of blistering plaster laid on the crown of the wart, and covered by an adhesive strap. In the country, the juice of the chelidonium majus is a popular remedy.

CLAVUS. TYLOSIS.

Syn. *Corns. Callosities.*

A corn is an increased degree of thickness of the epidermis, resulting from hypertrophy of the papillæ of the derma; this hypertrophy being determined and kept up by the irritation caused by undue pressure and friction on the part affected. So long as the causes which first gave existence to the corn continue, the epidermis accumulates, and, by its pressure on the vascular derma may give rise to ulterior and serious consequences. But as soon as the pressure and friction are removed, the derma regains its natural state, and the epidermis ceases to be produced in abnormal quantity. The ordinary seat of corns is the feet; they may, however, be developed on every part of the body.

Corns present us with three modifications in relation to structure and degree, which may be considered as varieties; they are, laminated corns, fibrous corns, and soft corns.

LAMINATED CORNS.

Syn. *Tylosis. Callus. Callosity. Die Schwulle*, Germ.

Investigating the manner of development and growth of a corn, we find that, wherever a portion of skin is pressed and rubbed by a hard and irritating substance, as in the case of the integument of the foot by the shoe, and particularly when the part itself is unable to yield sufficiently, in consequence of its seat over a bone, to escape the pressure or friction, the vascular rete of the derma becomes congested. If the process were now to cease, the congestion of the derma would subside and the skin gradually return to its natural state. But instead of ceasing, the pressure and friction are continued from time to time, and for some hours together, for months and years; the derma becomes more and more habitually congested, and the papillæ are at first temporarily, and afterwards permanently enlarged, the lengthening of the papillæ being most considerable in the centre, where the greatest amount of pressure exists.

The enlargement or hypertrophy of the papillæ of the derma is a perfectly natural process, and the mere result of excitation of the cutaneous nerves in the first instance, seconded by vascular determination to the part, and subsequently increased vascularity, with the associated consequence, augmented nutrition. With hypertrophy of the papillæ, the function of these organs is likewise increased, and a proportion of epidermis corresponding with the enlarged papillæ is produced. The formation of this epidermis over the hypertrophied papillæ constitutes a callosity, or corn, and the thickness of the corn bears an exact relation to the thickness of the epidermis of the sur-

rounding skin, *plus* the increased dimensions and vascularity of the formative papillæ.

This is the mode of formation of every corn, and this the structure which all newly-formed and moderately sized corns present. It follows, from this description, that if we make a vertical section of such a corn, and examine the cut surface with a lens, we shall find the epidermal thickening perfectly homogeneous, and this is the general fact. Sometimes, however, it happens that the section of the corn presents a distinctly stratified texture, and the successive laminæ differ from each other in color. I have seen the laminæ presenting the various tints of light brown, dark brown, and even black. This peculiarity of structure is easily explained. A more violent pressure than usual, such as that produced by a new boot, or an unusually long walk, upon the enlarged papillæ, has caused an effusion of blood beneath the epidermis, or among the epidermal cells. A new formation of epidermis carries this ecchymosed part towards the surface, and it is seen on the face of a section as a dark lamina. Minor degrees of pressure will give rise to lesser sanguineous effusions, and consequently to lighter colored or thinner laminæ, and, moreover, the effused and desiccated blood will lose a considerable proportion of its color as it approaches the surface.

FIBROUS CORNS.

Syn. *Clavus*. *Die Huneraug*, Germ.

The preceding is a sketch of the history of the common laminated corn, or callus, but those who have paid attention to the subject will have observed in certain corns something more than this. On the summit of the corn they will have remarked an appearance resembling the ends of fibres; in cutting the summit horizontally, there is an appearance as though these vertical fibres were cut across (eye of the corn), and they may possibly associate with this appearance the popular belief in the existence of a core and root to the corn. If a vertical and central section be made of a corn of this kind, the existence of vertical fibres, generally slightly different in tint of color from the homogeneous epidermis, and frequently intermingled with traces of opaque white, is distinctly demonstrated. The explanation of this appearance is as follows:

The continuance of pressure on the central part of the convexity of the corn causes undue pressure on the derma, and the common result of pressure on a soft part ensues, the papillæ are absorbed, next the entire structure of the derma is thinned, and, after a time, even the tissues below the derma are injured by the compression. The part of the derma which in the early stages of the corn was more convex than the rest, now becomes depressed, and instead of being a prominence, is a hollow cup of greater or less depth. We have, therefore, two conditions present in the derma, the bearing of which on the production of the superjacent epidermis is now to be considered. The derma being thinned almost to the state of atrophy, and the papillæ removed by absorption, the epidermis is necessarily *altered in structure;* it becomes horny and of a deeper color than the surrounding cuticle.

In the second place, the secreting surface having lost its plane position and become concave, the epidermis is *altered in direction*, and the continuity between the cup-shaped layers corresponding with the depression of the derma, and those of the plane surface around, is disturbed. It is this alteration of direction, and the uprising of the edges of the layers corresponding with the rim of the cup on the surface of the corn, which produces the appearance of fibres; the whole mass of altered epidermis constituting the core of the corn.

The art of the chiropodist consists in dislodging the core of the corn from its concave bed, and when this is done, it is no uncommon thing to find a drop of serum or pus, and sometimes extravasated blood beneath its deepest part. When these fluids are removed, the surface of the derma, congested and tender, is seen to be exposed.

The description of a corn which I have now given appertains to one of long standing; in those of more recent formation every degree of transition may be observed, from the simply congested and hypertrophous condition of the papillæ to their progressive and total absorption. The structure of the core of the corn is often apparent on its surface from the gradual wearing away of its summit; this process being equivalent to a horizontal section.

Corns sometimes give rise to serious consequences; by pressure on bursæ they produce bunions; when seated on joints they often excite inflammation of the structures entering into the formation of the articulation, exostosis of bones, &c. I once dissected a corn situated on the metacarpo-phalangeal articulation of the little toe, which had made its way into the joint, and had produced absorption of the articulating ends of both bones.

SOFT CORNS.

These productions are exceedingly painful and annoying, and more troublesome than the two preceding varieties. They occur between the toes, are always of small size, present little or no convexity on the surface, and, from being constantly immersed in the perspiratory secretion which collects in the situation of their growth, they are soft to the impression of the knife.

In manner of formation and growth, soft corns are identical with the preceding. From the pressure of the toes one against another, some point of the skin, either corresponding with or on the soft parts immediately opposite the prominent head of a phalangeal bone, becomes slightly inflamed, and a greater thickness of epidermis than usual is formed. At this stage of growth of the corn, it frequently happens that an increase of irritation gives rise to effusion of a serous fluid beneath the white and thickened epidermis. The epidermis is rendered soft by saturation with the fluid, and a small aperture is formed in the centre of the disk, through which the serum escapes. I have seen a soft corn remain for several months in this state during the summer season, the surface of the derma continuing to secrete serum, and the serum being retained, or escaping through the small central aperture. At other times, and when the irritation is less severe, the epidermis is thickened by the addition of fresh epidermal

formations to its under surface, until a convex mass is formed, which, by pressure on the papillæ of the derma, effects their absorption, and puts a stop to the continuance of the formative process. If a soft corn be extracted at this period, it will be found to be plano-convex, the plane surface corresponding with the level of the adjacent epidermis of the toe, and the convex surface projecting more or less deeply into the derma.

The soft corn sometimes gives rise to the formation of an ulcer, and being separated from the adjacent tissues by suppuration is thrown off. In one case I saw a sinuous ulcer, excited by a soft corn, extend as far as the phalanx; it was followed by exfoliation of the surface of the bone, and a permanent stiffness of the joint.

CAUSES.—The causes of corns are pressure and friction. They occur at all periods of life, and under various circumstances. On the feet they are usually produced by the friction and pressure of shoes or boots, which are either too tight or too loose. Between the toes they result from pressure of these members against one another. They may also be the consequence of club-foot, where parts of the skin unused to pressure are made to support the weight of the body. On the hands, corns are met with as a consequence of the pressure or friction of tools in certain trades; of the oar in rowing. On the knees they result from much kneeling; and are also found on various other parts of the body.

TREATMENT.—The treatment of corns offers two indications, one curative, the other palliative. The first consists in the removal of the cause, namely, pressure and friction; and the latter in pruning, from time to time, the horny growth. The first indication may be fulfilled, where practicable, by rest and disuse of the article of dress which occasioned the affection; or by means of plasters of thick soft leather, perforated in the centre by a round aperture that fits the summit of the corn, and relieves it from pressure. Plasters of amadou are well adapted for this purpose. The palliative treatment consists in the removal of the thickened epidermis either by scraping or filing, after the corns have been well soaked and softened in an alkaline solution; or by cutting, either in the soft or the hard state. The chiropodists dissect out the central part of the corn, the eye or root, as they term it, by a patient process of cutting and tearing, leaving the circumference to serve as a circular cushion of protection to the more tender central part.

Other modes of removing the epidermis, are, by nitrate of silver, by plasters containing the solvents of albumen, namely, soda and potash, &c. It should, however, be recollected that the formation of a corn is not a morbid process, but simply an augmentation of a natural function, kept up by irritation.

The only cure for the soft corn is its entire removal. This may most easily be accomplished by the help of a pair of scissors; all the thickened epidermis being taken away at the same time. The formation of soft corns may be prevented, and when present they may be rendered bearable, by daily ablution with soap, and by placing a piece of cotton-wool between the toes after each ablution.

PACHULOSIS.

After certain chronic affections, in which the skin is secondarily involved, particularly that of the lower extremities, the epidermis is produced in abnormal quantity; it becomes thick, dry, and harsh, and cracks into scales of irregular form and size. This appearance of the skin has been admitted by Willan into his description of ichthyosis, and referred to by other writers, under the title of accidental ichthyosis, but it is quite clear, from the description of ichthyosis given in the chapter on the diseases of the sebiparous system, that the present disorder bears no relation to that affection. As an inordinate production of epidermis dependent on hypertrophy of the papillæ of the skin, it has a title to a place in this group, while its principal character, namely, that of thickening and condensation of the skin, seems to point to pachulosis (παχὸς, crassitudo) as a fitting designation.

This state of the skin occurs for the most part in elderly persons, and not unfrequently after the healing up of an old ulcer of the leg. I have also seen it follow some lasting cutaneous disorders, such as chronic eczema. It is sometimes a sequela of anasarca.

TREATMENT.—The treatment of pachulosis consists in sponging the scaly surface with a damp sponge, dipped in fine oatmeal, diligently, for five or ten minutes, and then anointing the surface with a liniment of lime-water and oil; adding to this liniment as the torpor of the skin gradually yields, a few drops of liquor ammoniæ. In the course of a short time, the natural tone of the skin may generally be restored by this treatment. Another mode of treatment, is to remove as much of the hardened coating as possible with soap, then cover it up with a plaster of diachylon softened by melting with an equal proportion of almond-oil, and bind it closely to the skin with an elastic bandage. The dressing should be repeated every second day; and every time the plaster is removed the diseased surface should be well washed with soap. This process should be continued until the whole of the hardened cuticle is cleared away, and the skin brought into a healthy state.

CHAPTER XIX.

DISEASES AFFECTING THE SPECIAL STRUCTURE OF THE SKIN.

DISEASES OF THE PIGMENTARY STRUCTURE.

UNDER this head, corresponding with the order MACULÆ of Willan, EPICHROSIS of Mason Good, or Dyschroma, are assembled those affections of the cutaneous textures which are characterized by discoloration of the skin. The precise seat of these alterations is the rete mucosum and papillary layer of the derma. The cause may be referred to three principal conditions: firstly, the original organization of the individual; secondly, alteration of function of the derma without ap-

parent change of structure; and thirdly, alteration of nutrition of the epidermal cells of the rete mucosum.

Maculæ may be arranged in three principal groups, namely, those which are characterized by *augmentation* of the natural pigment of the rete mucosum; those in which there is *diminution* of pigment; and those which present a *morbid alteration* of pigment. To these characters, which are indicative of important differences, both as regards quantity and kind, in the natural pigment of the skin, I propose to add a fourth group, with a view of including that remarkable alteration in the color of the skin which is produced by the internal use of nitrate of silver. The seat of this discoloration is different from the preceding, inasmuch as it occupies the papillary layer of the derma, and may very properly be considered under the designation of *chemical coloration* of the skin.

I. AUGMENTATION OF PIGMENT.

MELANOPATHIA.

Nigrities. Nigredo cutis. Die Schwarze Haut, Germ.

When we compare the distribution of the pigment of the skin throughout the members of the human family, we are struck with two remarkable extremes of difference, as illustrated in the jetty black of the tropical zone, and the fair complexion of the natives of colder climates. Between these extremes every shade of tint may be found in intermediate latitudes; and, indeed, by the alteration of the solar influence only, the pigment may be increased in those of fair skin, and on the other hand, may be diminished in the dark to a very considerable extent; but we require to proceed no further than our own hearths for an illustration of the fact, that the fair complexion may be rendered dark by the stimulation of light during the summer months, and the quantity of pigment will be again reduced during the winter season. To state this fact in physiological language, the activity of the functions of the skin is increased during the summer, and under the stimulus of the sun; while in the winter season it is diminished to its minimum. One of the functions of the skin is the formation of pigment; and, under the stimulus of light and heat, and of the sun's rays, this function is greatly augmented, and the skin, consequently, assumes a darker tint.

But it is scarcely necessary to remark that the phenomena involved in the functions of the skin are not wholly referable to external agencies. That which the stimulus of light and of the sun's rays is to the skin, under natural circumstances, the stimulus of morbid action may be in a disordered state of the system. Hence, we occasionally meet with instances in which the skin is altered in its color in a brief period of time, either temporarily or permanently, as one of the consequences of disease, this alteration being confined to a limited region, or being more or less generally diffused over a large surface.

Again, it is clear that especial organization must also contribute very largely to the differences of tint which are observed in the

human race. The long winter of the colder climates, or protracted imprisonment in a darkened cell, would not blanch the skin of the negro any more than would the long blaze of light, and the intense heat of the torrid zone, confer upon the skin of the European the rich jet of the native African. We are yet to learn how far colonization for a number of years would give rise to these results. It is to especial organization that we must have recourse, to explain the great difference in shade of color that exists among the inhabitants of the same island, and the differences which we often meet with in different parts of the body of the same individual. In persons of dark complexion, certain parts of the cutaneous surface always present a deeper tint than the rest. One of the natural changes occurring at puberty, is the alteration of the skin of the sexual apparatus to a brown color, more or less deep in different individuals, while in rare instances, the skin in this region presents a deep black. Haller, in his Physiology, relates a case of this kind. The alteration of color which takes place in the areola around the nipple of pregnant women is an analogous change. In some persons the cutaneous pigment in the genital region is partial in its distribution, and appears in the form of patches of various size. Again, patches of a darker color than the surrounding skin, but identical in every other respect, may be developed upon any part of the surface of the integument in individuals of every shade of complexion. Plenck seems to be under the belief that the Tartars have naturally a mottled skin: "Cutis variegata nativa; in Tartarorum gente tigridis instar;" while of another variety of Maculæ cutus, namely, "cutis variegata morbosa," he observes, "Visa est ad semel in uno subjecto facies viridis, latus corporis dextrum nigrum, et sinistrum flavum."

The alteration of color which takes place around the nipple of pregnant women, is a curious physiological change, but one which comes so constantly before our eyes, as to meet with little attention. This deepening of color corresponds with that part of the skin of the breast which is termed the areola, but occasionally, nature makes one of those singular aberrations from her ordinary laws, that stimulate our curiosity and interest. Such was the case in the following narrative, communicated to me by Mr. Jackson, of High Wycombe, Buckinghamshire. "Martha Weston, aged eighteen, came into the Union House in June, 1843, to be confined, being the last month of her first pregnancy. My attention was directed to her by the matron, in consequence of an unusual darkness of the skin. Upon examination, I found the anterior surface of the body from the clavicles, downwards to about the middle of the thighs, of a negro blackness.

"From the girl's statement I learned that, shortly after she became pregnant, the areola around each nipple looked very dark, but no further perceptible change took place until she quickened, when an evident darkness of the whole breast was visible, extending upwards to the throat, and downwards to the thighs, gradually assuming a deep black color. Over the hips it extended laterally, but no part of the posterior surface of the body was affected. Her complexion was

naturally rather dark, with black hair and eyes. Her health had been always good, neither had she experienced more than the usual degree of irritation resulting from pregnancy. At her labor, I was called in by the midwife to the Institution, in consequence of a presentation of the hand and umbilicus; turning was resorted to, and the girl did well. She left the house a month after her confinement, at which time there was no alteration in the blackness of the skin; but on my last meeting her, about a year afterwards, she assured me it had entirely disappeared."

The following interesting case of general melanopathia was communicated to me by the late Dr. Pereira.

"John Daniels, aged seventeen, weaver, applied at the London Hospital, on account of the dark color of his skin. He states that for some months past he has been changing color and becoming darker; and that his companions have annoyed him by saying that he is changing to a negro. His appearance is that of a dark-colored gipsy. The darkness of the skin, though general over the body, was most marked at the nape of the neck, and least so on the nose and upper lip. His hair is light-colored, and his eyes gray; these, his mother states, have undergone no change during the alteration of the color of the skin. His mother is remarkably fair, and she tells me that his father is equally so; and that, until about fifteen months ago, the son was considered very fair. The darkening commenced in the summer; but the boy had not been particularly exposed to the sun prior to the change. He worked with his father at weaving, principally of black goods. The tint of the skin was brown, and in this respect differed from the slate-color induced by the use of nitrate of silver. It somewhat resembled that which I have seen induced by the inhalation of arseniuretted hydrogen; but in the latter case the sclerotic coat of the eye was discolored; whereas, in Daniels's case, the sclerotica was remarkably white.

"I carefully questioned both the boy and his mother as to the use of medicine, or of any other agent which could have induced this change of color in the skin, but without avail. The boy had taken no medicine, and, to the knowledge of himself and mother, had been subjected to no deleterious influences. The color obviously depended on some alteration in the quantity or quality of the coloring matter of the skin. It could not depend on the presence of any coloring matter in the blood, since neither the conjunctiva nor the mucous membrane of the mouth was altered in color. The total absence of desquamation and itching readily distinguished the case from melasma (Pityriasis nigra). A blister was applied to the nape of the neck. After it had caused vesication, it was obvious that the dark color of the skin resided in the derma, and not in the cuticle. The mother states that the intensity of the color is not always alike, being sometimes much greater than at others. No great hopes being held out that medicine would affect the change going on, the boy ceased to attend the hospital after a few weeks."

In a case of melanopathia which I had an opportunity of seeing, through the courtesy of Mr. Acret, of Torrington Square, the black-

ness affected the entire skin, with the exception of the feet and legs as high as the calf. The subject of this curious affection was a young woman, twenty-eight years of age, who had enjoyed good health up to the first of December, 1844. At this date, she suddenly felt unwell, and suffering from nausea, took an antimonial emetic, which failed to procure vomiting. She was then attacked with typhus fever, and was seriously ill for somewhat more than a month, being unable, during the greater part of that period, to sleep, and being frequently delirious. Previous to the illness, menstruation was regular and the menses copious; but since her recovery, she has suffered from amenorrhœa, with much periodical pain, until the last three months. Her health at present is what she styles "good," that is, her strength is not impaired, but she is liable to headache, has an eczematous eruption on the scalp, and a dainty appetite.

It was on her recovery from the above illness that the change of color in the skin was first observed. Her hair and eyes are black, and her complexion was originally that of a brunette; but she has now the color of an East Indian. The darkest parts of her body are, the back of the trunk, and the backs of the hands and arms. On the face, the red tint of the cheeks blended with the black, and the yellow of the forehead and nose struggling for mastery with the deeper tint, gave her complexion a singularly Indian appearance. And the peculiarity of her color is heightened by the extension of the blackness to her lips, and in patches to the mucous membrane of the mouth. Even the teeth have a bluish tint, the lips and teeth seeming as if stained by the eating of black cherries. The sclerotic coat of the eyeball is brilliantly white.

On close inspection of the skin, the blackness is seen to be not perfectly uniform; there are small patches in which the depth of color is greater than in others, the darker-colored spots corresponding with the apertures of follicles. The areola of the nipples approached in depth of color to a negro-blackness.

Another case, communicated to me by the late Dr. Sarti, was as follows: Pietro Nanni, a peasant, of St. Martino al Castagna, fifty years of age, having unluckily got into a fray, was fired upon and put in danger of his life. The shock caused a severe illness, and three months afterwards his skin gradually darkened, until it became quite black. The change was first perceived on his cheeks, and thence extended over the entire body, being greatest on the front and sides of his breast, the inner sides of his legs, and the hands. With the termination of this case I am not acquainted.

Dr. Addison[1] has lately called the attention of the profession to the association of melanopathia with disease of the suprarenal capsules, and has adduced several examples of this union, of which the following are the most striking. A baker, aged thirty-two, ill for three years, had, during that period, two attacks of obstinate cough, accompanied with extreme weakness. After the cessation of the

[1] On the constitutional and local effects of diseases of the suprarenal capsules: by Thomas Addison, M.D. 4to. 1855.

cough, the first time, his skin, previously white, began to darken; at the end of the three years, it was so dark that he had the appearance of being descended from colored parents. "The cheeks are a little sunken, the nose is pointed, the conjunctivæ are of a pearly whiteness; the voice is puny and puerile." "He complains of a sense of soreness in the chest, about the scrobiculus cordis." There was no fault about the urine, and Dr. Golding Bird, under whose care he was, considered the case to be one of anæmia. He died, soon after these observations were made, of "acute pericarditis and pulmonic inflammation." On examination after death, besides disease of the lungs and pericardium, and a fragile state of the liver and spleen, the kidneys being healthy, "the suprarenal capsules were diseased on both sides, the left about the size of a hen's egg, with the head of the pancreas firmly tied down to it by adhesions. Both capsules were as hard as stones." Dr. Addison concludes from this case, that "the slow and gradual inroads of the disease, and the remarkable excess of pigment, were sufficiently accounted for by the universality of the change that had taken place in the structure of both capsules."

A tide-waiter, aged thirty-two, of bilious temperament, having dark hair and a sallow complexion, was observed during the last six months of his life, to be growing gradually dusky in complexion, until he became of a *dark olive brown color;* and black pigmentary patches were developed on the mucous membrane of the insides of the lips. His duties were anxious, and exposed him to alternations of weather; but, with the exception of an attack of rheumatism and occasional bilious vomitings, he had enjoyed good health until six months since, when he was seized with a bilious attack of greater violence than usual. On this occasion, the vomiting, headache, and constipation were succeeded by delirium and temporary insensibility, these latter being followed by numbness and loss of power of the fingers and legs, and extreme debility, which continued for some weeks. Three months later he returned to his duties, but was again laid up with headache, vomiting, and constipation; and two months after this, was admitted into Guy's Hospital, where he died after twenty-seven days. His symptoms while in hospital, under the care of Dr. Gull, were, extreme physical depression and debility, sickness with vomitings of mucus, containing a little altered blood; tenderness of epigastrium, constipation, clear tongue, cool skin, natural urine, small and feeble pulse, and anxiety of countenance. After death, the suprarenal capsules were found to contain "compact fibrinous concretions," which, "superficially examined, were not unlike some forms of strumous tubercle." "The brain, lungs, heart, spleen, liver, and kidneys, were normal, but the mucous membrane of the stomach gave evidence of subacute gastritis."

A carpenter, twenty-six years of age, of strumous constitution and intemperate habits, had observed during the four months which preceded his death, black patches of discoloration upon the mucous membrane of his lips, a general change in his complexion to a yellowish and olive hue, and patches of black upon the face and in the axillæ. He had enjoyed good health until six months before

death, when he was attacked with pains in the right leg, extending upwards to his back, and resulting in disease of the upper three lumbar vertebræ and lumbar abscess. He died twenty-seven days after admission into hospital, his death being preceded by extreme debility, torpor, sickness of stomach, hiccough, and typhoid symptoms. Dr. Rees, under whose care he was during part of his illness, found "white corpuscles" in his blood; after death, besides strumous deposits in the lungs, the suprarenal capsules were found "completely destroyed, and converted into a mass of strumous disease, the latter of all degrees of consistency."

The inference which is drawn from these cases, is, that whenever melanopathia of the skin, in conjunction with extreme prostration of the physical powers and anæmia, exists, without other perceptible cause, disease of the suprarenal capsules will be found after death. The kind of disease of these organs seems to present considerable variety, for of eleven cases recorded by Dr. Addison, both capsules were diseased in seven, and one only in four. Of the forms of disease, one was atrophy from inflammation; one, enlargement with induration; one, deposits of compact fibrinous concretions; four, scrofulous deposits; and four, malignant deposits. Dr. Addison expresses his "belief that the urgency of the symptoms, and the quick or slow progress of the disease, are determined by the activity or rapidity of the morbid change going on in the capsules, and by the actual amount or degree of that change; and that universal disease of both capsules will, in all probability, be found to prove uniformly fatal." This opinion does not appear to be borne out with accuracy by the evidence of his cases, for, of the total eleven cases now referred to, the period of duration of the disease as ascertained in seven, ranges as follows: three years, one year, six months, four months, three months, two months. The four longest periods are those which correspond with disease of both capsules; the three shortest, namely, from four months to two months, with disease of one capsule only. The order of fatality as respects the nature of the disease was as follows: three years, enlarged and indurated; one year, enlarged and indurated, with tubercular deposit; six months, fibrinous concretions; four months, softened strumous deposits; four months, atrophy from inflammation; three months, malignant deposit in one capsule; two months, tubercular deposit in one capsule.

The subject, however, is in the infancy of its research, and we must accept Dr. Addison's observations as a valuable contribution to medicine, and as a basis for further investigation. It cannot be allowed that all cases of melanopathia are also examples of disease of the suprarenal capsules, any more than that every case of disease of the suprarenal capsules must be necessarily accompanied by the deposit of a dark pigment in the skin. Dr. Addison has very properly shown that melanopathia is only one of the symptoms, of a series of those which constitute the peculiar form of anæmia which he so forcibly describes. "For a long period," he writes, "I had, from time to time, met with a very remarkable form of general anæmia, occurring without any discoverable cause whatever; cases

in which there had been no previous loss of blood, no exhausting diarrhœa, no chlorosis, no purpura, no renal, splenic, miasmatic, glandular, strumous, or malignant disease." "The disease presented in every instance the same general character, pursued a similar course, and, with scarcely a single exception, was followed, after a variable period, by the same fatal result. It occurs in both sexes, generally, but not exclusively, beyond the middle period of life, and so far as I at present know, chiefly in persons of a somewhat large and bulky frame, and with a strongly marked tendency to the formation of fat. It makes its approach in so slow and insidious a manner, that the patient can hardly fix a date to his earliest feeling of that languor, which is shortly to become so extreme. The countenance gets pale, the whites of the eyes become pearly, the general frame flabby rather than wasted; the pulse, perhaps, large, but remarkably soft and compressible, and occasionally with a slight jerk, especially under the slightest excitement; there is an increasing indisposition to exertion, with an uncomfortable feeling of faintness or breathlessness on attempting it; the heart is readily made to palpitate; the whole surface of the body presents a blanched, smooth, and waxy appearance; the lips, gums, and tongue, seem bloodless; the flabbiness of the solids increases; the appetite fails; extreme languor and faintness supervene, breathlessness and palpitations being produced by the most trifling exertion or emotion; some slight œdema is probably perceived about the ankles; the debility becomes extreme, the patient can no longer rise from his bed, the mind occasionally wanders, he falls into a prostrate and half-torpid state, and at length expires." "The leading and characteristic features of the morbid state," are, anæmia, general languor and debility, remarkable feebleness of the heart's action, irritability of the stomach, and a peculiar change of color in the skin, occurring in connection with a diseased condition of the "suprarenal capsules." Furthermore, "the great distinctive mark of this form of anæmia is the singular dingy or dark discoloration of the skin;" "a dark, dingy, or smoky-looking discoloration of the integument." And Dr. Addison records his belief, that "the disease is by no means of very rare occurrence."

Returning now to the three cases of melanopathia, narrated by me, with the view of ascertaining how far they accord with Dr. Addison's description, it will be evident that my first case, that of Martha Weston, must be looked upon merely as a physiological phenomenon. In the second case (John Daniels), Dr. Pereira speaks of the sclerotica as being remarkably white, but does not otherwise lead us to infer the existence of anæmia, or any constitutional disease; the discoloration had been in existence fifteen months when it came under his observation. The patient, in the third case, was decidedly anæmic, and the subject of some obscure organic disease which may have been that of the capsulæ suprarenales; I regret, however, that I am unable to report her present state; she had been two years undergoing a gradual change of color, and, according to Dr. Addison's views, ought by this time to be dead.

According to Dr. Addison, disease of the capsulæ suprarenales is

attended with disturbance of the chromatogenous function of the skin, such disturbance tending to the production of an excess of black pigment. Upon the announcement of this proposition, we naturally inquire whether these organs, which have heretofore been considered of so little importance to the well-being of man, which we have been taught to look upon as mere vestiges of an organ that had fulfilled its office, and was no longer of any use, are really so influential in the economy of man, that a mere state of atrophy, or a tuberculous condition of one of them, is sufficient to set up a series of remarkable symptoms which result in the death of the individual in four months in one case, in one month in the other; and which possess the singular power of causing the development of an excess of pigmentary matter, the latter being not merely limited to the skin and mucous membrane, but in one case presenting itself as a true melanosis, "scattered in small masses over the omentum, the mesentery, and the cellular tissue on the interior of the abdominal parietes." In taking this view of the suprarenal capsules, we must not overlook their intimate relation with the great abdominal centre of the organic system of nerves, nor shut out from our minds the probable effects upon that centre of a disease which will necessarily involve many of its filaments; which, in one case, at least, had extended to the semilunar ganglion, and produced fatty degeneration of a portion of that ganglion and of the adjacent plexus, and which, by producing irritation and probably disease of that plexus, might lay the foundation for those gastric symptoms, and that state of physical prostration and anæmia to which Dr. Addison refers. Admitting all this, we have, as an explanation of the phenomena indicated by Dr. Addison, namely, spontaneous or idiopathic anæmia, with melanopathia of the skin, and associated disease of the capsulæ suprarenales—disease of the capsulæ suprarenales, irritation or disease of the solar plexus, arrested hæmatogenesis, augmented chromatogenesis, exhaustion, death. In a word, the solar plexus is the actual source of all these successive phenomena, and the disease of the capsulæ suprarenales only the exciting cause. A state of irritation or disease of the solar plexus will explain all those symptoms which we have difficulty to comprehend as flowing from such apparently insignificant organs as the suprarenal capsules. It will explain, also, how similar effects result from diversity in the nature of the disease of those organs; how atrophy, hypertrophy, induration, tubercular deposit, carcinomatous deposit, may all occasion the same series of symptoms; it will explain the arrest of formation of the red coloring matter of the blood, and the consequent augmentation of the white corpuscles; and it may be a means of explaining the hyperformation of pigment in the skin, and in other tissues of the body. And further, it will remove an objection which I should otherwise be inclined to set up, namely, the diversity in the forms of the melanopathia, described by Dr. Addison. For, as the case at present stands, every black patch of discoloration of the skin becomes the foundation of a diagnosis of diseased suprarenal capsules, and prognosis of speedy death; a line of argument which is clearly unfounded. But I cannot object, indeed, I think it worthy of our most attentive consideration, to the diagnosis of irritation and probable dis-

ease of the solar plexus in these cases. I should strongly protest against a harmless chloasma being set down as a sign of a fatal cachexia; but my experience is altogether in favor of considering it a consequence of *irritation of the great centre of innervation of the assimilative organs.* But Dr. Addison goes further than this, and suggests the inference that the suprarenal capsules are the special regulators of the black coloring principle of the body, for, in relation to a case in which there was simple extravasation of blood into one of the capsules, from obstruction of its vein by a malignant tubercle, he observes, "this case would render it probable that the excess of dark pigment, so characteristic of renal capsular disease, depended rather upon an interruption to some special function than upon the nature of the organic change; for, with the exception of the manifestly recent sanguineous effusion into its tissue, the capsule itself did not appear to have undergone any considerable deterioration." With such an inference I am indisposed to agree, and the physiology of the suprarenal capsules in no way inclines to such a conclusion.

SPILUS *vel* NÆVUS PIGMENTOSUS.

Syn. *Moles.* *Epichrosis spilus*, Mason Good. *Pigmentmuttermäler*, Germ.

Besides the patches already described, which are even with the surrounding skin, and in every way identical in structure, excepting as regards increased production of pigment, there are other discolored spots and patches found upon the integument, which are termed *pigmentary nævi* or *moles.* The subject of nævus, or mother's mark, does not belong to this division of cutaneous affections; but it is necessary here to allude to these spots, on account of their dissimilarity to the rest of nævi, which latter are vascular alterations of the skin (p. 510). Pigmentary nævi, on the other hand, are not more vascular than the rest of the integument; they are characterized by a yellowish or brownish, and sometimes a black color,[1] are very slightly or not at all raised above the level of the skin, and are frequently covered with short bristly hairs. The dark color of these patches evidently depends on augmentation of the pigment of the rete mucosum, and deposition of pigment in the papillary layer of the derma. Pigmentary nævi are various in point of size, being sometimes small, and at other times so large as to cover nearly one-half the face, or a considerable extent of the trunk of the body, or of one of the limbs. They are met with on all parts of the surface, but particularly on the face and back. When they are raised above the level of the adjacent surface, the elevation depends chiefly on the presence of the hair follicles and their contained hairs, which give an increased thickness to the skin.

Although perfectly innocuous in their nature, pigmentary nævi are generally unsightly; in such cases, the medical practitioner is appealed to, and it becomes necessary to adopt measures for their

[1] Spilus, ab σπῖλος, macula.

cure. When of small size, they may be removed without inconvenience by means of a fine point of potassa fusa; but when of large dimensions, they call for the use of the bistoury. They should be included within two incisions, embracing an elliptical portion of skin, and in the direction of its natural folds. With this precaution, all trace of the operation is speedily obliterated.

II. DIMINUTION OF PIGMENT.

LEUCOPATHIA.

As, in the preceding section, we had occasion to reflect upon the production of an excess of pigment in the skin, originating in causes wholly unknown, so now we have to consider an opposite state as regards the pigment, namely, that in which there is a diminution or total absence of this production, *leucopathia*. The former state, when unassociated with disease, is usually accompanied by robust health and augmented strength in the individual, while, on the other hand, destitution of the natural pigment is indicative of debility of the nervous and vascular systems, and weakness of the physical and moral energies. Diminution of the natural pigment of the skin may be congenital or accidental, and in distribution it may be general or partial.

GENERAL LEUCOPATHIA; ALPHOSIS.

Achroma, Alibert. *Epichrosis alphosis*, Mason Good. *Albino skin.*

Albinoes are met with among all races of mankind, among the dark-complexioned nations of the south, as well as among the fair-haired inhabitants of the coldest regions of the earth. They are remarkable for a congenital and entire absence of pigment, not only in the rete mucosum of the skin, but also in those other parts of the body which are usually characterized by their dark color. The skin in these persons is of a milk-white color, the hair is fair, and usually soft and silky; sometimes it is harsh and wiry in texture, and the entire body is covered with a soft white down. The eyes are red, from the absence of pigment in the choroid membrane, and the iris presents a pinkish tint.[1] There is intolerance of light, the pupil is small, from the contraction of the iris to exclude the luminous rays, and the person bows his head habitually towards the ground, in order to shadow the retinæ as much as possible. At dusk, however, when the luminous rays are fewer in number, the albino rears his brow, and walks erect, his eyes are no longer overwhelmed by excess of light, and he is enabled to see surrounding objects in the night of other men. The albino is usually short of stature, and weakly in powers both of body and mind.

Albinism is sometimes accidental in its development, arising without any apparent cause, upon some part of the body, and thence extending

[1] In India "the irides are blue and the hair is silvery white."—Brett on the Surgical Diseases of India. 1840.

to the entire surface. Instances of accidental general leucopathia have only been observed among the natives of Africa.

An example of complete albinism in the negro, *alphosis æthiopica; leucæthiopes*, might have been seen frequently in the streets of London, a few years back; the subject was a tall, sickly-looking man, who styled himself Henry Alexander Commotius Stewart, the African Albino. This man was born in New Providence, of black parents, his father being a negro from Guinea, and his mother a native of the Island of Antigua, descended from African slaves. His four brothers and sisters were all black. He is tall, has a complexion like that of a dead leaf, sprinkled over with large and irregular freckles, light-colored eyes, and a light red woolly hair, surmounting features obviously bearing the African stamp.

PARTIAL LEUCOPATHIA.

Ephelis alba. Epichrosis pœcilia, Mason Good. *Cutis variegata. Piebald skin.*

Partial leucopathia, or the diminution or absence of pigmentary secretion upon one or more parts of the body, as a congenital peculiarity, is most frequently observed among the darker races of mankind, in whom it is likely to attract most attention; it also occurs, but more rarely, among the white races. Several instances of the "pied negro" have been recorded, and such defects of development are not very uncommon among the African race. When the patches are seated on the scalp, the hair participates in the change, and is produced of snowy whiteness.

Partial leucopathia is sometimes accidental in its development, occurring without apparent cause as one of the natural changes of the system. A remarkable case of this kind, the subject being a native of Virginia, is recorded in the fifty-first volume of the Philosophical Transactions.

In my *Portraits of Diseases of the Skin*[1] is represented the appearance of the skin in a gentleman, who, originally of fair complexion, became brown (melanopathia), and subsequently lost the cutaneous pigment on various parts of the body (leucopathia). Several white patches made their appearance on his face; one nipple was perfectly divested of pigment, while the other was as dark as that of a woman far advanced in pregnancy; and, as if to render the case still more remarkable, the lost pigment was accumulated on the side of the trunk in blotches of deep black. He had been undergoing this change for seven years before he came under my observation.

In Europeans, this alteration is most frequently met with on the scrotum of old persons, in which situation it appears under the form of irregular patches, and sometimes of longitudinal stripes. M. Guyon observed partial leucopathia in Algiers, where it is apt to take place in Europeans as well as in Arabs. Mr. Brett remarks that in India, partial leucopathia "occurs in circumscribed patches, which are quite

[1] Plate XXXIII., H.

insensible, though the disease commences by itching, pain, redness, and other marks of inflammation." These latter are probably patches of morphœa alba, and appertain to elephantiasis.

TREATMENT.—In a case of partial leucopathia which came under my observation, in a young lady, whose health was in other respects very considerably deranged, the natural hue of the skin was entirely restored by means of tonics and the shower-bath, and by the application of stimulating liniments to the faded spots. Mr. Brett, in his Essay on the Surgical Diseases of India, where this disorder is common, observes: "The treatment consists in the exhibition of the asclepias gigantea in combination with alterative doses of mercury and antimony, and topical stimulants. A blister applied to the white patch will be found advantageous. Stimulating the affected part with sulphureous douches, and with sulphur ointment and volatile liniments, is also of great advantage. The disease is considered by the natives as incurable."

III. MORBID ALTERATION OF PIGMENT.

The affections which may be arranged under this designation are four in number, namely,

Ephelis,	Chloasma,
Lentigo,	Melasma.

EPHELIS.

Syn. *Sun-burn.* *Epichrosis ephelis*, Mason Good. *Maculæ fuscæ.*

The term ephelis (ἐπὶ ἥλιος, the sun) is intended to express the change which is produced on the skin of many persons by exposure to the influence of the sun's rays. This discoloration is developed in small patches of irregular form, and of a variable tint of brown, upon those parts of the body, as the face, neck, shoulders, hands, &c., which are unprotected by dress. The spots of ephelis are most remarkable in children and women, and in persons possessing a thin and delicate skin. They disappear during the winter season.

Peter and Joseph Franck indicate a difference of appearance in the spots by the terms *ephelis umbrosa* and *ephelis lentigo*, the former referring to irregular brown patches, and the latter to circular yellow spots, somewhat resembling those of lentigo. Rayer introduces the mottled appearance seen upon the legs and thighs of women who sit over a charcoal brazier as a third variety, under the name of *ephelis ignealis.*

TREATMENT.—The treatment for sun-burn is the application of a liniment composed of equal parts of white of egg and olive oil; to which, if the heat of surface be considerable, may be added liquor plumbi, in the proportion of twenty minims to the ounce; an emulsion of bitter almonds with spirits of wine, or the benzoated ointment of oxide of zinc beaten into a cream with orange-flower water or elder-flower water. In the chronic stains called ephelis umbrosa, a lotion of the bichloride of mercury or nitro-muriatic acid will be found useful.

LENTIGO.

Syn. *Freckles.* *Epichrosis lenticula*, Mason Good. *Sommersprossen*, Germ. *Phacia*, Gr.

Lentigo has received its name from the lentil-shaped spots which characterize the affection; in popular language they are called *freckles.* Freckles are small, round, yellow, or greenish-yellow spots of various size, but rarely larger than the diameter of a split pea. They are seated in the rete mucosum, and most abundantly distributed upon those parts of the body which are exposed to the influence of the light, as the face, neck, hands, &c. On these parts they are sometimes assembled in thick clusters, forming unsightly patches of considerable size. They are also met with on those regions of the body which are usually protected by the dress; and are evidently dependent on some morbid action of the skin.

Lentigo is sometimes a congenital affection, appearing soon after birth, and continuing through life, or subsiding and disappearing at the age of puberty. Sometimes the spots vanish at other periods, and without appreciable cause. They are almost peculiar to persons of light complexion and hair, and are especially frequent in those whose hair is red.

The diagnosis between lentigo and ephelis is the permanence of the former, its independence of season, and its accustomed seat in the skin of persons of light complexion. Ephelis, on the other hand, commonly disappears during the winter, is excited by the sun's rays, and occurs in persons of all complexions.

TREATMENT.—The treatment of lentigo consists in the application of some moderately stimulating therapeutic remedy which may excite the skin to a more healthy function. The lotion of bitter almonds containing from five to fifteen grains of the bichloride of mercury to the half pint, is well adapted for this purpose. I have seen the liniment of lime-water and oil, with a small quantity of liquor ammoniæ, of use in this unsightly affection; a lotion of the bichloride of mercury with elder-flower water is also sometimes useful; or a lotion of borax and rose-water. Plenck recommends acetum armoraciæ; pasta amygdalarum amarum; fel taurinum; lac sulphuris; aqua phagædenica (yellow wash); and solution of sulphate of zinc. Fel taurinum is a favorite cosmetic remedy among the older physicians.

CHLOASMA.

Syn. *Pityriasis versicolor*, Willan. *Maculæ hepaticæ.* *Ephelis hepatica.* *Hepatizon.* *Leberflecke*, Germ.

Chloasma[1] is characterized by the development of one or more patches, of irregular form and size, and of a pale or saffron yellow, or brownish yellow color, upon any part of the surface of the body, particularly on the face, neck, and trunk. The seat of discoloration

[1] Vide, Portraits of Diseases of the Skin, Plate XXXV., A.

is the rete mucosum; it is accompanied by a slight degree of local irritation, and lasts from a few days to several months or years.

Chloasma first makes its appearance in the form of small spots, of a dull, reddish color, which increase in size, and present a yellow tint, approaching more or less to a saffron, or brownish yellow hue, or dead-leaflike tint. These spots are at first distributed irregularly upon the cutaneous surface, they then enlarge and communicate with each other, so as to form patches of considerable extent. Indeed, the patches are sometimes so extensive that they may be mistaken for the sound skin, while the intervening parts of the natural hue may be regarded as the discolored integument. They are frequently developed without accompanying symptoms; at other times, they are attended with considerable itching, which continues throughout their course, and gives rise to great annoyance. The pruritus is increased by mental emotion, by impending catamenia, by stimulating food or drink, and by the warmth of bed, and is often exasperated at the latter period to such a degree as to deprive the sufferer of sleep. When the disease subsides, desquamation of the epidermis ensues, and is repeated several times after the total decline of the symptoms.

The symptoms above detailed apply to chloasma when recent and in an active state; when chronic, it gives rise to very little inconvenience. Its location on the skin offers some little variety. In women, I have generally observed it on the front of the chest, on the abdomen, pit of the stomach, groins, and bends of the arms; in men, it seems most frequently to occupy the abdomen, running upwards along the sides of the trunk to the armpits and back of the neck, and downwards into the groins and inner parts of the thighs: it is also commonly seen around the neck, becoming blended above with the deeper color of the face. In one gentleman, it affects also the bends of the elbows; and, in another, is situated only on the back, extending downwards on the trunk to the waist. On examination with the lens, there is a conspicuous alteration and elevation of the skin, and a mealy and pulverulent desquamation resulting from the fact of the hyperpigmentous cells being more friable and less adapted to assume the condensed character than the scales of healthy epidermis.

Diagnosis.—There is little danger of mistaking chloasma for any other cutaneous affection; its yellow color, the troublesome pruritus, and the mealy epidermal exfoliation, are its characteristic signs. In pityriasis there is a more altered and rougher state of the skin, a greater degree of redness, a mixture of soreness with pruritus after scratching, and larger scales.

Causes.—Chloasma may occur at all ages, and in both sexes, but is most frequent in women, and particularly in those who possess a fair and delicate skin. The usual cause of the affection in females is uterine irritation, induced by impending catamenia, amenorrhœa, (maculæ amenorrhœicæ), pregnancy (maculæ gravidarum), &c. It is by no means uncommon to observe chloasma a short time previously to the appearance of the catamenia, but the disease ceases as soon as the latter are established. In like manner the affection sometimes lasts through a considerable period of pregnancy, invading at

its commencement and terminating in its course; or commencing at a later period, and ceasing after the completion of parturition. Other exciting causes of chloasma are, gastro-intestinal irritation, stimulating food and drinks, hepatic irritation; irritations, in fact, which are due to a morbidly sensitive state of the solar plexus of nerves.

Dr. Gustav Simon places chloasma in his sixth group of diseases of the skin, which he entitles *Parasites;* considering this eruption as depending, like favus, sycosis, and alopecia circumscripta, on the presence of a parasitical vegetable fungus. I do not agree with him in this opinion; and have failed to discover any vegetable organisms, although I have searched for them with care; and have seen what has been mistaken for them.

TREATMENT.—Chloasma gives way without much difficulty to the nitro-muriatic acid with gentian, conjoined with a mild aperient; and the local application of a lotion of the bichloride of mercury in emulsion of bitter almonds, two grains to the ounce. Indeed, it seems to yield to almost any stimulant, such as the nitro-muriatic acid lotion, the nitric oxide of mercury ointment, or sulphur ointment. But it is apt to return, and constitutional remedies are necessary to alter and improve the functions, upon whose failure of proper action this affection depends. I have seen it get well under small doses of the bichloride of mercury; and have sometimes found it necessary to have recourse to Donovan's solution, or one of the arsenical preparations. It is perfectly curable.

MELASMA.

Syn. *Pityriasis nigra*, Willan. *Der Schwarze Flecke.*

Melasma is an alteration of the chromatogenous function of the skin analogous to chloasma, and differing from the latter only in the darker color of the abnormal pigment. Melasma is a rare disease, and has been chiefly observed in persons of weakly constitution. It makes its appearance in the form of blackish patches, of irregular size, upon one or several parts of the body. The affected skin is dry and granular to the touch, and the epidermis cracks and desquamates in furfuraceous scales. On the fall of the morbid epidermis, the newly-formed membrane usually presents the normal tint.

Willan observed this affection in children born in India, and brought to this country, and regarded it as a variety of pityriasis; *pityriasis nigra.* In Willan's cases the disorder "commenced in a partially papulated state of the skin, and terminated in a black discoloration, with slight furfuraceous exfoliations. It sometimes affected half a limb, as the arm or leg, sometimes the fingers and toes." Alibert describes and delineates it as a discoloration of the skin, under the name of "ephelide scorbutique;" and Rayer assigns to it the title under which it is considered in this place. The latter author remarks on its frequent occurrence in association with pellagra,

and observes, that it "appeared among a certain number of individuals of both sexes, and of all ages, in the epidemic of Paris in 1828."

The same characters which distinguish chloasma from pityriasis form the principal diagnostic characters of this disease; substituting the yellow tint of the former for the black of melasma.

TREATMENT.—The indications for treatment are the same as in chloasma.

IV. CHEMICAL COLORATION OF THE DERMA.

DECOLORATIO ARGENTEA.

Persons who have taken nitrate of silver for a certain length of time are liable to be affected with alteration of color of the skin. In the first instance, this alteration consists in the suffusion of the surface with a bluish tint, which subsequently becomes of a greenish slate color. The discoloration takes place upon all parts of the surface of the body at the same time, but is most remarkable in those regions which are exposed habitually to the influence of light, as the face and hands; and, in the latter situations, it not unfrequently assumes a more or less deep black. The color is curiously modified in certain localities by admixture with red; hence, in the conjunctiva, and on the lips, it presents a livid brown tint, and on the general surface it is much deepened by those causes which, under other circumstances, would produce pallor; for the same reason the discoloration is more apparent upon persons naturally pale than in those who possess a fresh complexion.

Once established, the discoloration produced by nitrate of silver lasts for the entire life of the individual, without alteration. In some few instances only, it has been observed to diminish slightly in the course of years.

TREATMENT.—Few persons afflicted with this deformity would feel disposed to endure it calmly, without making some attempt at its removal; hence, it becomes necessary to inquire what remedies might be employed with the best chance of a successful result. The iodide of potassium has been proposed for this purpose; and, as in moderate doses it is a safe remedy, it deserves a trial, and may be continued for a length of time. Its known powers of removing nitrate of silver stains from the surface of the skin, are suggestive also of its use as a local application. For the same reason a lotion of the bichloride of mercury, with or without the hydrochlorate of ammonia, is a judicious remedy.

CHAPTER XX.

DISEASES AFFECTING THE SPECIAL STRUCTURE OF THE SKIN.

DISEASES OF THE SUDORIPAROUS ORGANS.

Our knowledge of the existence and nature of the sudoriparous system is comparatively recent. It was first made known by the researches of Purkinje, Breschet, and Roussel de Vauzeme, and their discovery has thrown much light on the pathology of the sudoriparous organs. It had long been observed by dermatologists, that the perspiratory secretions may become morbidly augmented without fever, and without apparent visceral disease, a disorder which has been termed *ephidrosis*. The sweating sickness which prevailed in England during the sixteenth century, and which still continues to make its appearance from time to time in France, receives much elucidation from our knowledge of the anatomy and physiology of the sudoriparous organs. The observation of this function will probably discover to us also certain morbid phenomena, which may be referred to deficiency of perspiratory secretion, and numerous instances are recorded of alteration in the physical properties of the secretion. So that the diseases of the sudoriparous system may be referred to the three heads which are generally applicable to secreting organs, namely,

Augmentation of secretion,
Diminution of secretion,
Alteration of secretion.

I. AUGMENTATION OF SECRETION.

IDROSIS.

Ephidrosis profusa, Mason Good. *Hyperidrosis*, Swediaur.

Idrosis[1] is an excited action of the sudoriparous glands, attended with symptoms which indicate inflammatory determination. It is characterized by excessive perspiration, the perspiratory secretion being altered in its qualities; by more or less redness of the skin; by heat and tingling or itching; and by shooting and lancinating pains. When the disease is general and acute, it is attended with febrile symptoms, and often with the development of serous vesicles, or sudamina (page 208).

Idrosis presents two principal varieties, namely,

Idrosis simplex, Idrosis maligna.

[1] Der. ἱδρώς, sudor.

IDROSIS SIMPLEX.

Syn. *Ephidrosis. Sudatoria simplex. Sudatoria miliaris. Miliaria. Miliaria rubra. Miliaria alba.*

Simple idrosis is a subacute affection, sometimes general, but more frequently partial in its attack. When general, it is apt to be accompanied, after the lapse of three or four days, with sudamina, constituting that form of the disorder termed *sudatoria miliaris.* These vesicles first make their appearance on the neck, then on the trunk and abdomen, and then on the skin of the armpits, and inner sides of the thighs. The disorder is accompanied by febrile symptoms, and torpor of the alimentary canal, and its sudden arrest is sometimes followed by visceral congestion. Subacute idrosis usually terminates in a week or a fortnight.

During the excessively hot weather which occurred in the early part of August, 1856, I had occasion to treat several cases of idrosis. The symptoms were these: after taking food, and sometimes without the stimulus of food, as during the night, the patient was suddenly seized with a feeling of faintness and oppression at the epigastrium; a profuse cold perspiration immediately bedewed the whole surface of the skin, and continued for a space of time, varying between a quarter and half an hour. In some instances these symptoms were repeated at every meal, in others only once in the day, at dinner or supper, and gave rise to considerable exhaustion and debility. I saw about ten cases, and one was followed by vomiting and slight fever. I prescribed quinine with sulphuric acid, and cooler weather setting in, the patients soon got well.

Chronic idrosis is less apt to give rise to constitutional symptoms, and to the production of miliary vesicles. "M. Dupont has published an account of a curious case of a chronic general ephidrosis which lasted upwards of six years. The woman who was thus affected became pregnant during this time, and was happily delivered of an infant, which she nursed herself. This ephidrosis, which, according to him, was independent of any other affection, after having been fruitlessly combated by various remedies, yielded at last to extract of aconite, given at first in doses of half a grain, and gradually raised till sixteen grains a day were taken."[1] "Hoffman makes mention of a very old man, subject to continual perspiration, so that his whole nourishment passed through the pores." And Willis notices the case of a lady "whose perspirations were so prodigious," that basins were set beneath her "to receive the trickling humor."

Partial idrosis (ephidrosis partialis) is more common than the general form; sometimes it is confined to the feet or hands alone, at other times to the axillæ, perineum, or scalp, and "Hartmann cites the singular fact of a woman who, during pregnancy, perspired only on the right side of her body."[2] I have, at present, under treatment,

[1] Rayer, Translation, page 920. The extract of aconite here referred to is much inferior in strength to the English alcoholic extract, of which the dose is $\frac{1}{8}$ to $\frac{1}{2}$ a grain.

[2] Rayer, *loc. cit.*

a young lady, whose hands are the seat of this disagreeable affection; under the influence of a slight nervous excitement, the hollow of the palms fills with secretion, and the perspiratory fluid drips from her fingers as she stretches them out. A gentleman whom I attended lately for severe gastric disorder, called on me one morning, with rills of perspiration running down one side of his forehead and face, the opposite side being perfectly dry; and an eminent actor told me the following anecdote of himself: When a young man, starring in America, he had one night, in the summer time, been playing in a tragedy, in which he was violently heated, and had scarcely time to cool, when he was obliged to come on the stage again as Sir Archy MacSarcasm, in Macklin's comedy of Love à la Mode. The make-up for this character required that he should convert his features, by means of paint, into those of an old man. In the course of the play he was struck by perceiving himself "the cynosure of neighboring eyes," particularly those in the front rows of the pit, and concluding that it must be the excellence of his acting which was attracting so much attention, felt highly flattered, and exerted himself to the utmost. From time to time, however, he was startled at the bursts of laughter and applause falling in the wrong places, and was thoroughly puzzled at the unusual sensation he was creating. On retiring to his dressing-room, after making his best and most grateful bow to an hilarious audience, the mystery was explained; it was not his brilliant acting *alone* which had brought down such noisy honors on his head, but the drollery of his face, one-half of which was washed clean of its wrinkles by partial perspiration, and displayed the juvenile features of twenty; while the other half exhibited the careworn lines and withered seams of eighty. In his case, while one-half the face was affected in this peculiar manner, and the other half was dry, his chest was acted on in a precisely opposite way, the perspiratory side being reversed. At a later period of his life the perspiratory action ceased over the entire body, and, as a consequence, he suffered bitterly in his health.

The perspiration in idrosis is acid, disagreeable in odor, and so profuse as to produce softening and opacity of the epidermis, which, on the soles of the feet, is often corrugated, like that of washerwomen. The disease is most commonly met with in the summer season, occurring during extreme heat, excessive exercise, &c.

IDROSIS MALIGNA.

Sudatoria Maligna.

The malignant form of idrosis appears to correspond with the sweating sickness of the sixteenth century, a disorder which is no longer met with in England, but which would seem by the numerous reports made to the Académie de Médecine, to be still prevalent in France. The disease is infectious and contagious, and occurs epidemically. The following brief notice of the disorder is an abstract of the description given by Rayer.

Malignant idrosis is commonly associated with inflammation of the stomach and intestines; inflammation of the lungs; inflammation of

the bladder; or inflammation of the cerebro-spinal axis. When the digestive organs are especially affected, the disease is characterized from the commencement, or at an early period, by a severe constriction at the epigastrium, spasm of the diaphragm affecting respiration, distressing anxiety, deeply drawn sighs, feeling of weight in the chest, with a sense and alarm of suffocation, and, in some cases, vertigo, violent headache, and nausea. When the lungs are the seat of inflammation, there is a deeply-seated pain in the chest, crepitating rattle in the bronchi, oppressed breathing, frequent full pulse, and sanguinolent expectoration. When the bladder is inflamed, there are pains in the hypogastrium, difficulty in passing the urine, with high color and deficiency of that secretion. And when inflammation of the cerebro-spinal axis is present, there is headache, flushed countenance, full, starting eyeballs, throbbing temples, contracted or fixed pupil, coma, and convulsions.

These symptoms occasionally prove fatal in twenty-four or forty-eight hours, or the disease may run on for two or three weeks.

The following cases of idrosis were observed by M. Marrotte, in the Hôtel Dieu, at Paris, at the close of an epidemic of typhus fever, which raged in that city in 1842. M. Honoré, in whose ward the patients lay, had never before seen cases of this disease; and M. Rayer, who is well acquainted with the disorder, had never seen it in Paris.

A young man, twenty-three years of age, was received into the hospital July 29, complaining of pain in his head, lassitude, great prostration, thirst, and drowsiness. His skin was hot, pulse frequent, tongue and teeth foul; had had no action of bowels, which could only be brought to move by medicine; no rumbling in the iliac fossæ. There were none of the lenticular spots which accompanied the prevailing epidemic. The skin, though very hot, was neither dry nor burning; on the contrary, it was moist. He complained, moreover, of an uneasy sensation and feeling of anxiety at the pit of the stomach, which led to the administration of an aperient emetic.

The present symptoms have lasted three days. His first indications of disease were, general uneasiness and loss of appetite, but not sufficiently pressing to induce him to relinquish his duties. Suddenly, in the middle of the day, he was seized with pain in the head and great prostration, which forced him to take to his bed; but he had no rigors, no diarrhœa; his skin was at the same time covered with a moderate, though constant, perspiration.

For two or three days after admission the patient continued in the state above described, without having been benefited by a bleeding from the arm, practised previously to his application at the hospital. After this period the disease assumed all its severity, the prostration and drowsiness were more marked, the perspirations and oppression became more intense. The perspiration streamed forth continually from the skin, the heat of skin increased, the pulse became stronger, and more frequent; the oppression was accompanied by cough and mucous expectoration; and auscultation discovered mucous crepitation throughout the whole extent of the bronchi.

This combination of symptoms persisted in all their force for ten or twelve days; at the expiration of that period the patient felt improved. His amendment seemed in some degree to have been effected by a change in the position of his bed to a better ventilated situation. Under the influence of this change of position, the perspirations diminished, the tongue became soft, moist, and simply furred, the teeth became clean, and the thirst was diminished.

On the 25th of August the patient is progressing; the surface is still moist in situations where the skin is naturally perspirable. Vesicles are dispersed about the neck and trunk, some being filled with a milky serum, and surrounded by a slight areola; others being transparent. The return of appetite is more tardy.

A second case was that of a man, upwards of six feet in height, thirty years of age, who had felt, every evening, a sensation of feverishness, for about twelve days; his appetite failed; he suffered from thirst; his skin felt burning hot, and he experienced considerable drowsiness. Since his admission, the fever has become increased and continued; his skin is covered with a constant perspiration; he has headache, pain in the left side, anxiety, and oppression at the præcordia.

In the course of five or six days, the anxiety and oppression have assumed an excessive degree of intensity; he has cough and expectoration, and mucous râles are very obvious throughout the whole of his chest. The perspirations have increased, together with the heat of skin, and the hardness and frequency of the pulse. The abdomen is distended, the tongue thickly furred; there is great prostration and perpetual drowsiness. An eruption of red pimples appeared upon the neck, and spread thence to the face and trunk; in two or three days these pimples were surmounted by vesicles, containing a lactescent fluid, and were followed by successive eruptions of sudamina, chiefly of the phlyctenoid kind, which occupied the vacant spaces between the papulæ.

As the eruption increased, and advanced in development, the oppression decreased, the pulse became softer, and the abdomen diminished in bulk. In this patient, as in the former, the bowels were inactive, and required the aid of medicine. His intellectual powers were unaffected, and the appetite returned gradually to its normal standard during recovery. On the 25th of August he was convalescent.

In a third case, the patient was a young man, twenty-four years of age; he had for some time suffered from uneasiness, loss of appetite, and lassitude, for which symptoms he was bled from the arm without benefit. He was next seized with headache, vomiting, diarrhœa, and perspirations, and was forced to take to his bed, where he remained for eight days, suffering with perspirations during the whole period.

On admission, August 16th, he was in a state of extreme prostration; heaviness was exhibited in his features, his tongue and teeth were covered with sordes, the perspirations were general and continual; his abdomen was distended, and he suffered from thirst. For several days he remained in this state, answering with difficulty the

questions that were put to him. He had retention of urine, and a full basin of clear urine was withdrawn by the catheter. In seven or eight days from this time, his state was improved; the stupor has diminished, and the tongue is moist. The perspirations are mitigated, and this mitigation became strikingly apparent as soon as the patient was removed to a better ventilated situation. They have not yet, however, wholly ceased; the hardness and frequency of the pulse have yielded.

From this period, amelioration was as speedy as in the former cases, but the return of appetite was not so marked as is customary after typhus fever; he was not so much emaciated as are patients convalescent from the latter disease, but he appears more debilitated.

M. Marrotte remarks with regard to these cases, on the exacerbation which took place at the close of the fifth or sixth day; the continuous perspirations which existed at that period both day and night; the intensity of the prostration and drowsiness; the cutaneous eruption which at this period made its appearance, but without being critical; the oppression and anxiety at the præcordia appearing with the perspirations; the protraction of amendment to the term of two weeks from invasion; the continuance of perspirations to the close of the third week, and the marked benefit resulting from better air and ventilation; all of which symptoms he looks upon as pathognomonic.

Contrasting the disease with typhus fever, he recalls the negative characters of sudatoria. There was no diarrhœa in the commencement; there were no headache, rigors, or vomitings; the prostration of the physical powers is rarely so great; it is rare that the tongue and teeth are so speedily covered with sordes, or that drowsiness is so strongly marked. The first week passed away without epistaxis, and without lenticular spots. The pulse of sudatoria, again, has never the smallness and frequency of the pulse of typhus.

Treatment.—The indications for treatment in idrosis are, to restore the secretions, to allay the irritation of the inflamed perspiratory organs, to restore tone, and to engage with local congestions as they arise. The first of these indications is effected by means of abstinence, diluents, and the ordinary antiphlogistic remedies. The second calls for the use of the tepid bath. The third is met by quinine, salicine, and the mineral acids. The fourth may require general or local bleeding, blisters, mustard plasters, mustard foot-baths, &c.; these remedies being employed according to the seat, and in proportion to the severity of the symptoms. The suggestion of M. Dupont, relative to the extract of aconite, is worthy of recollection. A sulphureous bath is recommended by Rayer; and, in chronic cases, sulphureous vapor might be found useful.

After regulating the secretions, tannin will be found a valuable remedy in these cases. I have employed tannin in idrosis of the feet, with considerable advantage, conjoining with it chloride of lime, as a lotion for local application. A strong solution of alum is also serviceable, as is also a spirituous solution of the juniper tar; and I once saw a gentleman who informed me that he had relieved himself

of this discomfort by the use of a brine foot-bath every night. Panarolus, remarking that perspiration of the feet doth very much torment people, continues, "for which I can tell them a speedy remedy; namely, if they put some powder of myrtle into their linen socks; but let them have a care they fall not into worse diseases by the cure of this, as I have often seen; for this excretion preserves from many diseases, and should rather be promoted than any ways checked."

II. DIMINUTION OF SECRETION.

ANIDROSIS.

Diminution of perspiratory secretion from arrest of function of the sudoriparous glands has hitherto been observed only in relation with febrile diseases. It is probable, however, that the perspiratory secretion, like that of other secerning glands, may be diminished and checked as a consequence of inflammatory disorder of the sudoriparous glands, independently of the rest of the organism. The dryness of skin which we occasionally meet with in some individuals bears no reference to the sudoriparous system, but is dependent on the absence of secretion of the sebiparous glands. In the Philosophical Transactions[1] is recorded the case of a "gentleman near Leyden, who, being much addicted to the study of astronomy, and spending very many nights in star-gazing, had, by the nocturnal wet and cold temper of the air, in such manner obstructed the pores of his skin, that little or nothing exhaled from his body; which appeared hence, because that the shirt he had worn five or six weeks was then as white as if he had worn the same but one day."

III. ALTERATION OF SECRETION.

OSMIDROSIS.

Ephidrosis olens, Mason Good.

Alteration in the physical properties and chemical composition of perspiration is coexistent with augmentation of secretion, and may also occur independently of increase in quantity. The most apparent alteration in physical properties is that which relates to odor, osmidrosis.[2] The perspiration frequently assumes an acid smell, probably from containing a larger proportion than usual of acetic acid, or a rancid odor from excess of butyric acid, or a combination of both, constituting a fetid and disagreeable odor, which has been aptly compared by Rayer to the smell of "rotten straw." The same author remarks, "I had a woman under my care in the Hôpital de la Charité, affected with chronic peritonitis, and who, some time before her death, exhaled a very decided odor of musk: the pupil who called my attention to this circumstance had observed the smell for several days while dressing a blister, but thought it owing to a bag of musk put pur-

[1] Abridgment, vol. iii.

[2] Der. ὀσμή, odor.

posely into the bed to overpower other bad smells.[1] The woman, however, assured us that she had no description of perfume about her, and I satisfied myself that her linen, which was frequently changed, was not impregnated with any perfume before being delivered to her from the laundry of the hospital. The odor of musk, the existence of which was fully ascertained by myself and several physicians, and which was very perceptible on the arms and other regions of the body, did not become more powerful from rubbing. After continuing for about eight days the smell became fainter, and nearly vanished the evening before the patient's death." Speranza[2] relates a similar case. Schmidt has inserted in the *Ephemerides Naturæ Curiosorum* the account of a journeyman saddler, three and twenty years of age, of rather robust constitution, whose hands exhaled a smell of sulphur so powerful and penetrating as very soon to infect any room in which he happened to be. I was once consulted by a valet de chambre, who could never keep a place in consequence of the unpleasant odor he left behind him in the rooms which he had been occupied in cleaning. There have been instances of individuals who, to obtain their discharge, or immunity from military service, have simulated these offensive perspirations, by rubbing their axillæ with the animal oil of dippel, assafœtida, a piece of much-decayed cheese, putrid fish, &c.

Another author observes, "the sweat of persons with the itch is said to have a mouldy odor, while that of syphilitic patients is said to smell sweet. The sweat of rheumatic and gouty persons has an acid smell, while in putrid fever and scurvy it has a putrid odor; in jaundice it is said to resemble musk in its smell. In Stark's *General Pathology* we find it stated, that the odor of the sweat in scrofula resembles that of sour beer, while in intermittent fever it smells like fresh-baked brown bread." "Anselmino found free acetic acid in the sweat of women during their confinement; and, according to Stark, the quantity of free lactic acid is increased in the sweat during scrofula, rachitis, and certain cutaneous eruptions." "Anselmino found a larger proportion of ammonia in the sweat after an attack of gout than in any other case. Behrend states that the sweat in putrid and typhus fever is ammoniacal, and in nervous diseases, according to Nanche, it becomes alkaline. All sweat with a putrid odor probably contains free ammonia.

[1] Mason Good observes, that the odor of musk, although not often thrown forth from the human body, "is, perhaps, the most common of all odors that escape from the skin of other animals. We discover it in many of the ape kind, and especially in the *simia jacchus;* still more profusely in the *opossum*, and occasionally in *hedgehogs*, *hares*, *serpents*, and *crocodiles*. The odor of civet is the production of the civet-cat alone, the *viverra zibetha*, and *viverra civetta* of Linnæus, though we meet with faint traces of it in some varieties of the domestic cat. Among insects, however, such odors are considerably more common, and by far the greater number of them are of an agreeable kind, and of very high excellence; for the musk scent of the *cerambix moschatus*, the *apis fragrans*, and the *tipula moschifera*, is much more delicate than that of the musk quadrupeds; while the *cerambix suaveolens*, and several species of the *ichneumon*, yield the sweetest perfume of the rose; and the *petiolated sphex*, a balsam ether highly fragrant, but peculiar to itself." Vol. v. p. 551. Second edition.

[2] Observation d'odeur aromatique exhalée par la peau de l'avant-bras. Archives Générales de Médecine. Vol. xxx. p. 399.

In cases of gouty and urinary concretions, the quantity of phosphate of lime appears to be increased."[1]

Dr. Piutti, of Elgersburg, has made some analyses of morbid sweat, the leading feature of which is the absence of the salts of lime. Simon thinks that the phosphate of lime appertains to the epidermis, while Berzelius, more correctly, in my opinion, believes it to be a constituent part of the secretion, and held in solution by a free acid. Piutti omits all notice, likewise, of sulphuric acid and potash. The three analyses made by Piutti are as follows:

	1.	2.	3.
Water,	995.5	993.0	994.6
Chloride of sodium,	3.0	4.0	3.3
Phosphate of ammonia,	.5	.8	1.1
Acetate of ammonia,	.5	.6	.5
Hydrosulphate of ammonia,	trace	—	trace
Extractive matters,	.5	1.6	.5
Specific gravity,	1003.5	1004	1003

The first was from a man aged thirty-six, suffering from atonic gout; the second was also from a patient with gout; and the third from a girl of twenty-two, laboring under paralysis of the lower limbs.

Of the abnormal constituents which have been found in the perspiratory fluid are, albumen in rheumatic fever, gastric, putrid, and hectic diseases, and also on the approach of death; blood, uric acid, bilin and biliphæin, uro-erythein, and fat. "The following substances enter into, and have been detected in the sweat: quinine, sulphur, mercury, iodine, iodide of potassium, assafœtida, garlic, saffron, olive oil, rhubarb, indigo, Prussian blue, and copper."[2]

TREATMENT.—I have several times been consulted in cases of osmidrosis, and have succeeded in relieving my patients from a most distressing malady, by a plan of treatment directed to regulate the secretions and other functions of the body. In one case, where the general means had failed, tannin effected a perfect cure. Locally, the chloride of lime lotion, or a solution of the permanganate of potash (Condy's fluid) will be found of service.

CHROMIDROSIS.[3]

Ephidrosis discolor, Mason Good.

Numerous instances of abnormal coloration of the perspiratory secretion are scattered through the works of the older medical writers, and through the various periodicals. Cases of blue perspiration[4] have

[1] Simon's Animal Chemistry, vol. ii. p. 108.

[2] Simon quoted from Stark's General Pathology, p. 1127; and Baumgärtner, Elements of Physiology and Therapeutics, p. 486.

[3] Der. χρῶμα, color.

[4] Conradi. Blue perspiration of one-half the scrotum, Anat. p. 292. Lemery, Histoire de l'Académie des Sciences, 1701. Fontenelle, sur les sueurs bleues; Journal de Chimie-médicale, vol. i. p. 330. Billard, Frorieps Notizen, No. 32. Dr. Bleifuss in Wurtemburg Medical Correspond. Blatt. 1835. No. 26. The occurrence of blue pus has been noted by several observers; amongst others, by Dr. Apjohn, of Dublin, and Dr. Olioli. Dr. Apjohn considered the color to be occasioned by the presence of Prussian blue. In Dr. Olioli's case, M. Bouchardat detected an organic coloring matter of unknown nature. Dr. Semmola has recorded two cases of blue urine. The coloring principle of blue perspiration is probably of a similar nature.

been recorded by several authors. Green perspiration[1] has also been observed, as have those of a saffron and ruby color. The rarest of the discolorations of the perspiration seems to be that in which the secretion is yellow.[2] Black[3] is not so uncommon; it was probably of the same nature as the disorder described in a future page of this work, under the name of stearrhœa nigricans.

In a case of green perspiration recorded by Mr. Pritchard,[4] of Leamington, the cause was ascertained to be the accidental exhibition of copper with the food, the food having been prepared in a copper vessel plated with tin, from which a portion of the tin had been rubbed away. The subject of the affection was a young lady of fourteen, who "had for some months evinced much general debility." She was then "seized with an attack of rheumatic fever, which yielded to remedies slowly and unsatisfactorily. After some days, during which the perspiration was considerable, my attention was called to a collection of light green perspiration between the toes, and underneath the nails of the young lady's feet, whilst the same appearance was observable in a fainter degree on the upper, but more especially the under surface of the foot."

TREATMENT.—I have never seen a case deserving of being considered as one of chromidrosis. Were such a case to present itself, I should not doubt of being able to restore the healthy functions of the skin, by regulating the general health, and using stimulants locally.

HÆMIDROSIS.

Ephidrosis cruenta, Mason Good. *Bloody sweat.*

The most common of the morbid discolorations of the perspiration are those of a red hue, which probably owe their peculiar tint to the coloring principle of the blood; hence they appear to me to call for separate consideration. Landerer[5] observed a red perspiration which flowed from the axilla of a patient laboring under fever. Voigtel, also, has noticed an instance of sanguineous perspiration.[6] M. du Gard has recorded the case of a child three months old, that was "taken with a bleeding at the nose and ears, and in the hinder part of the head, which lasted for three days, and afterwards the nose and ears ceased bleeding, but still bloodlike sweat came from the head. Three days before the death of the child, which happened the sixth day after it began to bleed, the blood came more violently from its head, and streamed out to some distance. It also bled on the shoulders and at

[1] Borellus, Hist. et Obs. Med. Phys. Cent. 2. Observatio 54. Paullini Cent. 1. Observatio 38. John Peter Franck, De curandis hominum morbis. Landerer mentions an instance of green milk, secreted by the peripheral lobules of the mammary gland in a pregnant woman.

[2] Ephemerid. Nat. Cur. Dec. 1. Ann. 6 et 7. Obs. 78.

[3] Bartholinus, Acta. Hafn. 1. Obs. 70. Ephemerid. Nat. Cur. Dec. 1. Ann. 2. Obs. 19.

[4] London Medical Gazette, vol. ii. p. 211. 1833.

[5] Buchner's Repertorium, 2d Series, vol. v. p. 234, quoted by Simon.

[6] Stark's General Pathology, p. 113).

the waist." "It bled also for three days at the toes, at the bend of its arms, at the joints of the fingers, and at the fingers' ends."[1]

The greater number of cases of effusion of blood, or of a sanguineous fluid from the skin, occur in young women, and are referable to vicarious menstruation. I once saw a young lady, in whom a discharge of this nature took place every fortnight from four circular spots, each about the size of a half-crown, and situated symmetrically on the face; one being on each cheek, one on the forehead, and one on the chin. And more recently I have seen another young lady of highly nervous temperament, whose face would become in a few hours covered with blotches of blood without any lesion of the surface. When I sponged away the blood the skin looked congested and erythematous. In the "medical cases" above quoted, a young woman of eighteen suffered a loss of blood from "her ears, a little after at the points of her fingers, and then at her toes; presently after, at the umbilicus and corner of the eye; several times by sweat; and at length it burst out from the middle of her breast; afterwards in the foot, where the saphena is pricked in bleeding; then at both palms and back of her hands. Two days after, it flowed from her chin, and in the night-time from the tip of her tongue, and all this in a fortnight's time." Whenever it flowed from her "breast or other parts like sweat, there was no vestige of an orifice to be seen."[2]

Mason Good remarks, that ephidrosis cruenta, which he defines as "cutaneous perspiration intermixed with blood," has "taken place occasionally during coition;[3] sometimes during vehement terror, and not unfrequently during the agony of hanging or the torture.[4] It is said also to have occurred in some instances in new-born infants,[5] probably from the additional force given to the circulation, in consequence of a full inflation of the lungs, accompanied with violent crying."

TREATMENT.—The treatment of hæmidrosis depending on a hemorrhagic diathesis, must be regulated according to the various indications which present themselves. When the cause is imperfect uterine function, the treatment must be the same as for amenorrhœa.

[1] Medical Essays, abridged from the Philosophical Transactions, vol. i. p. 52.

[2] Landerer mentions an instance of red milk secreted by a woman suffering under suppressed menstruation.

[3] Paulini, Cent. 3. Obs. 46. Ephemerid. Nat. Dec. 2. Ann. 6. Appendix, pp. 4, 45, 55.

[4] Bartholinus, Epistola, i. p. 718.

[5] Ephemeridæ naturæ curios: Dec. 2. Ann. 10. Obs. 65.

CHAPTER XXI.

DISEASES AFFECTING THE SPECIAL STRUCTURE OF THE SKIN.

DISEASES OF THE SEBIPAROUS ORGANS.

THE sebiparous glands are subject to the same pathological laws that govern other secreting glands. The secretion may be increased, diminished, or altered, without manifest disease of the structure of the glands and their excretory ducts. Fourthly, the altered secretion may be accompanied by distension of the tubular structure of the glands and of their related hair-follicles. Fifthly, the glands, with their immediately adjacent tissues, may be the subject of inflammation, the secretion being at the same time more or less altered. Sixthly, they may be the subject of carcinomatous disease, constituting a malignant tubercle. And in addition to these changes affecting the function of the glands, their structure may also undergo a pathological alteration.

The *follicles* of the skin, with their excretory apertures, the *pores*, belong equally to the sebiferous and to the capilliferous system. Observation of the mode of development of these organs has shown that the formation of the follicle precedes that of the hair, and in like manner that the sebiparous gland is an offset from the neck of the follicle; and further, that the sebiparous gland is not unfrequently composed of lobes which constitute a kind of frill around the neck of the follicle at no great depth from the aperture of the pore. These points of anatomical detail must be fixed in the mind for the proper understanding of a morbid affection, a peculiar alteration in the structure of the follicles, presently to be described.

Again, the follicle is known to be composed of two parts, a vascular portion constituting part of the structure of the derma, and an epithelium, which belongs to the economy of the epidermis. It is perfectly consistent with analogy, that these two parts may be separately influenced by morbid action, and that alterations of structure may take place that may be referable to one or other of them. Two such alterations I have noted as occurring in the epithelium of the follicles; and as one of the two involves especially the epithelium of the sebiferous glands, I have selected the present chapter for their consideration.

It is easily demonstrated that the epidermis forms a solid conical process which occupies the mouth of the dermal portion of the follicle. It is this solid cone of epiderm that gives transparency to the summit of the papula of lichen, and suggests the idea of the presence of a fluid. Normally this epidermal cone is not visible from the exterior; but a case at present under my treatment offers the singular phenomenon of an hypertrophy of the epidermal cone, and its projection

above the level of the surface, as a prominent papule of considerable dimensions. This morbid affection exists in a gentleman in good health, and occupies the upper extremities, principally the forearms, where the skin is studded over with some hundreds of horny papulæ, hemispherical in figure, yellowish in color, smooth, transparent, and extra-vascular, each papula presenting on its summit the aperture of a pore. The epidermis in this case is perfectly normal in structure; and the disorder appears to me to be fittingly represented by the term,—*papular hypertrophy of the epidermis of the cutaneous follicle* (papulæ epidermicæ vel epidermidis). The part of the epidermis specially constituting the morbid phenomenon is not the rete mucosum, but the horny layer.

Another disorder of the epithelium of the follicles of the skin is more common than the preceding, and involves chiefly its deeper layer, spreading when it reaches the surface into the rete mucosum of the epidermis. The pathological nature of this affection is an hypertrophy and altered color of the epithelium of the sebiparous gland and of its excretory tubuli. The epithelium is thicker than usual, of a spongy texture, and yellowish in color, and lifts up the tissues immediately around the pores into rounded papulæ of considerable size, which are sometimes discrete and sometimes coherent. The papulæ are smooth, hemispheroidal, sometimes flattened on the summit, perforated by the aperture of a pore, elastic, insensible, and of a buff or nankeen yellow color. To the eye they suggest the idea of a yellowish tubercular or cheesy matter deposited beneath the cuticle, but a puncture proves them to be solid and vascular, in consequence of the vascular parietes of the gland being carried upwards to the surface by the growth of the morbid epithelium. They have no tendency to suppurate or ulcerate, but remain permanently on the skin, sometimes increasing slowly in size. In pathological nature, these papulæ may be designated a *yellow hypertrophy of the epithelium of the sebiparous glands*, and are deserving of the title of *papulæ flavæ epithelii cutis*. In a gentleman, at present under my care, suffering from a chronic syphilitic affection of the tongue and palms of the hands, a crop of these papulæ flavæ are dispersed over the forearms, chiefly on the anterior surface; a few are developed on the backs of the hands; there is a small cluster of coherent papules on the point of the elbow, and several on the pinna of the ear. In my remarks on this case, I find that on his first visit to me I noted the eruption as a molluscum sebaceum; but further observation induced me to alter my opinion as to the nature of the disease, in accordance with the views now put forth.

The commonest situation of this affection is the integument of the eyelids (Plate XX., figs. 2, 3); and there the disorder more frequently appears as plates of irregular dimensions than as papulæ. It is in the eyelids that we most frequently have the opportunity of observing the extension of the morbid change in the epithelium to the rete mucosum; and it is there more or less extensive in its distribution. This disorder appears more commonly in women than in men; after the mid-period of life than in youth; and is commonly permanent.

It presents considerable variety in tint of color, being sometimes cream-colored, or a light buff, and sometimes of a bright golden yellow; it also offers some differences of surface, having reference to its discrete or confluent origin, and to a disposition to spread more or less actively to the neighboring rete mucosum. In the former case (fig. 3), it preserves its papular character, and has a granular appearance; in the latter (fig. 2), it is smooth. This affection was described some years since by Dr. Gull in the *Guy's Hospital Reports*, under the name of Vitiligoidea; the papular variety he called V. granulosa; and the smooth variety V. plana. The name was suggested by the discoloration of the skin in patches, but is not a happy designation, as the disorder has no relation to the disease termed vitiligo; the morphœa, which is a companion of elephantiasis. Following up the idea of papulæ flavæ epithelii cutis, as applied to the discrete variety, I should call the confluent kind, as it appears on the eyelids, *laminæ flavæ epithelii cutis*, and the granular and the smooth kinds might be distinguished as papulosæ or granulosæ, and planæ.

Dr. Gull believes he has traced some relation between this disorder and a morbid state of the liver; and the fact of the occurrence of the disease after the mid-period of life, and its association with an accumulation of yellowish and dusky pigment in the rest of the skin, are circumstances favoring this hypothesis. On the other hand I must remark, that I have twice seen it in young women in whom there was no symptom of torpid action of liver present. The most extensive case I have met with occurred in a young woman who was perfectly healthy in all her functions. Again, it is remarkable that the disorder is almost exclusively confined to women.

The *treatment* of this complaint suggests local stimulation, with a view to modify the innervation and nutrition of the skin; and constitutional remedies of an alterative kind. I succeeded in removing the disorder in one patient by the daily application externally of the compound tincture of iodine; and by the internal exhibition of Fowler's solution of arsenic; and I should recommend a trial of these remedies in similar cases. Generally, patients are little inclined to give themselves any trouble with regard to it, as it occasions no pain, and no inconvenience beyond its somewhat remarkable appearance.

I. AUGMENTATION OF SECRETION.

STEARRHŒA SIMPLEX.

Syn. *Sebaceous flux. Seborrhœa. Cutis unctuosa.*

Great diversity exists among individuals, in relation to the quantity of sebaceous secretion naturally poured out upon the surface of the skin. In certain instances we have occasion to remark a great increase of this secretion, particularly during the progress of constitutional affections in which the activity of the cutaneous circulation is excited. When this condition is present, the skin is bedewed with an oily fluid, which is especially abundant on the nose, face, and head, and upon all those parts of the body in which the glands are present in considerable

number. The augmented secretion, after continuing a variable length of time, gradually diminishes without requiring medical treatment, and without giving rise to any unpleasant symptoms, further than those which are necessarily associated with the unsightly appearance of a greasy skin. This affection may be often seen in persons otherwise enjoying excellent health, in whom an over-stimulating diet, or some slight disorder of digestion, can alone be assigned as a probable cause. At other times it depends on torpor of the skin, and is associated with general torpor of the whole system.

In more severe cases of the sebaceous flux, the skin is somewhat congested and thickened, the common apertures of the excretory ducts and hair-follicles are enlarged, and the secretion poured out spreads in considerable quantity on the epidermis. This profuse form of the disease is usually met with on the face, continues for a great length of time, and evinces no disposition to improve without medical treatment. Such cases are accompanied with pruritus, and often with severe shooting pains.

TREATMENT.—Attention to regimen, laxatives, alterative doses of mercury, tonics, the fulfilment of such peculiar indications as the state of health of the patient may offer. Locally, the free use of soap with astringent lotions, such as the bichloride of mercury lotion, with emulsion of bitter almonds; or the juniper tar soap.

II. DIMINUTION OF SECRETION.

XERODERMA.

The term xeroderma (ξηρὸς, aridus), or simply, dry skin, is intended to convey the idea of a condition the opposite of the preceding; an affection which is occasionally met with in elderly persons, and sometimes in children and adults. The natural consequence of diminished function of the sebiparous glands is a disagreeable dryness and harshness of the skin, with their usual accompaniments, cracking and desquamation of the epidermis. This state of the glands sometimes originates in neglect of personal cleanliness, but, in most instances, is due to natural predisposition. When the former is the cause, the bath, frequent ablutions with soap, and plentiful frictions with a rough towel, are the proper expedients for procuring relief. Indeed, in every case, frequent sponging of the skin and friction are advantageous.

When xeroderma exists in a more severe and complete state, it constitutes the affection known as ichthyosis, the fishskin disease.

XERODERMA ICHTHYOIDES.

Syn. *Ichthyosis vera; simplex; vulgaris; congenita; mollis; furfuracea; reticulata; nitida; serpentina. Lepidosis ichthyosis*, Mason Good. *Ichthyose nacrée. Fischschuppenaussatz*, Germ. *Fishskin disease.*

That diseased state of the skin to which the term ichthyosis, or fishskin disease, has been applied, is greatly confused in the writings of

different authors, from the want of a distinction between two obvious forms which the disease is apt to present. In one of these, to which I have given the term *xeroderma ichthyoides*, and which may very properly be called *ichthyosis vera*, the epidermis is the seat of the morbid alteration; while in the other, which I have termed *ichthyosis sebacea*, and which may also be denominated *ichthyosis spuria*, the morbid appearances are due to the presence of the sebaceous secretion altered in its quantity and quality, and deposited on the surface of the skin.

The characters of xeroderma ichythoides are, a general dryness and roughness of the skin; modified in appearance in different regions of the body. On the cheeks and forehead the epidermis is comparatively smooth, but presents a number of ragged edges, the result of constant exfoliation; around the mouth and eyelids, and on the neck, it is rough, and has a mealy or branny appearance, *ichthyosis furfuracea;* and on the rest of the body the breaking up of the epidermis corresponds with the direction and form of the lines of motion of the derma. The pores of the follicles, both sebiferous and capilliferous, are prominent from the accumulation within them of a dry hardened substance, of which a portion often projects beyond the level of the aperture. This desiccated substance is the epithelial lining of the follicle, altered in its character by the absence of its oleaginous element. The hair undergoes a similar change; it is either wanting altogether, or it is dry and brittle, and broken off on a level with the skin.

The texture of the skin exhibits throughout a state of defective nutrition; this is least conspicuous in the face, but is very apparent in the limbs, and particularly in the arms; and there is besides a marked deficiency of subcutaneous adipose tissue. The skin is sometimes thinner, and sometimes thicker than natural, sometimes soft, and sometimes hard. When soft it may be pinched up from the parts beneath in a remarkable manner, and in the different movements of the limbs is thrown into folds which have more the character of a loose vest than of a part of the body. When the skin is hard it cannot be pinched up, but it may be moved backwards and forwards on the subcutaneous fascia, as if there were no binding tissue between the under surface of the corium and the structures beneath; and, instead of falling into folds during the movements of the body, it remains stiff like leather, and seems to depend entirely upon the lines of motion for its power of adaptation to the movements of the joints. The lines of motion are therefore very strongly marked, and form deep grooves, while the inflexible areæ between them are large and smooth. The softer condition of the skin is met with on the neck, the limbs between the joints, the flexures of the joints, and the trunk of the body; the harder condition on the hands and feet, and the convexities of the joints.

In a case which I have illustrated among my *Portraits of Diseases of the Skin*,[1] the subject was a little girl between five and six years of age,

[1] Plate XXXVII., S.

and small of stature; her face was polished and moderately full, of a dirty hue, and roughened by ragged edges of broken and exfoliating epidermis. The skin of the rest of the body was dry and wrinkled, and around the joints was thrown into folds, looking as if much too large for the body which it contained, or like the parched and shrivelled integument of a person of extreme age and decrepitude. The general tone of color of the skin was a yellowish gray, but the hands were red; gentle pressure with the finger dispersed the redness to a considerable distance around the compressed spot, rendering it perfectly white, and the color was slow in its return. The skin of the backs of the hands and fingers was thicker than natural, hard, like parchment, and divided by deep grooves into large and irregular compartments; this was especially the case upon the knuckles, and every here and there the skin had broken in the lines of motion, and formed deep chaps. The skin of the palms of the hands exhibited the thickening of the derma, the parchment-like yielding of the unpliant tegument, the large compartments, and the deep grooves, more strongly than that of the back, and there were besides deeper fissures and cracks. At the metacarpo-phalangeal joints the fissures were so deep as to sever the integument completely. There was another singular peculiarity apparent in the hands, namely, a want of proportion in length between the skin and the bones, so that the knuckles of the metacarpo-phalangeal articulation made their projection very near the middle of the hand, as though the metacarpal bones had not grown in accord with the integument, or as though the fingers in their growth had carried with them the integument of the body of the hand. This appearance may be imitated by drawing a glove forward on the fingers, and then closing the hand.

The lower limbs were highly characteristic of the disease. The skin of the knees was thrown into numerous prominent wrinkles, on which the epidermis was harsh, dry, thick, and discolored, and in certain parts, where the wrinkles were crossed by transverse clefts, resembled ichthyosis cornea. On the sides of the knee, near the ham, a similar structure existed. From the knee to the ankle the skin was smooth, grayish, silvery, and glossy, *ichthyosis nitida*, and in an oblique light might from its refractive qualities, bear comparison with mother-of pearl (ichthyose nacrée, Alibert). It was marked by a reticulated tracery of white lines, *ichthyosis reticulata*, the lines being occasioned by the loosening and rupture of the epidermis at the abnormal grooves of motion of the condensed skin. The spaces between the reticulations, from their regularity of shape and smooth polish, resembled more or less closely the silvery scales of certain fish; hence the name of the disease; and occasionally, when the reticulations were of small size and irregular, and the centre of each scale thicker and more deeply colored than its border, the idea of the scales of serpents was suggested, *ichthyosis serpentina*. Around the ankle the skin was thrown into prominent wrinkles, and across the instep were three grayish bands, where the epidermis was thicker than natural, and marked by a number of longitudinal clefts into broken ridges running parallel with the foot. On the rest of the back of the foot the skin formed

numerous wrinkles corresponding with the movements of the joints, and along its borders were several deep chaps. The soles of the feet exhibited the same peculiarity as the hands, namely, a disproportion in growth between the skin and the bones. This was apparent in the great length of the foot and the shortness of the toes. The epidermis of the under surface of the foot was very thick, yellowish in color, very much broken, and presented a number of irregular edges; on the borders of this surface were several deep and long chaps.

In adults, the apparently normal state of the face, the dry, wrinkled and mealy state of the skin of the limbs, and the absence of subcutaneous fat, are quite remarkable. Sometimes, however, the face has a peculiar coppery redness and an oily polish, which contrasts all the more with the earthy, dried, and mealy or scaly epidermis of the rest of the surface. The skin of the hand is also remarkable for its coarseness, and the hand of the ploughman is met with in the man of refinement, to whom manual labor is unknown. In ladies, also, the dry, leathery, wrinkled skin of the hands is very striking. I recollect well the shudder that passed over me when I saw this disease for the first time. It was in a gentleman of twenty-five or thirty; in appearance, in freshness of face, and roundness of feature, one would have believed him perfect in every point. He took off his coat suddenly, and drawing up the shirt sleeve, exhibited the withered limb of sordid age; dry, scaly, polished here, mealy and rough there, while a cloud of small micaceous scales flew into the air.

Another character in connection with this disease is interesting in a physiological point of view. From the absence of all secretion, or at least great deficiency of secretion, from the skin, the circulating system loses a natural source of relief when in a state of excitement. Hence active movement is attended with increased rapidity of respiration and action of the heart; and one of my patients informed me that after a dance he panted for breath, he had violent palpitation of the heart, and his brain seemed to reel, from want of air, and from a feeling of suffocation.

The *diagnosis*, the prognosis, and the cause of xeroderma ichthyoides, may be very briefly stated. The general dryness of the whole of the skin is entirely distinct from lepra, which is never general, and always leaves a greater or less extent of sound skin between its patches. From psoriasis, xeroderma is distinguished by the absence of erythema and all signs of inflammation; although erythema may, as a matter of course, be superadded to this disease as an accidental complication; but there is a wide distinction between a congenital defect of nutrition of the skin and a disease subsequently acquired. The *prognosis* of xeroderma ichthyoides is favorable; much may be done by treatment, even if the skin cannot be restored entirely to the state of that of a person who has never been so afflicted; and I can point to several cases in proof. The *cause* of the affection is congenital mal-nutrition, sometimes probably the result of mal-assimilation, commencing soon after birth.

TREATMENT.—The treatment of xeroderma ichthyoides is twofold, constitutional and local. After the general functions of the body

have been regulated by the usual means, the patient should be put under a course of cod-liver oil and arsenic; I have usually selected for the purpose the arseniate of soda, or Fowler's solution; but in some instances have derived advantage by changing those remedies occasionally for Donovan's solution. *Locally*, the treatment should consist of frictions with fresh and sweet neat's-foot oil; the inunction and friction should be made night and morning, and continued for as long a time as the patience or leisure of the individual will permit. For children I prescribe a friction of half an hour or an hour's duration. When the skin is softened and made pliable by the oil, the force of the friction may be increased by the use of the Indian flesh-glove or kheesah,[1] instead of the hand. A tepid soap-bath may be taken once or twice a week, and a cold shower-bath, or sponging-bath every morning on first rising, the bath being preceded and followed by the frictions. Sometimes, particularly in children, and in adults where there arose a difficulty as to the full extent of the friction and inunction being employed, I have found it necessary to increase the stimulant effects of the local application, by the addition of liquor ammoniæ or croton oil, to the oil or ointment employed for that purpose. I may illustrate this method of treatment by reference to the case of a little boy whom I treated in 1844, and who has since continued perfectly well; but I must at the same time remark, that the rapid cure in this case is to be ascribed in some measure to the disease being taken at an early period of its existence, as well as to the correctness of the principle of management.

When I saw him for the first time, I ordered him a soap ablution every night, and an ointment to be well rubbed into the skin after the bath, and in the morning, as follows:

R.—Olei olivæ optatæ, ℥iv.
Ceræ albidæ, ʒij.
Liquefac simul dein adde—
Mellis, ʒij.
Olei Crotonis Tiglii, ♏xx.—M.

I also prescribed for him a teaspoonful of sulphur sublimatum, with ten grains of supertartrate and five of nitrate of potash, twice a week. At the end of a month I increased the croton oil to thirty minims; and at the end of a second month, to forty minims. By the conclusion of the third month the skin had almost regained the pliancy and softness of health; the epidermis ceased to crack and

[1] The kheesah, or Indian flesh-glove, comes recommended to us by the experience of ages, and certainly offers advantages superior to any other kind of rubber for the skin in existence. It is the glove, or rather mitten, which has been used from time immemorial in Hindoostan, Persia, and throughout the East, and by a race of people, both from necessity and luxury, more attentive to the skin than any other upon the face of the globe. The glove was introduced into England by Sir Ranald Martin, of Grosvenor Street, and Messrs. Savory and Moore have succeeded in procuring the manufacture of a similar glove in London. Their imitation is perfect, both in appearance and properties; indeed is superior to the original; and it is satisfactory to me to be enabled to recommend so admirable a contrivance for promoting the health of the body through the agency of the skin. The glove is made of goat-hair, the material used in the manufacture of the Burruck or Persian glove cloth, of which the Oriental kheesah is composed.

break up into dry scales, and the skin was so sound that I was enabled to dismiss him, enjoining a continuance of the soap ablution once a week, with cold sponging every morning, and the daily use of the kheesah. The ointment was now laid aside, as being no longer necessary.

III. ALTERATION OF SECRETION.

In addition to simple increase in quantity, it not unfrequently happens that the secretion of the sebiparous glands is altered in its quality. For example, it may be changed in color, and by its accumulation on the skin form a thin film of a yellow or black hue; or it may be altered in consistence, and after being spread out upon the surface, dry into a hardened crust, which may break up into fragments corresponding with the linear markings of the skin, the fragments maintaining their adhesion to the epidermis, and increasing in size by subsequent deposition. These states of the sebaceous secretion constitute a small group of cutaneous disorders, which we will consider under the names of—

Stearrhœa flavescens,
Stearrhœa nigricans,
Ichthyosis sebacea.

STEARRHŒA FLAVESCENS.

In this disorder the abnormal secretion is of a golden or dirty yellow color and forms a film on the surface, which gives the skin a coarse and disagreeable appearance. The substance is soft, and may be removed more or less easily from the epidermis; sometimes it can be wiped away with the handkerchief, but at other times adheres very tenaciously. When removed, it is produced again in the course of twelve hours, and in twenty-four hours regains its original thickness. The seat of this affection in the cases which have come under my observation, is, the nose, cheeks, and scalp. The subjects of the disorder on the face were ladies; while the affection of the scalp, though more common in women than in men, I have seen in both.

Stearrhœa flavescens sometimes assumes a chronic character, and the abnormal secretion, instead of being soft and removable by ablution, forms a hard and dense crust, which adheres firmly to the skin, and can only be separated by means of the water-dressing. The skin becomes secondarily diseased in consequence of the irritation caused by this crust, and the affection puts on a troublesome character. A case of this kind, at present under my care, has existed for six years, and was originally excited by exposure to the heat of the sun.

STEARRHŒA NIGRICANS.

The abnormal sebaceous substance poured out upon the skin has occasionally a grayish appearance; and in some instances is perfectly black. In other respects, namely, as relates to consistence and

thickness, it resembled the deposits which are formed in stearrhœa flavescens.

Examined with the microscope, I found this deposit to correspond with ordinary sebaceous substance, but the nuclei of the cells, instead of being colorless, were black, and every here and there formed masses of considerable size. Indeed they were identical in point of structure with the deepest colored cells of the rete mucosum of the negro skin; the nuclei being composed of an aggregation of granules more or less shaded with pigment. These appearances correspond with what I had previously observed in some black matter removed from the skin of the face by Mr. Gregory Forbes, in a young lady who was under the care of Dr. MacIntyre.

Fig. P.

In Dr. MacIntyre's case, the abnormal secretion could be removed by washing, leaving the skin beneath perfectly natural, and was reproduced in the course of twelve hours. In another case of this kind, which occurred to Mr. Teevan, and of which an account, with a drawing of the appearance of the patient, is published in the twenty-eighth volume of the *Medico-Chirurgical Transactions*, the skin was so sensitive, that the young lady was induced to abstain from any attempt at washing away the secretion; and each fresh effusion was preceded by a pricking and burning heat. The most remarkable features in the case of Mr. Teevan's patient are the suddenness with which the effusion took place after the skin was perfectly cleared, and the occurrence of black vomitings, black dejections from the bowels, and a black pigment in the urine, when the secretion on the face was arrested. The young lady who was the subject of this unpleasant affection had been under the care of Dr. Read, of Belfast, for a severe pain in her side. At that time the cutaneous affection had not attracted much attention, and Dr. Read was of opinion "that it was connected with imperfect menstrual function."

In an analysis of the black secretion from this patient, made by Dr. G. O. Rees, it was found to be composed of carbon, iron, lime, albuminous matter, fatty matter, and chloride and phosphate of soda.

In a case at present under my treatment, the blackness is confined to the eyelids and adjacent sides of the nose, giving to the young lady who is the subject of this annoying affection, the appearance of having extensive ecchymoses of the eyelids (Plate XX., fig. 1). When the discoloration is coming on, she has a sensation of fulness about the eyes, with slight indistinctness of vision and a little headache. The discoloration is usually greatest in the evening, and is subject to increase with anxiety or fatigue. When wiped with a cambric handkerchief, the handkerchief is soiled.

It is more than probable that some of the cases of black perspiration recorded by the older writers were of the same nature as the cases quoted above. The following instance of a similar disorder is published in the *Philosophical Transactions*, by Mr. Yonge. "A girl, sixteen years old, a daughter of Mrs. Elizabeth Worth, of Plymouth, about the end of April, 1709, had a few hot pimples rose on her cheeks, which bleeding and a purge or two cured. She continued

very well till about a month afterwards, when her face, so far as is usually covered with a vizard mask, suddenly turned black like that of a negro. This surprising accident much frightened her, especially after some foolish people persuaded her she was bewitched, and never to be cured. By prayers, exorcisms, &c., which they used, in order to relieve the fascination, they increased the passion and terror of mind to a great degree, even to distraction, and then desired my assistance. By the arguments which I used, and some composing anti-hysterical remedies, the violence of her fits became much pacified. I directed a lotion for her face, which took off the discoloration; yet it returned frequently, but with no regularity; sometimes twice or thrice in twenty-four hours, sometimes five or six times. It appears insensibly, without pain, sickness, or any symptoms of its approach, except a little warm flushing just before it appears. It easily comes away, and leaves the skin clear and white, but smuts the cloth that wipes it from the face; it feels unctuous, and seems like grease and soot, or blacking, mixed. It has no taste at all. She never had the menses; is thin, but healthful; the blackness appears nowhere but in the prominent part of her face. There are a thousand eye-witnesses to the truth of this uncommon case. The anomalar blackness of the girl's face is now (November 1) divided into a few dark cloudy specks, which appear but seldom, and nothing so livid as formerly."

ICHTHYOSIS SEBACEA.

Sauriderma. Ichthyosis spuria.

Just as the term ichthyosis vera, or xeroderma ichthyoides, has, in a preceding section, been applied to a state of the skin in which the epidermis is broken up into compartments, or scales, which have been compared to the scales of a fish; so, the term ichthyosis sebacea, or ichthyosis spuria, is now employed to designate the production of scales, or horny masses, consisting of desiccated and altered sebaceous substance, and more or less generally distributed on the skin. In xeroderma ichthyoides the scales are thin, and have a certain brightness and splendor which gives a warrant to their comparison with the scales of a fish; but this is not the case in ichthyosis sebacea. In the latter disease, the scaly masses are thick, more or less convex and prominent, grayish or brownish in color; in a word, more like the scales of the saurian reptile than the fish; hence, a more proper designation for this disease would be *sauriderma*.

SAURIDERMA conveys at once the idea of a state of the skin resembling that of the σαῦρος, lacertus, which is the most correct notion that can be given of the disease by a single word; while it prevents the confusion which must always result from the consideration of two essentially different diseases, one involving the epidermis, the other the secretion of the sebiparous glands, under the same common term, namely, ichthyosis. Xeroderma and sauriderma distinguish two essentially different pathological states of the skin.

Ichthyosis sebacea, or sauriderma, presents two principal varieties, one in which the scales or horny masses are not much raised, and are

either *squamiform* or irregular in shape; and another, in which the horny masses are lengthened considerably, and have the character of *spines*. They may be expressed as follows:

Ichthyosis sebacea squamosa,
Ichthyosis sebacea spinosa.

ICHTHYOSIS SEBACEA SQUAMOSA.

Sauriderma squamosum.

We call that state of the skin ichthyosis sebacea squamosa, or sauriderma squamosum, in which, after the effusion of the abnormal sebaceous substance in the form of a thin layer, the latter dries and hardens, and breaks in the direction of the linear markings of the skin, into small polygonal portions, corresponding in form with the areæ of the compartments bounded by these cutaneous lines. The small polygonal divisions are increased in thickness by the accumulation of fresh sebaceous secretion, they become discolored from exposure to dust and dirt, and they assume a brownish or grayish tint, approaching more or less to dirt-color. In the latter state, the small masses have the appearance of scales, closely adherent to the epidermis, hard and dense in texture, and presenting various degrees of thickness. This affection may occur upon any part of the body, but is most frequent on the face, particularly on the forehead and nose, on the abdomen, and on the flexures of joints; indeed, upon all those regions in which the greatest number of sebiparous glands exist, and which are most protected from the friction of dress. The scales are sometimes cast from time to time, as during the summer season, and give place to others formed by successive concretion; at other times they remain adherent for months, and even for years.

This affection of the sebiparous glands is generally unaccompanied by signs of local inflammation of the skin. There is, in many cases, no redness, and no heat, and when the scales are thrown off, the skin is natural, both in color and texture; in others, the skin is congested and thickened; it is studded with numerous apertures of sebiferous ducts, and frequently painful. By accumulation, the scales obstruct the mouths of the excretory ducts, and the latter become much distended. The disease is rarely accompanied with constitutional symptoms, but in a few cases, when general, some degree of gastro-intestinal irritation may be present.

In one instance of this affection which fell under my observation, I had the opportunity of examining the skin after the death of the patient from visceral disease. In this case, the scales were remarkable for their thickness; after being well washed, they were grayish in color upon the surface, but white beneath, and evidently consisted of concreted sebaceous substance. On removing a portion of the epidermis by maceration, the ducts of the sebiparous glands and hair-follicles were found distended with inspissated white secretion, and had a brilliant appearance, projecting like cones of pearl from the under surface of the membrane. The derma presented a number of small deep pits, corresponding with these dilated ducts. The mouths

of the distended excretory ducts opened upon the surface of the epidermis, some immediately beneath and in the middle of the scales, and others by their borders. In the former situation, they could be seen as small white points through the scale, and still more evidently when the epidermis was separated by maceration.

From the examination of this case, of which a preparation is now before me, and of others which I have subsequently observed, I have been led to the conclusion, that the scales, in this disorder, increase in thickness in two ways: firstly, by addition to the free surface, by means of the secretion poured out in the linear furrows of the skin, and, consequently, between the scales; and secondly, by additions successfully made to the attached surface by the effusion of inspissated secretion beneath them. In the preparation before me, the growth of the scales by both these processes is distinctly evident.

A case of this disorder, disseminated in patches over the surface of the head, neck, and trunk, is recorded by Dr. Jacobovics,[1] under the erroneous appellation of "tubercules bigarrés," a new variety of molluscum. Dr. Jacobovics' case differs from ordinary instances of the disease, in the longer duration of the malady, its disseminated character, the excoriations which resulted from its continuance, and the presence of inflamed tubercles intermingled with the patches. The patient was a tailor, of bilio-sanguine temperament, fifty-six years of age, the nineteenth child of healthy parents. His mother had a slight cutaneous affection on the neck; a brother had furfuraceous desquamations on the face; two sisters had small tubercles on the neck and bend of the elbow; a sister's child had a similar growth. At the age of thirty he was attacked with severe pneumonia, which left him in unsound health for some years. On reaching his thirty-seventh year, the cutaneous disorder first made its appearance; it commenced on the neck in the form of small yellowish spots, beneath which one or more white points, the apertures of sebiferous ducts loaded with secretion, were perceptible. These yellow spots gave rise to pruritus, during the summer season, which subsided in the winter. Three years afterwards, on the occasion of a severe mental affliction, the disease showed a disposition to increase, and quickly spread over his neck, breast, and back. The disorder now assumed the appearance of little crusts,[2] having a roundish or irregu-

[1] Du Molluscum, recherches critiques, &c., suivies de la description détaillée d'une nouvelle variété. Par M. M. Jacobovics. Paris, 1840.

[2] With no better reason, apparently, than that of adhering to the erroneous appellation which he had assigned to this disease, Dr. Jacobovics styles the crusts, *tubercles, or tumors*, throughout his essay. They were unquestionably extravascular formations, and mere dèpositions on the surface. In accordance with this view, I have, in every instance, altered the terms tubercle, or tumor, to *crust*. Besides, it does not accord with correct notions of pathology to admit the possibility of a tubercle, or tumor, being converted by progressive development into a crust. But to agree with Dr. Jacobovics, such a doctrine must be embraced; for, after indicating a number of progressive stages of growth completed by the crust, he remarks, in conclusion, "Les tubercules bleuâtres et noirâtres, les *croûtes* noires et verdâtres, et les taches qui leur succedent sont des formes secondaires." That is to say, that the black and greenish crusts are the secondary forms of "les tubercules brunâtres." Those who would peruse the statements of Dr. Jacobovics, I must refer to his essay presented to the "Académie Royale"

lar figure, and various color; for instance, some were yellowish-white; others fawn-colored and brownish; others blackish and livid, and covered with slight desquamation; but there was no constitutional disturbance, nothing to induce the patient to apply for medical assistance until the year 1833, when, annoyed by the violent pruritus and unsightly appearance of the disease, he presented himself at Saint Louis. He was treated at this hospital for two months without benefit, and then returned to his business. Three months later his case was undertaken by Dr. Jacobovics, and presented the following characters:

His hair was remarkable for its greasiness, as were several other parts of his body, particularly the skin of the front of the neck, which the author describes as feeling viscous and unusually soft. At the roots of the hair were numerous yellowish patches and scales of sebaceous substance; these greasy scales were also met with dispersed over many parts of the skin. On the forehead, the alæ nasi, the cheeks, the back, and in several other situations, the apertures of the sebiferous ducts were very perceptible, and many of them were obstructed by inspissated secretion, which was dark-colored in some, yellowish in others, and rose above the level of the surrounding skin in several. In other situations the sebaceous substance retained its softness and whiteness, and, distending the excretory ducts, appeared like white points in the midst of the yellowish and discolored laminæ by which its escape was prevented. The crusts commence by a whitish-yellow or brownish spot, of the diameter of a millet seed or lentil, but without prominence, and pass through a succession of stages which the reporter has accurately detailed. The yellow spot is attended with pruritus, and, examined with a lens, a minute white point may be discerned in the centre of each. In a more advanced stage, the yellow spot has increased in diameter, and is raised in the centre, when it presents three or four white points in place of one. By degrees the yellow spots become transformed into brownish crusts, having a maximum elevation from the surface of two lines, and a maximum diameter of six lines. These brownish crusts appear studded beneath the surface with white sebaceous points, which give the mottled (bizarré) character to the production, which suggested to Dr. Jacobovics the specific name which he has given the disease. The succeeding stages which the author has observed the sebaceous concretions to assume, are, bluish crusts, punctated with white, and having a lobulated appearance, occasioned by the linear markings of the skin; and blackish crusts, punctated only around

[1] Dr. Jacobovics speaks of patches of a dirty yellow, or yellowish-white color; these patches he seems to regard as discolored epidermis, and he describes the white points as being beneath the epidermis. From the observation of cases of this kind, and particularly of the one recorded above, I feel convinced that the yellow patch is a thin layer of inspissated sebaceous substance adhering very closely to the epidermis; this I conceive to be gradually raised by the deposit of fresh sebaceous matter beneath it, until the elevated crusts are formed, which are the distinguishing feature of this case. The white points will, consequently, be seen beneath the sebaceous scale. I have already alluded to this appearance, and have before me a preparation in which it is well shown.

the edges, and intersected by deeper furrows, corresponding with the dermal lines. These latter were chiefly met with in the dorsal region; after a time, the linear furrows increase in depth, even to the splitting of the crust into a number of small polygonal masses,[1] which adhere firmly to the epidermis, and assume a deep black color. The desiccated patches, rubbed by the dress, or scratched with the nails, are liable to excite suppuration of the derma, and the pus, oozing from between the fractured masses, forms upon the surface a succession of irregular crusts, which resemble those of impetigo. Other crusts, of a yellowish-green color, are also met with, resulting from the immediate desiccation of the brownish punctated patches, and these also become broken in the direction of the natural furrows of the derma.

Besides the sebaceous crusts above described, there were interspersed on this man's skin a number of small tumors and tubercles. Some of these were round or oval, prominent in the centre, of a bright red color, smooth and shining, covered by a thin and desquamating epidermis, and the seat of a troublesome pruritus. Others were of a bluish-gray color, with raised and livid borders. These were the principal cause of a violent itching, and indulgence in scratching gave rise to excoriation and chapping of the edges, with a discharge of seropurulent fluid. A third variety were vividly red, indolent, and of small size, varying from that of the head of a pin to that of a small lentil. But these tumors bore no proportion to the sebaceous crusts. They were probably the consequence of irritation caused by the sebaceous concretions, and can only be regarded as a complication of the sebaceous disease.

As regards diagnosis, Dr. Jacobovics, after recapitulating the physical characters of the preceding case, *e.g.*, hereditary tubercles, varying in size from that of a lentil to that of a pigeon's egg (there were none so large in his case), round or irregular, usually sessile, brownish color, consistent or softish, generally solid, no constitutional disturbance, &c., remarks, "Among the tuberculous diseases of the skin, none but the present genus is capable of assuming the whole of these characters, so I am bound to establish this in the genus molluscum." An unfortunate preference for molluscum is already synonymous with heterogeneum. In the treatment of this case the author employed purgatives and warm baths, but with only partial success.

I have lately met with a case in which the abdomen of a boy, particularly its lower half, was in the state of sauriderma squamosum. The surface was covered with small, brownish, gray, convex squamæ, of nearly uniform size and thickness. The scales were so regular in their arrangement as to give the idea of a normal rather than a morbid structure, and resembled very closely the scaly skin of some of the saurian reptiles. In other respects the skin was dry and harsh to the touch. When the squamæ or crusts form upon the face, they occur, for the most part, in clusters, upon small patches of dry and congested skin; sometimes they are met with on the sides of the nose, some-

[1] The masses are identical with those described at the commencement of this section.

times on the cheeks, and sometimes on the temples and forehead. In these latter situations, they are not uncommon in elderly persons, and are apt to give rise to alarm, from the supposition of their being of a cancerous nature. The latter notion is suggested from their being occasionally met with surmounting small patches of indurated skin. When displaced from these patches of altered skin, the latter is apt to bleed, and not unfrequently a superficial abrasion of small size is found beneath the crusts.

ICHTHYOSIS SEBACEA SPINOSA.

Sauriderma spinosum. Porcupine disease.

The spinous variety of ichthyosis is characterized by the formation of hardened masses of altered sebaceous substance, which acquire by growth the form, thickness, and length of short spines. This disease may be developed upon any part of the body, or upon the entire skin, with the exception of the palms of the hands and soles of the feet; the spots of election in the partial kind being the thick skin of the outer sides of the limbs, the convexities of joints, more particularly the elbows, wrists, and knees, and the dorsal surface of the trunk. Ichthyosis spinosa is for the most part congenital; it is associated with a dry skin, in which the perspiratory function is deficient; it is unaccompanied by redness, heat, or local uneasiness, and it endures for a lengthened period, often for the lifetime of the patient. In the earlier periods of the disease the integument is unaffected, retaining its natural softness and pliability; at a later period, it becomes thickened and hard from infiltration and deposition, and the morbid action appears to extend deeply into the subjacent tissues. The spines are dense and hard, and for the most part of a dirty brown, or greenish brown color.

The form and length of the spines in this disease are determined by certain laws, the former depending upon the shape of the small areæ of the epidermis marked out by the furrows of the skin; the latter upon the powers of the system, and consequent energy of secretion. In illustration of this view, it will be remarked that, of the spines produced upon the convexities of the elbows and knees, where the dermal areæ are large and somewhat quadrilateral, the section has a similar form; while, on the anterior aspect of the forearms, particularly near the joints, where the areæ are narrow and elliptical, the spines are transversely flattened and slender. With regard to length, I have never seen any of the spines longer than a quarter of an inch; but Willan records instances in which they attained a full inch in some places. They stand out perpendicularly to the surface of the skin, their sides are polygonal, and when the limb is in its natural position, they fit closely side by side, so as to present, by their free extremities, an even and continuous surface. The free ends of the spines are more or less rounded and polished by attrition with the dress of the patient, and the sharp angles of their shafts are rounded off by friction against adjoining spines caused by the movements of the limbs. The base generally corresponds with the small area of

skin upon which it is implanted, and to which it is firmly adherent; but by degrees, as the activity of the secreting function subsides, the base becomes reduced to a slender pedicle, and is easily broken off.

Examined with the microscope (Plate VI., fig. 5), the spines of ichthyosis are found to possess all the general features which might be expected *à priori* to be present in small cylinders of desiccated sebaceous substance; they are sub-fibrous, and obscurely laminated; the surface is more or less notched and jagged, the apex somewhat split, and the base frequently connected with a broad lamina of exfoliated epidermis. Their internal structure is still more characteristic; they generally contain, imbedded in their substance, several minute hairs, sometimes running in a serpentine manner through their entire length, but more frequently coiled and twisted, and evidently fixed in that position previously to their excretion by the sebiferous ducts. These observations lead to the inference, which I believe to be true, that the spines of ichthyosis are frequently, if not generally, formed upon the short hairs of the body as they issue from the skin; the hairs being naturally, and as a consequence, very much interfered with in their growth.

Fig. Q.

A spine from a "porcupine boy." The spine is magnified 19 times. It contains in its structure a group of downy hairs, which form convoluted bunches here and there.

This disease is not usually accompanied with constitutional symptoms; the persons affected appearing to enjoy a moderate state of health. Sometimes irritation of the mucous membranes is coincident with the cutaneous affection; and Willan has observed, that inflammatory pustules or boils occasionally appear on some part of the skin. The epidermis of the palms of the hands and soles of the feet is dry and harsh, and there is frequent scaliness of the face.

Willan has pointed out two appearances which the local forms of this disease sometimes present, and distinguished them by the name of ichthyosis cornea. In one of these the spines are curved or twisted, and unusually long, and suggest the idea of miniature ram's horns. In the other the spine is broad and single, and constitutes a hornlike mass. These peculiarities are rare, and no purpose is gained by their separation from the typical disorder.

Diagnosis.—Cazenave and Schedel, who refer to Biett's description of this affection, state that, when it has appeared upon the nose, it has been mistaken for noli me tangere. This error I have seen committed; but it is not one likely to be fallen into by those who examine the scale-like masses with attention. The presence of dense scales or spines, and the irregularity of position and form sufficiently distinguish ichthyosis sebacea from every other disease of the skin.

Causes.—This affection occurs at all ages, especially in persons of phlegmatic temperament, in whom the skin is thin and delicate. It is sometimes accompanied by an unctuous state of the integument,

but more frequently by a dry and parched condition of the epidermis, and shrivelled appearance of the skin. Occasionally it has been seen after parturition. The most frequent cause I believe to be torpor of the skin and absence of proper excitation by ablution and friction.

Ichthyosis spinosa is for the most part hereditary, appearing in the male branches of a family only, as in the instance of the Lamberts, but often originating without any similar disease having been known to exist in the family of the diseased person. In rare instances it appears a few days after birth, but more frequently shows itself for the first time at the end of two or three months. Rayer alludes to a fœtal monster preserved in the Anatomical Museum of Berlin, the whole surface of whose body is covered by a layer several lines in thickness, which, being broken up into small pieces, gives it the appearance of a coat of mail. When the disease occurs after puberty, or in the adult, it would appear to be dependent on local and endemic causes. Among these have been enumerated, the ingestion of bad fish, bad water, humidity of atmosphere, &c. Buffon states the disease to be endemic in Paraguay; and several places on the sea-coast have, equally incorrectly, obtained a similar reputation.

TREATMENT.—The first indication presented to the mind, in considering the nature of ichthyosis sebacea squamosa with reference to treatment, is to remove the scaly concretion; and the second to excite the sebiparous glands to healthy action. The former object is to be effected by means of the warm bath, or warm alkaline fomentation, or by water-dressing. The second may be attained by frequent ablutions with warm or cold water, succeeded by brisk frictions with a rough towel; sea-bathing, and astringent lotions. The bichloride of mercury in emulsion of bitter almonds is a useful application in this affection; so also is the lapis divinus, in the form of lotion or ointment. During the progress of the local treatment, it will be desirable to administer some laxative medicine, and to regulate the diet of the patient.

In ichthyosis sebacea spinosa the spines are to be softened by warm alkaline ablutions or baths, or water-dressing, and then some stimulating application made to the skin; such as a lotion containing a drachm of tincture of croton to the half-pint, or a liniment containing a small quantity of liquor ammoniæ. Constitutional remedies, such as the symptoms may indicate, are to be used internally, as alteratives and tonics; and Fowler's and Donovan's solution will be found valuable as determining an increased action and improved condition of the skin. The liquor potassæ, with decoction of sarsaparilla, may also be tried with expectation of relief. Willan, Bateman, and Elliotson have recommended pitch, in doses of an ounce daily.

IV. RETENTION OF SECRETION.

The present group of diseases of the sebiparous glands is characterized by distension of their ducts and related hair-follicles, with more or less alteration in the quality of the secretion, the alteration tending chiefly to inspissation. This group admits of division into

two sub-groups or families, in one of which the excretory hair-follicle still remains open, the secretion is inspissated, and in communication with the exterior. In the second family the excretory hair-follicle is closed at its aperture, and the escape of the secretion prevented.

(A.) *Retention of secretion in the sebiferous ducts, the excretory aperture remaining open.*

COMEDONES.

Syn. *Grubs. Worms. Mitesser*, Germ.

The simplest form of this disease is that which is popularly known under the name of *worms* or *grubs*. In this affection, the sebaceous secretion is inspissated, and produces complete distension of the related hair-follicle. Reaching the mouth of the latter, the secretion hardens, and becomes deeper in color; and at the same time, from being exposed to the dust and dirt of the atmosphere, the extremity is rendered dingy and dark-colored. This discoloration of the sebaceous substance at its extremity gives rise to the appearance of a round black spot, with which, in some persons, the skin of the face, particularly of the nose, is more or less thickly studded. If a fold of skin, including one of these spots, be pressed between the fingers, the concreted secretion is squeezed out, under the form of a little white cylinder, about a line in length, and blackened at its extremity. It is the lengthened form of this little cylinder, with its dark extremity, that has gained for it its popular designation.

Instead of being soft and easily pressed out from the hair-follicle, it sometimes happens, where the secretion has remained undisturbed for some time, that the little cylinder has become desiccated, and resembles horn, both in appearance and density. In this case the concretion requires to be dislodged by a pointed instrument, or withdrawn by means of a pair of ciliary forceps. In an instance of the kind now before me, there are several patches of skin, of about the size of a crown-piece, on different parts of the body, closely studded with these horny comedones, every hair-follicle in the affected area being occupied by its little spine, slightly projecting beyond the plane of the surrounding skin.

The disorder of the sebaceous glands here described is commonly met with on the face of persons in whom the cutaneous circulation is less active than natural, and particularly among the inhabitants of cities and large towns, in whom the brain and nervous system claim an undue proportion of the vital energies; and in whom congestions of the viscera are not unfrequent. It is generally associated with the presence of other diseases of the sebiparous glands, and is always met with in combination with acne. Indeed, one form of acne, acne punctata, is simply an inflammation of the sebiparous gland and related hair-follicle, excited by the overload of inspissated secretion.

When the substance expressed from one of these comedones is examined with the microscope, the sebaceous mass is found to be altered in its composition. Instead of flattened epidermal cells or

scales, intermingled with myriads of oil-globules, which compose the normal secretion, the inspissated substance consists of cells containing a granular substance, and a variable number of oil-globules. Besides these cells, several minute hairs are seen in the centre of the mass; they are usually twisted, or bent, and sometimes to such an extent that the tapering point is approximated to the root. Occasionally I have observed the epidermal follicle still surrounding one of the hairs, and more frequently so when one only exists in the sebaceous mass. In this case the bulb of the hair is perfect; its fibrous brush-like root, and the granular mass of the pulp, are distinctly apparent. More frequently, the hairs are broken at their larger ends, and the fibrous structure of the hair is evident. The number of hairs seen in the mass of a comedo appears to have relation to the period of impaction of the sebaceous substance; for when the matter is soft, and of recent collection, I have found only one hair, or at most two, one of the two being surrounded by its epidermal follicle; but when the mass has been impacted for some time, I have counted upwards of twenty. (Plate III., fig. 18.) Dr. Gustav Simon remarks, that he has seen as many as forty in some comedones.[1]

This observation is an illustration of the physiology of the invisible downy hairs of the body, and serves to prove that which, *à priori*, we should be led to infer, and indeed that which their presence in the ceruminous substance of the meatus auditorius in such numbers also testifies, namely, that they are continually thrown off, after attaining a certain length, and continually reproduced. In the instance before us, the pathology of the comedones, the sebaceous secretion is poured as usual into the hair-follicle, but instead of being excreted from thence, and diffused upon the skin, collects, probably as a consequence of its altered nature, and obstructs the follicle. The little hair, when thrown off by the usual process, is no longer conveyed away from the follicle with the sebaceous secretion, but is surrounded by the latter in its altered state, and remains enveloped in its substance. By a continuance of this process, a number of hairs may thus be amassed.

Dr. Gustav Simon has recently discovered, in the sebaceous substance of comedones, and in that which is squeezed out from the cones of acne punctata, certain microscopic animalcules, supposed, by the entomologists of Berlin, to be related to the genus acarus; hence, Dr. Simon terms the animalcule *acarus folliculorum*. A description of this animalcule will be found in a separate chapter, at the conclusion of the volume.

Treatment.—The treatment of comedones requires the employment of such means as are calculated to stimulate the skin gently, and excite it to the due performance of its proper functions. The parts affected should be saturated with soap, and thoroughly washed; they should then be rubbed briskly with a rough towel, until the skin be felt to glow; and this should be repeated twice in the day. The immediate effect of this treatment may possibly be a red and patchy state of the skin, which will speedily pass away. It would be well in

[1] Muller's Archiv., No. 2, 1842.

these cases to extend the ablutions and frictions to the entire body, for the appearance of the disease in one part is indicative of a generally torpid action of the skin. Cold bathing and sea-bathing are also calculated to be beneficial. In some instances it may be necessary to employ some medicinal stimulant, in which case the bichloride of mercury lotion with spirits of wine, or with the emulsion of bitter almonds, will be found to be the best application.

ACCUMULATIONES SEBACEÆ.

MOLLUSCUM SIMPLEX.

Syn. *Small sebiparous tumors*, Wilson. *Molluscum contagiosum*, Bateman. *Molluscum sessile; subglobulosum; parvum; pisiforme.*

In a second group the secretion is not confined to the excretory duct, but distends also the primary ramifications of that duct, so as to give rise to a small tumor, about equal in size, in its fully developed state, to a ripe currant. (Plate VI., figs. 6, 7, 8.) This resemblance is not confined to size alone, for the sebaceous substance, rising to the aperture of the follicle in the centre of the tumor, appears like the depression on the summit of the currant to which the corolla is attached, while the sebiferous ducts swell out in the circumference of the tumor, and give it a slightly lobulated appearance. When a transverse section of this little tumor is made, it is found to be divided into five or six segments, each of the segments containing a dilated branch of the excretory duct. The swelling of these segments, moreover, gives rise to a depression on the summit of the tumor, corresponding with the aperture of the duct, from which a portion of the concreted sebaceous substance can always be removed by means of a pointed instrument, and it also produces a constriction around the base of the tumor.

When these little tumors are left to themselves, they terminate, according to my observation, in one of two ways: either by ulceration of the summit, and discharge of the sebaceous substance and gland *en masse*, for the gland is but loosely connected with the integument; or by inflammation and sloughing of the entire tumor. In the former case, the collapsed integument, when the base of the tumor has become much constricted, forms a small, pendulous, pyriform appendage, *verruca acrochordon*, which remains for the rest of life. In the latter, the ulceration sometimes extends deeply into the skin, and leaves behind permanent and unsightly cicatrices.

An instance of this disease lately (March, 1842) presented itself to my notice, which was remarkable for the active development of the tumors. They were first perceived, about fifteen or twenty in number, dispersed upon the skin of the neck, face, and shoulders of a little girl, four years of age. By the advice of the family medical attendant, she was sent into the country, and in the course of a few weeks became quite well, all the tumors having disappeared, and no new ones being formed. Soon after her return to town, the mother brought to me her two other children, an infant and a girl of six years old. The

mother and children were of fair complexion, with light hair, and thin delicate skin; the mother was alarmed at the development of these little tumors on her two other children as well as on herself, "caught," as she imagined, from the child first affected. I quieted her alarms relative to contagion, but was much struck by the fact of the almost simultaneous appearance of the disease upon four members of the same family. On the neck of the mother I found four or five of these little tumors closely resembling and of the size of currants, constricted at their base, and each presenting an umbilicated depression of impacted sebaceous substance, the aperture of the excretory follicle; and she directed my attention to three ugly scars upon the face left by similar tumors recently healed. On the neck, face, and shoulder of the eldest child I found eight or ten little tumors, presenting all their stages of growth. One upon the shoulder was so completely pedunculated, that I was tempted to place a ligature around it, and in a few days it fell off. On the infant they were less advanced, they were just rising from the integument, and each possessed in its centre the dark point of an excretory sebiferous follicle. The little tumors presented no signs of inflammation, they were of the natural hue, or somewhat lighter than the surrounding skin, from the whiteness of the secretion which they contained, and there was no areolar redness round their base.[1]

Since the above account was written I have again (August, 1842) been visited by this patient, on account of the development of a small angry tumor of a similar kind on the margin of the upper eyelid of her little girl, involving two or three of the Meibomian glands. With this exception the children have remained free from any return of the tumors. On inquiry as to the manner in which they disappeared, the mother tells me that they became black, and shortly after were rubbed off accidentally. One of large size, and situated behind the ear, in the child first affected, was snipped off by Mr. Tyrrell. The mother, who is out of health, has three still remaining, one of small size near the angle of the right eye, and two upon the back of the hand.

Upon examining these little tumors I found them to present all the characters of a small conglomerate gland,[2] consisting of several lobules held together by cellular tissue, and the lobules composed of ramified ducts and terminal sacculi. The ducts were remarkably dilated, particularly the central one, and were filled with inspissated secretion. The latter was identical in composition with the concreted sebaceous substance of the comedones. The cells were of the same size, had the same appearance, and were intermingled in considerable number with epidermal scales. I disagree with Dr. Paterson in considering these cells as peculiar organisms, capable of nucleolar propagation when transferred to an appropriate nidus in another individual, and simply regard them as the normal sebaceous cell, which contains a granular substance, filling it more or less completely.

[1] For an illustration of this disease, see "Portraits of Diseases of the Skin," Plate XXXVIII., AF.

[2] This observation confirms the description given by Dr. Henderson.

The difference in the appearance of the cells examined by Dr. Paterson and by myself appears to me to be immediately explained by reference to the physical difference in the contents of the tumors. In Dr. Paterson's case the contents, as in Bateman's, were milky, and consequently semi-fluid; and the conditions were favorable to the production of cells, having a considerable interval filled with fluid between the granulous nucleolar substance and the membrane of the cell, a disposition which induced Dr. Paterson to regard them as being composed of an external vesicle and an internal vesicle, the latter containing the granular substance. But, in my cases, the contained substance was concreted, there was a deficiency of fluid, and the granulous substance filled the cell, and in exceptional cases only were any cells perceived with a peripheral interval. On the second day, when the mass had been steeped in weak spirit for a number of hours, the peripheral interval was evident in a considerable number.

On examining my new stock of sebaceous matter (August, 1842), fresh from the patient, I found it to consist of cells heaped together like a pile of eggs, and intermingled with a large quantity of epidermal scales in flakes. The mass consisted solely of these two substances, without any granular matter or oil-globules. The cells were variable in figure, some being more or less cuboid, others irregular from compression, some oblong like the eggs of the ant, others oval, but the most common form was ovoid, like that delineated in the figures of Dr. Henderson and Dr. Paterson. The cells presented equal diversity in size, varying in their long diameter from $\frac{1}{909}$ to $\frac{1}{667}$ of an inch, and in their short diameter from $\frac{1}{1430}$ to $\frac{1}{1111}$; some of the cuboid cells measured $\frac{1}{1000}$; the general size of the oval form was $\frac{1}{660}$ long, and $\frac{1}{1000}$ broad; there were several oblong cells, measuring $\frac{1}{555}$ by $\frac{1}{1429}$; and the common dimensions of the ovoid cell were $\frac{1}{720}$ by $\frac{1}{1000}$. This size corresponds very closely with the cells of ordinary inspissated sebaceous substance, whether it be concreted or pulpy; and also with the dimensions of the epidermal scales lying scattered among the cells. The contents of the cells were also various; some were filled with granular substance, in the midst of which, at some one point, a nucleus was perceptible; others contained a homogeneous substance, separated into polygonal masses, mostly of a cuboid shape; while others, again, were more or less filled with minute oil-globules. It is difficult to say which kind of cells were most numerous. I saw nothing like the double vesicle described by Dr. Paterson, and I think it possible that the appearance which he has delineated may have been produced either in the manner I have already suggested, or by the superposition of a single cell by several connected scales of epidermis; or again, by the accidental position of the cell upon the epidermal scales in such a manner as to constitute a thin margin around it.

Treatment.—In the case above detailed I prescribed laxative medicine, and touched the tumors with nitrate of silver several times. By this treatment I succeeded very speedily in removing them. I have mentioned that a ligature was placed around one; a more expeditious mode of getting rid of them would be to snip them off with scissors. In adults they may always be snipped off. On the mother

of these children I opened several with a lancet, and touched them inside with nitrate of silver. Their return may be prevented by the plan of stimulation of the skin, recommended for the treatment of comedones. Dr. Thomson used sulphate of copper, and Dr. Paterson potassa fusa, in their treatment. In a case which I lately saw under treatment in the wards of St. Louis, M. Lemery employed nitric acid.

In the mode of cure of these tumors I perceive another argument against their contagious nature. They disappeared in the first child, on the recovery of her health, during a short visit to the country, without local treatment. In the case of the other two children many of the little tumors fell off, and the disease got well under the use of the compound senna powder. The three at present on the skin of the mother are attributable to a disordered state of health. Indeed, the family may be said to be the subject of a *sebaceous constitution*, and any recurrence of disordered health will bring with it a disposition to the formation of sebaceous tumors.

After having determined the nature of the small tumors above described, and having assigned to them the position which they appeared entitled to occupy among diseases of the skin, I read, for the first time, with attention, the cases narrated by Bateman, under the head of Molluscum, and was struck with the identity of Bateman's cases with those I had just witnessed. Pursuing my inquiry with a view to ascertain the true meaning of the term, and that which seemed to be intended in its original application, I came to the conclusion expressed by Dr. Jacobovics,[1] that Bateman must have borrowed the appellation from the essay of Dr. Ludwig,[2] the reporter of the celebrated case which occurred to Tilesius. The author in his preface remarks, "Rheinhardi, visu fœdum, corpus tectum est verrucis *mollibus* sive *molluscis*." Alibert, Biett, Cazenave, and Schedel, on the contrary, attribute the origin of the term to some resemblance existing between the cutaneous tumors and the knots on the bark of the maple.

The earliest case of this affection on record, and the one in fact which, according to the above supposition, gave the designation to the disease, is that of Tilesius, recorded by Ludwig. I propose to make an analysis of this case, as well as of those which have been published on the same subject to the present time, in order to ascertain the opinions entertained by their respective authors of the cases which have appeared in their names. The result of this inquiry will be a confirmation of my opinion respecting the pathology and true position of molluscum.

Case observed by Tilesius.—John Godfrey Reinhardt was born at Muhlberg, of healthy parents, in 1742. At birth, his body was covered with excrescences of small size. When seen by Tilesius in his fiftieth year, these excrescences varied in size from that of a pea to a pigeon's egg. Their form was various, some being like warts, others oval, others irregular, and others flattened, either by the clothes of the

[1] Du Molluscum, recherches critiques, &c. Paris, 1840.

[2] Historia pathologica singularis cutis turpitudinis J. G. Rheinhardi viri 50 annorum, &c. By Dr. C. F. Ludwig. Lipsiæ, 1739.

patient or by pressure against an adjoining part. The most remarkable of these excrescences was one which was developed from the integument over the ensiform cartilage; it was wallet-shaped, tuberculated on the surface, flaccid, and hung as low as the umbilicus. Its tuberculated appearance indicates its constitution of several smaller excrescences. The prevailing color of the tumors is red; here and there one may be seen of a dull yellow or reddish brown hue; they are spongy and soft in texture, and the skin which supports them is dirty-looking and earthy. "*In medio quarundum maximarum excrescentiarum parvum foramen conspicitur, ex quo nigra corpora oblonga, quæ altius in cute albicantem atque tenerum processum habent, exprimi possunt, quæ vulgo* comedones *appellantur.*"

The excrescences are most numerous by the side of the vertebral column, on the thorax, neck, and the sides of the abdomen. On the head, one has the appearance of an encysted tumor. Regularly every month some of the tumors become congested, and itch greatly, forcing the patient to scratch them violently. He is the subject of habitual feverishness, which is increased at each fresh attack of congestion of the tumors, and is accompanied by loss of appetite.

Reinhardt is short of stature, has a large head, knees somewhat incurvated, protuberant abdomen, and dull expression of countenance. His position in life is one of indigence and misery. He has invariably refused to permit the removal or puncture of one of the tumors, so that their internal structure is entirely unknown.

Such is the case observed by Tilesius. The question now comes to be, What is the nature of the disease? Let us review the evidence. An unhealthy child, born with disordered sebiparous glands, the ducts of the glands loaded with inspissated secretion, and forming small prominences on the surface of the skin. The child bred in "indigence and misery;" the skin "dirt-colored, and earthy in appearance;" the child and man unsound in body, sluggish in functions. Here, then, are precisely the conditions which we should desire to bring together for the purpose of inducing the disease artificially. For the most conclusive of all evidence, mark the Latin passage quoted from the original; the excretory aperture in the centre of the largest tumors, the altered sebaceous substance squeezed out, nay more, its comparison with "comedones." One of the tumors situated in the scalp we find to have taken on the usual characters of a sebaceous encysted tumor. The sebaceous tumors in this case are remarkable for being the largest on record. But why? Because they were reared in excellent soil, and because they possessed a growth of half a century. One assumes the form of a wallet, but this we find is the aggregation of several, growing from a limited spot of skin and one richly supplied with sebiparous glands. The wallet is also favored in its growth by the constant irritation produced by the pressure of the shoemaker's last. The constitutional symptoms form no part of the disease, only so far that such an abundance of unhealthy glands would necessarily excite general disturbance, and, aided by "indigence and misery," and by endemic conditions, would conduce to the

development of intermittent fever, under which the patient suffered several times.

One other observation is elicited by this case, namely, that no suspicion of contagion appears to have occurred to the minds of any of the persons named in the narrative. The father and mother of the patient never suffered from a cutaneous complaint; his two brothers were free; his two wives were equally exempt, together with an infant child. But this is the typical case of molluscum, with which all future observations must be compared; this is the case which has supplied dermatologists with their definition of the disease, which enabled Bateman to announce that molluscum "is characterized by the appearance of numerous tubercles, of slow growth and little sensibility, and of various sizes, from that of a vetch to that of a pigeon's egg. These contain an atheromatous matter, and are of various forms; some being sessile, globular, or flattish, and some attached by a neck, and pendulous."

None of the tumors were punctured in Reinhardt's case, but that omission is of little moment, when we again advert to the Latin quotation. The tumors from which no sebaceous substance escaped, upon which no aperture was apparent, were undoubted instances in which the excretory aperture had closed, as in encysted tumors.

Cases observed by Bateman.—This author reports six cases of sebiparous tumors which he considers, in reference to the case of Tilesius, "a singular species of molluscum." In my opinion, the only difference between Bateman's cases and that of Tilesius is one of duration; and the same observation applies to all the cases recorded since his time. The sebaceous tumors of Reinhardt were of fifty years' growth. The assumption of the contagion of these cases appears to me as unfounded as in the four cases I have myself related. It will be remarked, that of Bateman's seven cases, three were children of the same family; two were children, apparently, of another family; and two were servants in the first family—one an undoubted case, the other supposititious. But to proceed:

"The face and neck of this young woman," writes Bateman, "were thickly studded with round, prominent tubercles, of various sizes, from that of a large pin's head to that of a small bean, which were hard, smooth, and shining on their surface, with a slight degree of transparency, and nearly of the color of the skin. The tubercles were all sessile, upon a contracted base, without any peduncle. From the larger ones a small quantity of milk-like fluid issued, on pressure, from a minute aperture, such as might be made by a needle's point, and which only became visible on the exit of the fluid. The progress of their growth was very slow; for the first tubercle had appeared on the chin a twelvemonth ago, and only a few of them had obtained a large size." "She ascribed the origin of this disease to contact with the face of a child, whom she nursed, on which a large tubercle of the some sort existed; and on a subsequent visit she informed me that two other children of the same family were disfigured by similar tubercles; and, besides, that the parents believed that the first child had received the eruption from a servant, on whose face it was observed. Since

my attention was drawn to this species of tubercle, I have seen it in another instance, in an infant brought to me with porrigo larvalis; and, on investigation, it was found that she had apparently received it from an older child, who was in the habit of nursing it. In this case the milky fluid issued from the tubercles, and may be presumed to be the medium of contagion."

Cases observed by Dr. John Thomson and Dr. Carswell.[1]—The first case occurred in the Canongate, in April, 1821, in three children of the same family. The eldest boy was supposed to have brought the disease from school, and to have transmitted it to his brother and sister. "The contagious nature of the disease is well evinced in the child. On the back of its hands a considerable number of tubercles are seen, which have been produced by applying them to the face, and scratching those situated there during their inflammatory stage. Some of the tubercles are small, others large; some in a state of active inflammation, others nearly of the same color as the skin, and quite free from pain. A few of them are pedunculated, but the greater number are attached by broad bases." "The mother, though in the constant habit of nursing the youngest child, has not been infected."

A second series of cases came more recently under Dr. Thomson's attention. A farmer's child was affected with the characteristic little tumors: he had taken the contagion from the child of a farm-servant. Some of the tumors were situated on the eyelids, and gave rise to conjunctivitis. While suffering from this disease, the child rested his face against the neck of a servant girl as she tended him, and she, too, became the subject of sebaceous tumors.

These cases are narrated in the true spirit of contagion, and with an unconditional assent to the opinions of Bateman. I regret that less attention was bestowed in ascertaining the state of the skin and sebiparous system of the patients, their health, and especially their habits of cleanliness.

Case observed by Alibert.—Alibert treats of the molluscum of Bateman, under the name of mycosis fungoides, and he associates the disease with the Amboyna and Molucca pox, with which it bears considerable analogy. His definition is brief, but vague. He observes: "The disease appears upon one or several parts of the body, in the form of fungoid (fongueuses?) and oval-shaped tumors, which arise and are developed successively upon the face, upper and lower extremities. These tumors, which are very analogous in texture with champignons, after having reached their full growth, open like decomposing fruits, and give exit to an ichorous fluid, which is often puriform, and sheds around it a disgusting odor."

The case from which he derives his definition I will shortly narrate. The mother of the patient had upon the face an ulcer that was cured by the application of caustic; his brother died of a cutaneous disease, which resisted all medical treatment. The man, named Lucas, was fifty-six years of age; his disease was ushered in by a furfuraceous eruption, which was soon after succeeded by the development of small

[1] Edinburgh Medical and Surgical Journal, vol. lvi. p. 280. Dr. Paterson's paper.

tubercles, smooth and polished on their exterior, and presenting, for the most part, the ordinary hue of the skin, some few having a brownish tint. They were distributed over nearly all parts of the body. They resembled morelles or agarics in form; some were shaped like an olive; and they increased in number to such an extent that fourteen were removed from the face. Their base was large; they were spongy in texture, and they exuded a reddish fluid, which imparted a greenish or yellowish stain to his linen. This fluid concreted on the tumors into the form of a brownish or grayish crust. The majority of the tumors terminated by bursting, and then falling into a flaccid state, leaving in their place a withered skin, which the daughter of the patient removed with scissors, without exciting pain. After experiencing considerable mental affliction, he had an attack of pemphigus. The tubercular disease increased rapidly after this period; the tubercles, on breaking up, gave rise to ulcers, the patient suffering from lancinating pains in these ulcers; he became emaciated and hectic, and died, after keeping his bed for seven months, and being the subject of this disease for five years.

This case is not satisfactory: the seat of the disease in the sebiparous glands is not proved; indeed, Alibert suggests no opinion with regard to the pathology of the tumors, but contents himself with classifying them with the molluscum of Bateman. Examination after death was unfortunately refused: had that been made, I have no doubt that serious visceral disease would have been discovered. I think it very unlikely that the man died of the cutaneous disease.

Rayer, who had never seen a case of this disease, remarks with regard to it, that its "seat appears to be the sebaceous follicles."

Cases observed by Biett.—Biett, in the *Dictionnaire de Médecine*, referring to the case of Tilesius, remarks, that he had seen two analogous cases, but that in these the tumors were hard and consistent, and contained neither atheromatous matter[1] nor liquid. He also cites the instance of an old man, whose skin was covered with these little tumors, without any disturbance of his health. Biett met with another form, "non-contagious molluscum," in young women after parturition. In these cases the little tumors were flattened, slightly fissured (*fendillées*) at their summit, irregular in form, and brownish or fawn-colored in tint. They were indolent, and more particularly distributed about the neck.

Such is the evidence of the distinguished Biett; but, with all deference to his judgment, I see in these cases no reason for altering my opinion with regard to the pathology of the tumors. Nor can I perceive any difference between the two forms of non-contagious molluscum, which he seems desirous of establishing.

[1] By the term "atheromatous matter" is to be understood sebaceous substance altered to the appearance and consistence of pap. The word "liquid" no doubt relates to the "milky fluid" of Bateman. There was no such fluid in my cases; the sebaceous substance was concreted and dense; not soft, as in the case of Tilesius, nor fluid, as in those of Bateman. Biett's appear to have been similar to mine. Since the publication of my first edition, I have repeatedly seen the milky fluid described by Bateman.

Cases observed by Cazenave and Schedel.—These authors relate that they saw, in the Hospital St. Louis, a patient affected with prurigo, on whose body were a number of little indolent tumors. The largest were scarcely so large as a hazel-nut, others were no larger than a small pea. They appeared formed of a dense fibrous substance, and pressure produced no pain. After describing "molluscum non contagiosum," they continue, "Molluscum contagiosum is a very rare disease, and does not appear as yet (1828) to have been observed in France. It is characterized by tubercles, rounded, prominent, hard, different in size, smooth, transparent, sessile, giving exit by their summit to a white fluid," &c.

Cases observed by Gibert.—This author does not conceive it necessary, in his treatise, to describe molluscum, of which he remarks that he has seen but two or three undoubted cases in the course of fifteen years. One of these occurred in the *service* of M. Biett, in a child ten years of age, afflicted with chronic enlargement of the liver and spleen, the consequence of a fall on the abdomen. The entire skin was sprinkled over with small whitish tumors, of about the size of peas. They were hard, indolent, and not unlike those little cretaceous tumors we occasionally meet with in the substance of the liver. M. Biett considered that the disease should be referred to the genus molluscum of Bateman, a rare affection in our climate, but not unfrequent in India.

Cases observed by Dr. Jacobovics.—In the spring of 1839, this author saw, at St. Louis, two women, one sixty, the other seventy years of age, who were covered with fungiform tubercles. To describe these tubercles would be to repeat the observation of Tilesius. The face, neck, head, and limbs, were closely set with the morbid excrescences; at the base of the right hypochondrium of one patient, and on the neck of the other, one of these tumors was as large as the fist, and shaped like a wallet. The tubercles were red in color, and the greater part poured out a small quantity of ill-smelling sero-purulent fluid, which every here and there concreted into thin crusts. No other member of the families of these two women had suffered from a similar disease, and on one the eruption had existed for two years. These cases were not further observed.

In his essay on molluscum, Dr. Jacobovics attempts the classification of all the known diseases possessing the general characters of those of Tilesius and Bateman, as three varieties of the genus molluscum. In this attempt he has signally failed; he has succeeded only in bringing together the most heterogeneous materials, under an unmeaning title, a title that would be far better abolished altogether from cutaneous pathology. His three proposed varieties are *tubercula fongosa*, *tubercula atheromatosa*, and *tubercula variegata*. Under the first of these, which, to illustrate his meaning, should have been *fungiformia*, he has assembled the Amboyna pox, the cases of Tilesius and Alibert, the cancer mollusciforme! of Rayer, the cases of Biett, Cazenave, Schedel, and Gibert, and the molluscum pendulum of Willan. Under the second variety, he groups those cases which have been assumed to be contagious, namely, those of Bateman and

Thomson; and he reserves the third designation for his new variety, the "tubercules bigarrés," which I have already transferred to a more appropriate place, namely, the section treating of sebaceous ichthyosis.

Cases observed by Dr. Henderson.[1]—Dr. Henderson has seen five cases of this disease identical in their characters with those which fell under my notice, and closely corresponding with those of Bateman. They all occurred in the children of poor persons; and the finest case was that of an orphan boy, eight years of age, an inmate of a workhouse. Relative to contagion Dr. Henderson speaks with caution. Three of the children were members of the same family; one was a neighbor's child; the remaining one, the orphan child, was an isolated case. The children who exhibited the molluscum in the most marked degree, were very unhealthy, having a tumid abdomen and tubercular deposits. The two youngest, twins, died of acute hydrocephalus, the orphan boy of peritonitis and other serious disease. One of the twins had only two tubercles, the other twelve on the face and one on the ankle; the two other children had only one each, but in the orphan boy there were considerable numbers. They were principally situated on the lower part of the abdomen, the organs of generation, and the inner sides of the thighs; in these regions there were three or four dozen; on the right arm there were four, on the left ten. They varied in size, from a millet-seed to a pea; they were, for the most part, rounded in form, constricted around the base, and had each a small dark-colored central point, from which might be squeezed a little milky fluid. On the back was an elliptical swelling of large size, measuring one inch and a half in its long diameter, and one inch and a quarter across. In the centre of this swelling was a small elevation, a kind of crater, and at the apex of the latter an excretory opening, through which might be squeezed a quantity of soft white substance resembling finely-ground rice, boiled.

Examining the structure of these little tumors, Dr. Henderson found them to consist of vertical cells opening towards the centre, and discharging their contents into a common cavity, which communicated with the exterior by the excretory opening. The large tumor was lobulated in structure, and upon its under surface had the "general appearance of a conglomerate gland;" it illustrated, on a "larger scale, the conformation of the smaller ones." The contained matter of these tumors consisted of nucleated cells, which, according to Dr. Paterson, were about the $\frac{1}{1000}$ of an inch in diameter. Dr. Henderson inoculated with some of this matter, but without producing any result; and he remarks, very justly, that if the disease be considered to be an affection of the sebiparous glands alone, the inoculated substance would not be likely to take effect, unless it were brought in contact with the internal surface of a sebiferous duct.[2] Some excellent figures accompany this paper; numbers 1 and 5 are admirable for their truthfulness.

[1] Edinburgh Medical and Surgical Journal, vol. lvi., 1841, p. 213.

[2] A more effectual mode of inoculation would be to rub the secretion briskly into the skin in a situation where sebiparous glands are abundant.

Cases observed by Dr. Paterson.[1]—This physician records five cases of molluscum contagiosum. The first he saw in a child eighteen months old, robust and healthy, and the daughter of cleanly parents, the father being a fisherman. The little tumors had the pathognomonic form, the constricted base, the central aperture, and the oozing of milky fluid. They varied in size from that of a pin's head to that of a horse-bean, the smaller ones resembling "pearly granulations" (sebaceous miliary tubercles). They were seated chiefly on the face and neck, and were not painful on being touched. After the appearance of the disease in the child, some tumors of the same character were detected on the breast of the mother at which the child sucked. The bulk of these latter varied from a pea to a hazel-nut, and on being pressed exuded the same milky fluid. A second instance of these little tumors occurred in a female child of two years old. They were between thirty and forty in number, and were distributed on the neck, shoulders, face, and trunk. Their development is ascribed to being nursed by a girl who had some tumors on her skin. The third example is not so satisfactory; it is that of a young man who had several little tumors on the penis, which he said resembled similar tumors situated on the vulva of his wife. Dr. Paterson inoculated with some of the milky fluid, but without producing any effect; he gives an admirable description of the minute structure of these tumors, and their contents, and a beautiful figure of the disease.

The remarkable case of albuminous sarcoma of the integument, of nearly the entire body, described by Mr. Hale Thomson,[2] under the title of "albuminous molluscum," and the case of carcinomatous integumentary tumors, detailed by Dr. Turnbull,[3] physician to the Huddersfield Infirmary, must be referred to a group, embracing *diseases in the form of tumors affecting the integument in common with other tissues of the body.* They do not necessarily originate in the skin; indeed, they more frequently take their origin in the subcutaneous textures; they are not limited to the skin, but involve adjacent tissues; and they are generally met with in other parts of the body as well as the integument.

Since the publication of the first edition of this work, I have repeatedly seen and treated the little tumors described in the preceding pages. Nothing is more easy than their removal, and of their non-contagious nature there cannot be a second opinion.

SEBACEOUS ACCUMULATIONS sometimes present themselves in another form, wherein the sebiferous duct and related hair-follicle are dilated to an enormous extent, and, pressing on the structure of the gland, finally cause its atrophy and absorption: these sebaceous accumulations attain considerable magnitude; they are generally oval in form, and sometimes measure upwards of an inch in diameter. Their precise seat is the tissue of the derma, and they are more or less flattened by compression between the deep layer of the corium

[1] Edinburgh Medical and Surgical Journal, vol. lvi., 1842, p 279.

[2] Lancet, vol. ii., 1841. The paper is illustrated with two excellent lithographic drawings.

[3] Edinburgh Medical and Surgical Journal, vol. lvi., p. 463.

within and the surface of the skin without. The follicular sac is filled with a white and concreted substance, which is more or less apparent through the dilated aperture of the duct. The opening of the duct, however, bears no proportion to the size of the accumulation, and, from the little projection of the impacted substance, is the principal indication of its existence. The walls of the sac are extremely thin, and are lined in their interior with epidermis. Sometimes they are beset with hairs.

On examining the contents of one of these sebaceous sacs, I was much struck by finding the contained substance laminated in structure, and presenting a silvery hue. The lamination of the substance afforded me a convincing proof that the mass was a product of the lining membrane of the sac, and its silvery brilliancy further led me to believe that it must be composed of epidermal scales. The microscope established the correctness of this conclusion. Hence, a disease, originally a disorder of a sebiparous gland, and of its secretion, subsequently becomes one of the hair-follicle.

TREATMENT.—The concreted substance may be removed without much difficulty, by means of a small scoop introduced through the aperture. If the aperture be small, it must be dilated or enlarged by means of a trifling incision. After the removal of the concreted mass, the internal surface of the sac should be touched with nitrate of silver or potassa fusa.

CORNUA HUMANA.

Human horns.

When the sebaceous substance impacted in the dilated sac of a sebiferous duct or hair-follicle in the manner just described, is, by a continuance of the process of formation, forced through the aperture of the sac, it desiccates in that situation, hardens, and is converted into horn. By the addition of fresh layers from below (the formative power having increased by the removal of superficial pressure), the indurated mass is still further forced outwards, dilating the aperture as with a wedge, and finally increasing in size to that of the entire base of the hypertrophied follicle. The process of formation of new epithelial layers by the walls of the follicle, now become the base of the mass, will go on, unless interrupted by surgical interference, for years, and in this manner those singular bodies, of which so many remarkable examples are on record, *horns*, are produced.

A well-marked instance of *horn* was shown to me by Mr. Barklimore, of Bloomsbury, during the month of October of the year 1843. The patient was an old female servant in his family, fifty-seven years of age, and gave the following history of her case: At the age of five-and-twenty, on the termination of a severe attack of illness, she observed a small elevation, like a pimple, on the site of the present growth; the pimple increased in size, was somewhat painful, and in about ten years from its first appearance burst, and discharged matter resembling "mashed potato." Subsequently, a cavity always remained, from the bottom of which "scurfy" substance could be raised by the

finger nail. At the beginning of the current year the present growth made its appearance in the situation of the cavity, and, increasing in size, gave her much pain and uneasiness. The skin around it was red and inflamed, and she applied a poultice, which had the effect of making it grow faster. During the summer she suffered much from frequent jerks which the growth received from her dress, and awkward blows which it sustained, and in the month of October applied to her master for relief. At this period the growth had acquired considerable size: it was situated on the upper and front part of the thigh, and presented the appearance and characters of horn. It was semi-transparent, yellowish in color, dense and horny in texture, ribbed on the surface, insensible to the pressure of the nail, and firmly rooted in the skin. In general appearance it resembled the broad and curved beak of a bird, of large size, and had a broad and extensive base. Around the base the integument rose to the height of several lines, and in two places to half an inch. The skin was thin and attenuated, as though from the effects of stretching, the epidermis being continuous with the surface of the horn, and gave the idea of a degeneration of the integument into the horny structure.

On the 12th of October I removed the horn, by cutting through the integument around its base, and dissecting it from the subcutaneous tissue. The removal was speedily and easily accomplished, as the growth was limited inferiorly by the under surface of the corium.

On examining the horn after removal, I found its base to be formed by the deep stratum of the corium, so that it was obviously a cutaneous formation. The base was oval in shape, and measured in long diameter one inch and a half, and in the opposite direction one inch and a quarter. The horn was two inches and three quarters in length, by two inches in greatest breadth, and its elevation above the surface was one inch and a quarter. The latter measurement was that of the vertical thickness of the horn; for, in consequence of its mode of growth, its long diameter lay parallel with the surface of the skin. The sebaceous accumulation must originally have formed a prominent tumor, from the side of which the protrusion took place; the thin integument covering the other half still retaining its elevation from distension. Traces of this mode of formation are still apparent upon the surface of the horn. Subsequently the thin integument became inflamed and ulcerated, and receiving no granulations from beneath, desiccated upon its horny contents. The ulceration was the cause of the redness and pain of which the patient complained, and its extent is marked upon the horn by a rough, discolored surface of a circular figure, surrounded for more than two-thirds of its extent by a margin of thinned integument. The weight of the horn was six drachms.

The section of the growth presents all the characters of horn; it is laminated longitudinally, the laminæ being distinctly traced, by their difference of tint, from the base to the apex. At the apex, it is split in the direction of its laminæ, and several external lamellæ are partly separated from those beneath.

In minute structure it is composed of flattened epithelial cells, closely condensed, and in some parts having a fibrous arrangement.

The epithelial scales are somewhat larger than those of the epidermis, and possess nuclei; a circumstance which confirms the analogy between the inflected follicles of the skin, and those larger inflections lined by mucous membrane. The flattened cells measured in long diameter from $\frac{1}{700}$ to $\frac{1}{300}$ of an inch; and in short diameter from $\frac{1}{1000}$ to $\frac{1}{350}$; the average of these measurements being $\frac{1}{500}$ for the long, and $\frac{1}{650}$ for the short diameter. The nuclei are, for the most part, oval in shape, the long diameter measuring $\frac{1}{2500}$, the short $\frac{1}{3300}$ of an inch.

I made no chemical analysis of the horn in the present case, but this has been done repeatedly on the Continent. M. Dublanc has published an analysis of human horn in the *Journal de Pharmacie*,[1] and another analysis was[2] made of a horn, which is deposited in the Dupuytren Museum. Both analyses go to show that human horn is chiefly composed of albumen, a small quantity of mucus, phosphate of lime, chloride of sodium, and a trace of lactate of soda.

Since the occurrence of the above case, I have met with several instances of horn in the human subject; one was on the shoulder, two at the root of the nose, and one on the penis. The latter measures in its dried state one inch in length. I have also in my possession, the contribution of an unknown friend, a fine specimen of horn which grew "on the head of an adult male during the period of nine years."[2] It looks as if it had been broken away from its attachment, and is twisted like a ram's horn. It measures, in its dried state, somewhat more than four inches and a half in length, and two inches and three-quarters in its greatest circumference.

Fig. R.

The subject of horns in the human person very early attracted the attention of observers, and their occurrence seems to have been more frequent among our forefathers than at the present day. This circumstance may be explained by referring to the improvement which has of late years been made in surgery, and to the more general diffusion of a knowledge of its elementary principles. On a recent occasion, namely, the presentation of a paper to the Royal Academy of Medicine of France, by M. Lozes, the committee appointed to inquire into this subject collected seventy-one observations of horny growths from the skin, of which thirty-seven were met with in females, thirty-one in males, and three in infants. Of this number, fifteen were seated on the head, eight on the face, eighteen on the lower extremities, eight on the trunk, and three on the glans penis.[3]

In pursuing this inquiry, I have succeeded in collecting ninety cases, of which forty-four were females, and thirty-nine males; of the

[1] March, 1830.

[2] Cruveilhier, Anatomie Pathologique, liv. 24, vol. 2; and Jour. de Méd. Prat. de Bordeaux, 1835.

[3] Mémoires de l'Académie Royale de Médecine, Juin, 1830.

remainder the sex is not mentioned. Of this number, forty-eight were seated on the head, four on the face, four on the nose, eleven on the thigh, three on the leg and foot, six on the back, five on the glans penis, and nine on the trunk of the body. The greater frequency of this disorder among females than males is admitted by all authors, but this fact is most conspicuously shown in the instance of the thigh and of the head; for example, of the eleven cases of horny growth from the thigh, two only were males; and of the forty-eight affecting the head, twenty-seven occurred in females, and nineteen in males; in the remaining two the sex being unmentioned. That old age is a predisposing cause of the affection, is proved by the greater frequency of its occurrence in elderly persons; thus, of the forty-eight cases in which the scalp was the seat of the growth, thirty-eight were above the mid-period of life; several were over seventy, and one was ninety-seven;[1] three were young persons,[2] and three were infants.[3]

Cruveilhier, remarking on the relative frequency of these growths on different parts of the skin, states that they occur on the posterior and inner part of the thigh, as often as on all the other regions of the body taken together, a circumstance which he attributes to the general use of the chaufferette. But Cruveilhier's statement is not borne out by facts, and numerical data are, as we have seen above, opposed to his opinion. Moreover, he confounds horns with warts and corns, and regards them as the result of cutaneous irritation, and enlarged papillæ, with increased secretion of epidermis.[4]

Several authors have mentioned the development of horny growths from old encysted tumors, and have remarked upon their frequent association with such tumors. Sir Everard Home[5] was particularly struck with this circumstance; it was present in all the cases which he examined, but he fails to account for the horny secretion, which he regards as an imperfect substitute for epidermis. Thomas Bartholin, who collected several cases of human horns, speaks of the origin of one from an encysted tumor,[6] and Soemmering,[7] Gastellier,[8] and Caldani,[9] notice the same fact.

Some curious speculations were excited in the minds of the older physicians by the observation of cases of horny growths. Rhodius[10] met with a Benedictine monk who had a pair of horns, and was addicted to rumination, and Fabricius,[11] having seen a man with a horn growing from his forehead, whose son ruminated, is willing to give the father the credit of transmitting this disposition to the son, by virtue of the ruminant character which he bore so obviously upon his head.

[1] Gastellier, Hist. de la Soc. Roy. de Méd., vol. i., p. 311, 1776.
[2] Aldrovandus et Bartholinus.
[3] Amatus, Cent. 1, Cur. 1, Zacutus Lusitanus, Prax. Med. Adm., lib. iii., obs. 83. Joseph Lanzoni, Nat. Cur. Ephem. Germ., ann. 4, 1673.
[4] Loc. citat.
[5] Philosophical Transactions, vol. lxxxi., p. 95. 1791.
[6] Epistolis.
[7] Archives Générales de Méd., vol. xiii. 1827.
[8] Loco citato.
[9] Dict. de Méd., art. Cornée.
[10] Bartholinus, de unicorn. aphor.
[11] De ventriculo. Also, Bartholinus, de unicorn. aphor.

The most remarkable case of human horn on record is that of a Mexican porter, named Paul Rodriguez.[1] The horn was situated upon the upper and lateral part of the head, was fourteen inches in circumference around its shaft, and divided above that point into three branches. Voigtel[2] cites the case of an old woman who had a horn with three branches growing from her forehead; and M. Dubois[3] had a woman under his care, in the Hospice de Perfectionnement, with a horn that measured seven or eight inches in diameter at its base, and was six inches in length. The length of the horn, in some recorded instances, is also remarkable. Sir Everard Home[4] saw two cases, in both of which the growth measured five inches, by one inch in diameter. They were curled, and had the appearance of isinglass. In one case the horn was fourteen years growing. Dr. Gregory,[5] mentions a horn which was removed from the temple of a woman in Edinburgh, and measured seven inches. Dr. Chariere,[6] of Barnstaple, saw one growing from the nape of a woman's neck, which measured seven inches. A horn said to be preserved in the British Museum measures eleven inches in length, by two and a half in circumference;[7] and Bartholin,[8] Faget, and several other writers, have spoken of horns twelve inches long. A singular instance of horn is mentioned by Cruveilhier, in his *Anatomie Pathologique*, as falling under the notice of Dr. Faget, of Bordeaux. The subject was a Mexican Indian, and the horn was situated in the lumbar region, on the left side. After growing for three years, it had attained a length of four inches, by seven or eight inches in circumference, and was sawn off by the patient's son; after another three years it was submitted to a similar operation, and at the end of nine or ten years from its first appearance, was extirpated by M. Faget. The portion removed by M. Faget, with the two portions previously cut off, amounted in length to about twelve inches.

In a scarce tract in small quarto, published in 1676, there is "a brief narrative of a strange and wonderful old woman, that had a pair of horns growing upon her head." "This strange and stupendous effect," continues the pamphlet, "began first from a soreness" of the back part of the head where the horns grew. "This soreness continued twenty years, in which time it miserably afflicted this good woman, and ripened gradually into a wen, near the bigness of a large hen-egg, which continued for the space of five years, more sadly tormenting her than before, after which time it was, by a strange operation of nature, changed into horns, which are, in show and substance, much like ram's horns, solid and wrinkled, but sadly grieving the old woman, especially upon the change of weather." The horns were shed four times; the first "grew long, but as slender as an oaten straw;" the second was thicker, and on the fall of the latter, two were produced which were broken off by accident. One of these was presented to the King of France, the other is stated to have been

[1] New York Medical Repository for 1820.
[2] Handbuch citat.
[3] Dictionnaire de Médecine, art. Cornée.
[4] Loco citato.
[5] Sir E. Home's paper; loco citato.
[6] Eodem loco.
[7] Eodem loco.
[8] Epistolis.

nine inches long, and two inches in circumference. The periods of shedding were three, four, and four years and a half. There is an engraving of this woman in Dr. Charles Leigh's Natural History of Lancashire, Cheshire, and the Peak of Derbyshire. Her portrait, and one of the horns, is in the Ashmolean Museum, and another of the horns in the British Museum.

The authors who have given their attention to this curious subject are more numerous than might be expected. Bartholinus and Borellus have each collected numerous cases. Vicq d'Azyr[1] treats of the subject in his essay on *Animal Concretions*, in 1780; Franc,[2] in an essay *de Cornutis*, in Heidelberg; Sir Everard Home, in the *Philosophical Transactions* for 1791; Alibert, in his *Précis Théorique et Pratique des Maladies de la Peau;* Rudolphi,[3] in a paper read before the Academy of Sciences of Berlin, in 1815; Dauxais, in a thesis, published in Paris in 1820; Breschet, in the article "Cornée," in the *Dictionnaire de Médecine;* Cruveilhier, in his *Anatomie Pathologique.* The latter author devotes the whole of his twenty-fourth fasciculus to horny growths. And Sir Astley Cooper and Mr. Travers in their Surgical Essays.[4]

The following case is strikingly illustrative of the mode of growth and appearance of a horn when developed on the face. Louise Marino, an Italian peasant; fifty-four years of age, perceived, in the month of January, a small tubercle of about the size of a millet-seed imbedded in the integument of the root of her nose. The tubercle was attended with a trifling degree of pain and pruritus, but continued to grow with considerable rapidity. On the 30th of October (same year), it had acquired the length of an inch, was of a grayish-brown color, had the diameter of a writing quill, was grooved along its under surface, and curved like the beak of a bird of prey. It adhered firmly by means of a narrow base to the skin and subjacent cellular tissue. Dr. Portal removed it by incision; the cellular tissue at its base, the periosteum and bone, were perfectly sound.[5]

A similar case to this, in so far as seat and mode of appearance are concerned, has just come under my care. Finding the horn imperfectly adherent to its base, I displaced it with my nail, and applied caustic to the surface of the sac, from which it had originated. This treatment was successful in preventing its return. Another case of horn has lately been recorded by Mr. Dalby,[6] of Ashby de la Zouch, under the incorrect term of "ichthyosis cornea." The horn was six inches in length, and two and a half in circumference; it originated in an encysted tumor and grew from the back part of the scalp of an old lady, seventy years of age. At one time it gave rise to so much pain when touched, that she could not bear to lay her head on her pillow. Mr. Dalby's narration is accompanied by a wood-engraving.

TREATMENT.—The examination of the case mentioned in the preceding pages, by showing the true nature of the growth, suggests the appropriate mode of treatment, and proves, at the same time, that the

[1] Hist. de la Soc. Roy. de Méd., p. 184. 1780–81.
[2] Tract. Philolog. Med. de Cornutis.
[3] Vol. ii.
[4] Part 2.
[5] Il Filiatre, Sebezio, February, 1842.
[6] Lancet, vol. ii. 1850, p. 342.

practice heretofore adopted, of removal by incision, is altogether unnecessary. It is plain that the indications to be pursued are, 1. To soften and dissolve the horn, that it may be displaced without force, from its follicular bed; and, 2. To modify the secreting surface, in such-wise as to prevent the continuance of the process of abnormal cell-formation. The first of these indications is to be fulfilled by means of alkalies and water-dressing, or by a poultice; the second by the stick of nitrate of silver. By these means the growth may be removed, the disposition to its reformation checked, and a painful operation avoided.

(B.) *Retention of secretion in the sebiferous ducts, the excretory aperture being closed.*

TUBERCULA MILIARIA.

Syn. *Exormia milium*, Mason Good; *Grutum*, sive *milium*, Plenck; *Follicular elevations*, Rayer; *Pearly tubercles*. *Der Gries*, Germ.

Little tubercles of a white color, of about the size of a millet-seed, and sometimes of a small pea, caused by the collection of the sebaceous substance within an excretory follicle, the aperture of that follicle being impervious, are very commonly met with on the face and neck of women and children, and persons having a thin and delicate skin. Rayer calls them follicular elevations, but I have thought the term *sebaceous miliary tubercles* more appropriate. A very common seat of these little elevations is the thin skin of the lower eyelids, where they sometimes attain an inconvenient size. I have seen several cases in which the movements of the lid were interfered with by their growth. They are easily removed by puncture with a fine lancet, and gentle pressure; the operation is by no means painful, for the integument covering them is reduced by distension to a mere film. Touching the interior of their sac with a fine point of nitrate of silver effectually prevents their return; or if they be too numerous for this operation, the attempt may be made to disperse them by means of a weak solution of bichloride of mercury in almond emulsion.

In place of sebaceous substance more or less inspissated, it sometimes happens that the secreted matter partakes rather of the calcareous character, CALCAREOUS MILIARY TUBERCLES, being more or less dense and hard, and containing carbonate and phosphate of lime in combination. Meckel found a number of these concretions in the skin of the gluteal region, and Voigtel[1] records an instance as occurring on the forehead, and root of the nose. Dr. Julius Vogel[2] has described another case of this disease affecting the scrotum. The integument of the scrotum was the seat of severe itching; on the cessation of the itching a number of small conical tubercles were developed, which increased to the magnitude of a pea or hazel-nut. After reaching maturity, the little tubercles wasted and became dry, and were followed

[1] Handbuch der Pathologischen Anatomie.

[2] Algemeine Zeitung fur Chirurge innere Heilkunde und ihrer Hülfswissenschaften, July, 1841.

from time to time by successive crops. At the period of detailing the case, they were one hundred and fifty in number, seated in or beneath the corium. The contents of the tumors were a white, greasy, and softish substance, like atheroma. Examined chemically, it was found to consist of carbonate and phosphate of lime, with a trace of soda, a small portion of fat, and some extractive matter.

Dalrymple called attention to a similar fact in relation to a small encysted tumor of the eyelid, and showed the seat of the calcareous matter to be the epithelial scales of which the tumor was composed. Instead of presenting their natural transparency, the scales "were thickened and hard, and contained granular, earthy molecules, which could be removed by immersion in weak muriatic acid." Gulliver ascertained the earthy matter to be phosphate of lime, with a trace of the carbonate of the same earth.[1] Dalrymple informed me that he had, since the publication of the preceding, seen a second instance of the same disease.

TUMORES SEROSI.

Syn. *Milia. Phlyctenulæ.*

Sometimes, instead of sebaceous or calcareous substance, the excretory follicles of the sebiparous glands are distended with a limpid serous fluid, and attain the size of millet-seed or small grapes. A gentleman lately consulted me, in whom there were two of these grape-like cysts, connected with the border of the upper eyelid; they were semi-transparent and tense, and interfered with his vision. I punctured them with a cataract needle, and, after the escape of the fluid, touched the shrivelled cysts with nitrate of silver; the integument soon healed, and they are not likely to reappear. The same method of treatment is applicable to the smaller kind.

Occasionally, the fluid is contained in a transparent cyst, so extremely firm that the tumor is unable to increase to the size above indicated; and the tension of the sac is so great that it appears to have the density of cartilage. The integument covering these little tumors is extremely attenuated and semi-transparent, and small vessels are seen meandering over their surface. Their size, transparency, and hardness have suggested the terms by which they are commonly known; namely, *chalazion*, or *grando*, hailstone. Their treatment is the same as that of the miliary and serous cysts, namely, puncture and the application of a point of nitrate of silver.

TUMORES SEBACEI.

Syn. *Emphyma*[2] *encystis*, Mason Good. *Encysted tumors. Follicular tumors. Wen. Meliceris. Atheroma. Steatoma.*

These tumors, identical in manner of formation with the sebaceous miliary tubercles, but somewhat more deeply seated in the integument,

[1] Medico-Chirurgical Transactions, vol. xxvi., 1843, p. 238.

[2] Der. φύω, produco, erumpo. Mason Good applies the term *emphyma* to a tumor originating below the integument; and *ecphyma* to a tumor confined to the integument: therefore, he is in error in naming the encysted tumor emphyma; it should be, ecphyma.

attain to the size of a hazel-nut or walnut, and sometimes the magnitude of a small orange. They may occur singly, or several may be developed in the same person, particularly when situated on the head. Their common seat is the scalp and face, but they are occasionally seen on other parts of the body. A few years since, I removed one of large size from the integument of the back, and have also seen them on the abdomen and in the groin.

The sebaceous substance collected in these sacs is variously altered in its qualities or appearance. Sometimes it is limpid and fluid, like serum, and contains crystals of stearine; at other times it is soft and white, reminding us of pap, or bread sauce, this constitutes the *atheromatous* tumor; again, it is yellowish, and resembles softened bees-wax, the *melicerous* tumor; or it may be white and fatty, the *steatomatous* tumor; at other times, it presents various peculiarities of character, more or less referable to the above heads. The parietes of these cysts are the walls of the excretory duct of the sebiparous gland and related hair-follicle, in a state of hypertrophy, lined in the interior with epidermis. The sebaceous substance which they contain is mingled with epidermal scales and hairs, having a similar origin to those found in the sebaceous accumulation of comedones. The contents of the cyst are often exceedingly fetid, and the fetor is increased when the tumor inflames. In consequence of the pressure exerted on the scalp by these tumors, the neighboring hair-follicles are frequently destroyed, and the superjacent skin becomes bald.

The encysted tumors of the eyelids, and some of the polypi of the meatus auditorius, are of the same nature.

TREATMENT.—The common practice in the treatment of these tumors is to dissect them out, and this is usually done with care, under the impression that a particle of the cyst left behind will grow, and develop another tumor. This reasoning is most unphilosophical, and I doubt if empirically it be correct. A portion of the cyst left behind may interfere with the healing of the wound, but a portion of cyst can possess no power of reproducing a dilated and hypertrophied hair-follicle and excretory duct of a sebiparous gland. The removal of these tumors is always a painful operation, and in certain cases, when seated in the scalp, dangerous, from the possibility of the occurrence of erysipelas. I have generally succeeded in curing encysted tumors by laying them open with a lancet or bistoury, pressing out their contents, and injecting the cyst with a solution of nitrate of silver, or touching its internal surface with the solid caustic; and this plan I prefer to the painful process of excision.

The contents of these tumors are sometimes too dense to be simply squeezed out, and not unfrequently they are soft in the centre and as dense as horn in the circumference, looking, in fact, like a horny or cartilaginous sac inclosing the softer material. When this is the case, after laying open the tumor, I pinch the edge of the horny cyst, and gently draw it outwards, while, at the same time, I press back a thin fibrous membrane by which it is invested; in this way the whole of the horny cyst may be removed at once, and all subsequent inconvenience prevented; for, when completely removed in this manner the

application of caustic is unnecessary, and the wound heals, without further attention, in a few days. It may be necessary to remind the young operator that the incision, which is least painful when effected by puncture with a narrow-bladed knife, should be made in the direction of the hair. The operation, neatly performed, is so little painful, that I have sometimes removed as many as six or eight in a young lady at a single sitting.

V. INFLAMMATION OF THE CUTANEOUS FOLLICLES WITH DERANGED EXCRETION OF THE SEBACEOUS SUBSTANCE.

The only disease coming strictly under this definition is Acne.

ACNE.

Syn. *Ionthus. Varus. Couperose*, Fran. *Hautfinne, Kuperfinne im Gesicht*, Germ. *Whelk.*

Acne (Plate XIV.) is a chronic inflammation of the follicles of the skin, arising from impaction of the sebaceous substance. It is characterized by the eruption of hard, conical, and isolated elevations, of moderate size, and various degrees of redness. The apices of the elevations generally become pustular, and burst, while their bases remain for some time in an indolent state before they disappear. On the apices of some of these elevations the opening of the follicle is distinctly apparent, while in others the aperture is destroyed by the pustule. In some the purulent fluid is mingled with softened sebaceous substance, while others subside slowly without suppuration. Some, again, scarcely differ in tint of color from the adjacent skin, while others are highly congested and surrounded by an inflamed base of vivid redness.

Acne is usually accompanied with other signs of disorder of the cutaneous follicles: thus, in some situations, the glands appear to be excited to undue action, and pour forth an inordinate quantity of secretion, which gives the skin a glossy appearance; in others their action is torpid, the sebaceous matter is concreted into a solid form, and distends the excretory duct and hair-follicle even to the orifice, where, coming in contact with the dust and dirt diffused through the atmosphere, the concreted matter is discolored, and has the appearance of a brownish or black spot. If a fold of skin including any one of these black spots be pressed between the fingers, the concreted matter is forced out, and resembles a small white maggot with a black head. These concretions are popularly known as maggots or grubs. Moreover, in this state of skin, a number of small, white, sebaceous miliary tubercles may also not unfrequently be observed.

The term acne seems to be derived from ἀκνή or ἀκμή, as though it would imply that which is indeed the fact with regard to this disease, namely, that it prevails during the mid-period of life, from the age of puberty to the commencement of old age. It may be developed on all parts of the body, but is most frequently met with where the integument is thick, as the back, shoulders, backs of the arms and

forearms, breast, or those parts which are exposed to the influence of the atmosphere, as the face and neck.

The varieties of acne, according to Willan, are four in number, namely, acne simplex, acne punctata, acne indurata, and acne rosacea. The first three are mere modifications of the same form of disease; indeed, the same elevation may, at different periods of its growth, present each of the appearances indicated by these designations. I shall therefore take the more simple course of describing the affection as appearing under two principal forms, namely,

Acne vulgaris,
Acne rosacea.

ACNE VULGARIS.

Syn. *Ionthus varus simplex et punctatus*, Mason Good. *Whelk. Stone-pock.*

The common variety of acne (Plate XIV., A. G.) commences by small red and inflamed elevations, which gradually become prominent and conoid, and secrete a small quantity of pus at their extremity, while the base remains hard and of a deep red color, and is surrounded by an inflamed areola of small extent. The suppuration is slow in attaining its completion, usually continuing for six or eight days; at the end of this period the pustule bursts, and the effused fluid desiccates into a thin brownish scab, which leaves at its fall an indolent tubercle of a purplish livid hue (ἰονθος ab ἰον, viola), and frequently a small white and permanent cicatrix. The tubercle remains for a considerable period after the rupture of the pustule, and disappears very slowly. The eruption of acne is generally unaccompanied by pain or heat, and gives rise to little inconvenience beyond that which is caused by its unsightly appearance. When, however, it is developed near a filament of a sensitive nerve, as of the fifth, upon the forehead, the pain is sometimes very distressing. The elevations of acne are for the most part successive in eruption, and may be observed at the same moment in all their stages; at other times, and more rarely, a numerous crop may be developed at once.[1]

It frequently happens that in the centre of each of the conical elevations, and always in some, a small round blackish spot may be perceived. The presence of this spot is the especial characteristic of *acne punctata*[2] (Plate XIV., A. B. C.); it is the aperture of a hair-follicle, distended with inspissated sebaceous substance up to the level of the skin, and discolored at the surface by exposure to the dust and dirt contained in the atmosphere. After having suppurated and discharged the sebaceous substance, the elevations diminish in size; they become purplish and livid, and, at a later period, whitish in color, and disappear by degrees. The punctated form of acne is generally intermingled with that in which the excretory puncta are obliterated.

[1] For a good example of acne vulgaris, presenting at the same view all its various forms, see "Portraits of Diseases of the Skin." Plate XXXIX., I.

[2] Acne punctata, or maggot pimple, is consequently a comedo, with the superaddition of inflammation of the cutaneous follicle.

Occasionally, the eruption is remarkable for the indolence of its course; the inflamed elevations are very hard, and deeply rooted in the integument; the suppurative stage is prolonged two or three weeks before reaching its height, and frequently fails altogether, and after suppuration is completed the purplish or livid tubercles continue for months, sometimes becoming permanent, and at other times leaving indelible cicatrices; this is the *acne indurata* (Plate XIV., D.) When the indolent form of acne affects the face extensively, the features are disfigured; the entire surface is more or less covered with tubercles of a deep red or livid color and variable size, and the integument between the tubercles is thickened and congested. The face and back are the more common seat of this eruption.

ACNE ROSACEA.

Syn. *Ionthus corymbifer*, Mason Good. *Bacchia.* *Gutta rosacea.* *Rosy-drop.* *Carbuncled face.* *Grog-blossom.* *Bubukle.*[1]

Acne rosacea (Plate XIV., H.) is especially characterized by the redness and congestion which attend its conoidal elevations; by the enlargement and frequently varicose state of the veins of the derma; by the tardiness of course of the papular elevations; the slowness of their suppurative stage, and the indolent character of the livid and indurated tubercles which they leave behind. The integument around the elevations is of a deep purple or violet hue, the congestion is increased by a continuance of the causes which gave rise to the disease, and the skin of the affected parts becomes permanently thickened, uneven, and tubercular. The more usual seat of acne rosacea is the nose, which is often considerably enlarged by the morbid action; the integument and subcutaneous textures become infiltrated and hypertrophied, and the cutaneous veins tortuous and varicose. From the nose the disease extends to the cheeks, forehead, chin, indeed to the entire face, disfiguring the features very seriously.[2] The congestion of acne rosacea is increased towards evening, by taking food, and by the use of every kind of stimulant taken internally.

DIAGNOSIS.—The diagnostic characters of acne, are, the conoidal form of the inflamed elevations, the suppuration of some of these elevations at their apices, the tardy growth and disappearance of others, the livid and indolent tubercle left behind by both, their evident seat in the cutaneous follicles, and the disorder of neighboring sebiparous glands evinced by the increased secretion of some, the concretion of the secretion of others, and the presence of sebaceous miliary tubercles. The particular characters distinguishing the varieties of acne are, the absence of any appearance of excretory follicle in acne vulgaris; the presence of an excretory aperture in acne punctata; the indolent course of acne indurata, and the general distribution of all these varieties over the surface of the body. Acne rosacea is distinguished from the preceding by the greater vascularity of the elevations, the

[1] "His face is all bubukles and whelks, and knobs, and flames of fire."—SHAKSPEARE.
[2] "Portraits of Diseases of the Skin." Plate XL., AP.

congestion and thickening of the surrounding skin, and the especial seat of the eruption on the face.

CAUSES.—Acne vulgaris is developed at all ages between the period of puberty and the fortieth year, and occurs in both sexes, more frequently, perhaps, in the female than in the male. Acne rosacea is a disease of adult life, and is also more frequent in the female than in the male. The presence of acne indicates a disordered state of cutaneous innervation, and, consequently, of the vascular action of the skin; in some instances it is induced by direct congestion of the integument, as in acne rosacea, while in others it would seem to depend on torpidity of the capillary circulation, and obstruction of the current of blood by sudden and irregular excitation. Torpidity of the capillary circulation is indicated by the altered secretion of the sebiparous glands, which so constantly accompanies the disorder, and, indeed, by the general want of cutaneous activity in persons so affected. The latter cause is present for the most part in the acne of young persons, in that which occurs at puberty, or as a consequence of close application and sedentary employment, or mental fatigue. This kind of disorder of the cutaneous functions is also associated with amenorrhœa.

Congestion, on the other hand, is the active agent in the eruption when arising from general plethora, from the partial plethora which occurs at the critical period of life in females, from exposure of the face to heat, from excesses in diet or stimulating drinks, from the use of cold drinks in a heated state of the body, and from the local application of irritating substances. Of the latter it is proper to mention the abuse of certain stimulating washes and powders employed as cosmetics. Partial congestion would seem to be the exciting cause of the eruption, when it is induced by irritation of the gastro-pulmonary mucous membrane.

PROGNOSIS.—Acne vulgaris is removed with difficulty; the rosaceous variety is less intractable.

TREATMENT.—The treatment of acne must be adapted to the cause of the affection; in those cases in which a torpid action of the cutaneous system is evident, stimulating remedies must be employed, whereas in those which are dependent on congestion, stimulants would be injurious, and would prolong the morbid action. In both cases the regimen should be regulated; it should be moderate and nutritious, all stimulants avoided. To this hygienic management, laxatives, antacids, and tonics may be added, with a view to order the secretions, and regulate the digestive functions. Whenever other general indications present themselves, they must be especially attended to; thus, in young women at the period of puberty, the state of the uterine functions must be ascertained, and at the critical period of life derivative measures may be employed with advantage. Whenever the indication is obviously congestive, bleeding may be had recourse to locally.

In applying the local treatment, due regard should be had to the ordinary principles of surgery; when the pimple is congested and painful, it may be punctured, and the bleeding encouraged by water-dressing or poultice; and where pus or sebaceous substance is suspected to exist imbedded in the tubercle, a free puncture, succeeded

by a poultice, is especially indicated. When the local determination has somewhat subsided, stimulants may be employed; for this purpose, a lotion containing sulphur sublimatum, two drachms; camphor, one drachm; and distilled water, four ounces, is often of service; or the hypochloride of sulphur ointment; or an ointment of ioduret of sulphur, in the proportion of ten grains to the ounce of elder-flower ointment or simple cerate. In the simple, as well as in the other varieties of acne, when they present a chronic character, a solution of the bichloride of mercury in emulsion of bitter almonds, or of the same salt in eau de Cologne, in the proportion of a grain to an ounce, will be found of service. A solution of sulphur, in spirit of wine or brandy, has been recommended as a local application, but this merely acts upon the general principle of stimulation, and is inferior in every respect to the solution of the bichloride.

VI. CARCINOMA OF THE SEBIPAROUS GLANDS.

TUBERCULUM MALIGNUM.

Malignant tubercle.

In persons beyond the age of fifty, and in elderly persons, we occasionally meet with a small, hard, indolent tubercle, on some part of the skin of the face. This tubercle is evidently of a malignant nature, but differs from other malignant affections in the extreme tardiness of its progress, and the little inconvenience to which it gives rise.

The characters of the malignant tubercle are as follows: A tubercle, rounded or lobulated, elevated about one line above the surrounding skin; convex at first, subsequently flattened; hard, colorless, yellowish, or purplish, and semi-transparent, having small veins meandering over its lobulated surface; increasing slowly in circumference by the development of new lobules; superficial, being limited to the skin, and in its early stages to the superficial stratum; at first not more than two lines in diameter, commonly reaching a diameter of four or six lines, and sometimes one or two inches; during its growth becoming depressed in the centre from the fuller development of the lobulated border. Subsequently, the centre desquamates, then becomes fissured and split into several masses; from these cracks, often deep, there issues a colorless or semi-purulent ichor which dries on the surface, and forms a rugged, horny-looking crust; frequently the cracks bleed and the crust is blackened. At a more advanced period, the whole central part becomes covered with a black crust, which spreads almost to the border, leaving the latter marked by all the characteristic signs of the original disease, namely, rounded, lobulated, semi-transparent, and traversed by small venous trunks. By degrees, a slow destruction and removal of the central part of the diseased growth, scarcely amounting to ulceration or sloughing, takes place; the surface continues to be concealed from view by a thick black crust, the crust is cracked in one or two places for the exit of a sanguinolent ichor, and is separated from the growing border of the tubercle also, by a deep fissure through which the same sanguinolent ichor escapes; the fissure gives the internal edge of the border the appearance of a vertical section; sometimes this border is exca-

vated, and not unfrequently a little everted. When the black crust is removed by means of a poultice, the surface is uneven, composed of red, tumid, and bleeding granulations, sometimes assuming a fungous character, and sometimes rising in the centre above the level of the border; immediately beneath the edges the sore is more deeply excavated than elsewhere.

The situations in which I have seen the malignant tubercle are, the ala of the nose, the groove between the ala of the nose and the cheek, the tip of the nose, the superciliary ridge near the temple, the temple, the cheek, the integument immediately in front of the ear, and the integument over the mastoid process. In seven cases, the measurements were: three, four lines; two, six lines; one, an inch and a half in length, by one inch in breadth; one, nearly three inches in diameter; six occurred in the male, one only in the female. The respective periods during which the tubercles had been in existence varied between two and fifteen years.

The pain accompanying this tubercle is generally insignificant, and is rather uneasiness than pain; sometimes there is a little itching, sometimes a throbbing; in a few instances an occasional lancinating pain, but more frequently a sensation of numbness or heaviness, or a dull aching. It generally fluctuates with the state of health, being comparatively easy when the functions are regular, and painful or congested when the digestive organs or general health are disturbed. In one patient, the tumor was always painful when an attack of gout was impending, and was relieved by its outbreak.

Diagnosis.—The malignant tubercle might be mistaken for a wart, at least by the patient; not, however, by the surgeon, when the nature of the two formations is considered; the wart being a product of the epidermis, the malignant tubercle an organic alteration of the derma. I suspect, however, that some of the cases recorded as *cancerous warts* were in reality the tubercles now described. A more probable error would be, to confound it with a hairless mole; but the mole is simply an hypertrophy of the natural skin, the skin retaining its normal qualities of softness and texture; while the malignant tubercle is of cartilaginous hardness. In its crusted state, it might be taken for a dilated sebaceous follicle, and the crust for desiccated sebaceous substance, which it much resembles.

Cause.—The question of cause involves that of the pathology of the disease; it has appeared to me to originate in a sebiparous gland, to be, in fact, a cancer of the gland; and this belief suggested its consideration among the group of diseases of those glands. At first, one gland alone may be affected, then a second, a third, and a fourth become added to the first; the next step would take the immediately adjoining gland around the whole periphery of the tumor; hence, the extreme indolence of the disease at first, and its quicker growth afterwards. From the glands the cancerous degeneration is propagated to the rest of the skin, and the entire mass is involved in one diseased action. With this view of the pathology of the malignant tubercle, which I regard as a *carcinoma glandulæ sebiparæ*, we may refer its cause to a morbid process set up in the structure of the

gland. Associated with this disease, there are always indications of torpor of the skin, and irregularity of its secreting functions; and not unfrequently concretions of sebaceous substance, analogous to those of ichthyosis sebacea.

PROGNOSIS.—The malignant tubercle may be removed with the most complete success, on account of its superficial position in the skin; and there is little probability of other glands becoming affected in a similar manner. The seven cases above referred to were all successfully cured.

TREATMENT.—The malignant tubercle must be destroyed thoroughly by caustic; and, for this purpose, the potassa fusa, chloride of zinc, or nitric acid, may be employed. I have used all these caustics, and am at a loss to give a preference to either. The potassa fusa is, perhaps, the least painful, and the chloride of zinc the most so; the potassa fusa is rapid in its action, and sinks quickly into the substance of the tubercle, while the chloride of zinc produces the cleanest sore. Latterly, I have selected the nitric acid; the mode of using it is to mix it with sulphur sublimatum to the consistence of a thin paste, and apply the paste to the surface of the tubercle by means of a small glass or wooden spatula. It requires no subsequent attention, unless there be swelling and pain, in which case the part may be fomented, and covered with water-dressing. The pain lasts for five or six hours, and then ceases; and the old aching or benumbed uneasy feeling in the tubercle is found to be gone. When the eschar falls, the surface is generally healed, or nearly so, and requires only a simple dressing for a few days.

CHAPTER XXII.

DISEASES AFFECTING THE SPECIAL STRUCTURE OF THE SKIN.

DISEASES OF THE HAIRS AND HAIR-FOLLICLES.

THE hair is liable to a variety of modifications; some resulting from altered nutrition, others from inflammation, either of the formative structure of the hair, or of the hair-follicles. Mason Good groups all these alterations under the general head TRICHOSIS, the ninth genus of his class eccritica; and he defines *trichosis*[1] as a "morbid organization or deficiency of hair." These modifications, alterations, and diseases, I propose to consider, under the six following heads, namely,

Augmented formation of hair,
Diminished formation of hair,
Abnormal direction of hair,
Alteration of color of hair,
Diseases of the hair,
Diseases of the hair-follicles.

[1] Trichosis, a term employed by Actuarius, is derived from τρίχωσις, pilare malum, morbid hair; ab θριξ, pilus.

I. AUGMENTED FORMATION OF HAIR.

Augmentation of formation of the hair calls for consideration in a twofold point of view; firstly, as it relates to simple increase of quantity or length in situations naturally occupied by hair, *abnormal quantity, hirsuties;* and, secondly, to increase of quantity or length in unusual situations, *abnormal situation, nævi pilosi.*

HIRSUTIES.

Trichosis hirsuties, Mason Good. *Die Haarigkeit.*

Great variety is met with among individuals in relation to quantity of hair; in some persons the hairs are collected into groups of three, and in many situations two issue from the aperture of the same follicle; while in others the hairs are distributed singly at regular distances, and are not clustered.

In the present age, when custom and convenience call for the frequent shortening of the hair, we can form very little notion of differences involved in rapidity of growth. There can be no doubt, that in some persons the growth of hair is more active than in others, but to what extent this difference may be carried is unknown. Judging from female hair, which is permitted to grow to its full length, as well as from hair on other parts of the body, we may rightly infer, that hair left to itself grows to a certain length, and then falls off, to be replaced by a fresh growth. Withof estimates that the hair of the beard grows one line (French) in the course of a week, let us call it one line and a half (English); this would amount to six inches and a half yearly; and if we suppose, with Withof, that the hair continues to grow at this rate for fifty years, the old man of seventy must have retrenched his beard upwards of twenty-seven feet in length. Berthold states the growth of the hair in persons between the ages of sixteen and twenty-four to be nearly two lines a week, or seven lines a month, and from six to eight inches a year. He found it grow more rapidly after cutting; during the day than at night; and in warm than in cold weather.[1] Men with long hair are frequently met with at our country fairs, and Rayer quotes the following instance of remarkable development of this production: "I once saw a Piedmontese, aged twenty-eight, strongly built, having the chest broad and large, and the muscles of an athlete; the arm was above twenty-one inches, and the calf of the leg nearly two feet in circumference. This man had little beard, and the trunk was very scantily furnished with hair, but his scalp was covered with the most extraordinary crop; frizzled on purpose, it was above four feet ten inches in circumference; the hair was of a dark brown, approaching to black, extremly fine and silky."

It is interesting to remark, that increase in length of the hair is sometimes associated with disease; and in truth we know little of the

[1] Müller's Archiv. 1850.

effects produced upon the system by the habit of removal of the hair. I have known persons who always experience headache after having the hair cut, and many cases are on record in which the removal of the hair is supposed to have given rise to remarkable results. Moreau has published some excellent observations[1] on the advantages and dangers of cutting the hair; and he especially details the case of a young lady cured of mania by that operation. The hair is often found of unusual length in phthisis, and long black eyelashes are considered pathognomonic of strumous disease. This is an interesting observation in relation to phthisis, inasmuch as it serves to illustrate, in another point of view, the vicarious activity which the skin assumes in disordered function of the lungs.

NÆVI PILOSI.

Syn. *Spilus. Moles. Nævi Materni. Mother's Marks.*

When it is recollected that every part of the skin, with the exception of the palms of the hands and soles of the feet, is organized for the production of hair, it will cease to be matter of surprise that, under certain circumstances, hair should be found to grow to a remarkable length in unusual situations. The proximate cause of this increased growth is augmented nutrition of the hair-bulbs, determined by local or constitutional conditions, the local conditions being either special organization of the skin or external irritation of that organ. In both, the skin presents a deeper tint than usual, from increased formation of pigment in the cells of the rete mucosum, and a greater thickness from hypertrophy of the hair-bulbs and follicles.

Local increase of length of hair, depending on special organization of the skin, is usually congenital, and is exemplified in the various forms of *pilous nævi*, or *moles*. In nævi of this kind there is no hypertrophy of the capillary structure of the skin, as in vascular nævi, but simple augmentation of color, the consequence of increased activity; and augmentation of thickness, the natural result of enlargement of the hair-follicles and bulbs. Pilous nævi appear in various numbers, and in patches of different size, upon all parts of the body. They are slightly raised above the level of the surrounding skin, and are covered with hair of variable length. Alibert records the case of a young lady, whose skin was studded, over nearly every part of the body, with moles of a deep-black color, from which a long, black, thick, and harsh woolly hair was produced. Villermé, in his article on the Hair, in the *Dictionnaire des Sciences Médicales*, observes, "I saw at Poictiers, in 1808, a poor child between six and eight years of age, that had a great number of mother's marks disposed in brown projecting patches of different dimensions, scattered over various parts of the body, with the exception of the feet and hands. The spots were covered with hair, shorter, and not quite so thick as the bristles of a wild boar, but presenting considerable analogy with them.

[1] Journal Général de Médecine, vol. iv. p. 280.

This hairy covering, with the spots upon which they grew, occupied, perhaps one-fifth of the surface of the body."

Sometimes the disposition to the growth of hair is not confined to so limited a spot as a nævus, but exists over a surface of considerable extent. A few years since, I saw a young lad, about twelve years of age, of healthy aspect and constitution, who presented a most unusual growth of long, harsh, and black hair upon the outer side of the arms, extending from the back of his hands to the shoulders. The integument upon which the hair grew was of a brownish color, and contrasted remarkably with the lighter-colored skin of the rest of his arm, and of the body generally. The contrast was less striking near the circumference of the hairy growth, from the brownish tint terminating imperceptibly in the ordinary color of the cutaneous surface. The skin, in other respects, was uniform with the rest of the integument; it was neither raised nor tumefied, nor did it differ in temperature from the neighboring parts. The hairs in this case were about three-quarters of an inch in length, darker in color than the hair of the head, conical, and differing from the eyelashes in being longer and finer. Examining the skin with a lens, the hair might be seen extending deeply, in an oblique direction, into the integument. On plucking out some of the hairs, and placing them in the field of the microscope, I found them provided with a bulb, and identical in appearance with the hairs of the head, or of the whisker.

Schenkius and Ambrose Paré record instances in which the body was completely covered with hair; and Daniel Turner relates, quoting from Peter Messias, on the authority of Damascenus, "that upon the confines of Pisa, at a place called the Holy Rock, a girl was born all over hairy, from the mother's unhappy ruminating, and often beholding the picture of St. John the Baptist, hanging by her bedside, drawn in his hairy vesture."

Bichat, in his treatise on General Anatomy, remarks, that hairs are occasionally developed on the surface of mucous membranes, as in the bladder, stomach, and intestines; he also discovered them on the surface of renal calculi. In the gall-bladder he once found about a dozen hairs, evidently implanted by the roots in the tissue of the mucous membrane. Villermé states, that hairs have been found on the tongue, pharynx, in the rectum, uterus, and vagina, growing from the mucous membrane.

Local increase of length of hair, depending on external irritation of the skin, is illustrated in the following cases: In a little girl recovering from an attack of fever, a considerable growth of hair took place on the site of a blister which had been applied to the nape of the neck. The hair in this case increased to the length of half an inch, but evinced no disposition to grow longer; it was nearly as dark in color as that of the head, was harsh, but smooth, and thickly planted in the skin. Rayer records a parallel case; and Boyer was wont, in his lectures, to speak of a man who suffered from an inflamed tumor in the thigh, which subsequently became covered with numerous long hairs. Rayer mentions another case, occurring in a medical student, who had several hairy patches on the skin, induced, appa-

rently, by frequent bathing in the summer season, and exposure to the scorching rays of the sun.

Augmented growth of hair in abnormal situations, arising from *constitutional* conditions, is illustrated in numerous instances which have from time to time been recorded. In some of these the unusual growth appears to result from general disorder of the system; in others it is the consequence of a particular modification of the economy. Of the former kind is the case of a young lady, narrated by Ollivier:[1] she was remarkable for the whiteness of her skin, and for a fine head of jet-black hair; while recovering her strength after the effects of a chronic gastro-enteritis, she perceived one day that the entire surface of her skin, both on the trunk and extremities, was raised into small pimples, resembling those produced by cold, and commonly called *goose-skin*. At the end of a few days the pimples presented a small black head, and shortly after they were found surmounted by a short hair, which grew very rapidly; so that at the end of a month every part of the body, with the exception of her face, the palms of the hands and soles of the feet, was covered with a short hairy coat. The individual hairs reached the length of an inch, and were closely planted.

Hair is sometimes developed to a considerable length on the upper lip and chin of women at different periods of age. It occurs most frequently in those possessed of a naturally strong growth of hair, and of a dark complexion. In young women it is frequently associated with disturbed menstrual function. This fact is observed by Hippocrates; but I have seen several instances in which no such disturbance existed, where the vital functions were well performed, and where the subjects were remarkable for robust health. The development of hair upon the upper lip and upon the chin is more common in unmarried females of a certain age, in whom, from inaction, the ovaries have become atrophied; it is also observed in sterile married women. In both these cases other changes, evincing the deprivation of the peculiar characteristics of the sex, are observed, such as dwindling of the mammæ, absorption of the subcutaneous adipose tissue, harshness of voice, masculinity of deportment and of action. A similar condition is remarked in women who have ceased to menstruate, either from natural or pathological causes. John Hunter, alluding to the circumstance of female birds, after having ceased to breed, assuming the plumage and other attributes of the male, says, "We find something similar taking place even in the human species, for that increase of hair observable on the faces of many women in advanced life is an approach towards the beard, which is one of the most distinguishing secondary properties of man." "The female, at a much later time of life, when the powers of propagation cease, loses many of her peculiar properties, and may be said, except from mere structure of parts, to be of no sex, even receding from the original character of the animal, and approaching in appearance towards the male, or perhaps more properly, towards the hermaphrodite."

[1] Dictionnaire de Médecine, article Poil.

TREATMENT.—Where the growth of hair has become a deformity, which the patient is desirous of having removed, several modes of local treatment may be adopted. If its seat be isolated and small, as on a pilous nævus, the best treatment is excision, which, when carefully performed in the direction of the natural furrows of the skin, scarcely leaves any trace of cicatrix. Another mode of getting rid of hair is by means of the ciliary forceps or tweezers. Their complete eradication will, however, be found difficult; for the formative organ still remains, and the hairs are constantly reproduced. A third mode of removing hair is by *depilatories;* these are powders composed of quick-lime, subcarbonate of soda, or potash, and sulphuret of arsenic. They are applied in the form of a paste, and washed off as soon as dry; they act by desiccating and dissolving the hair, and require to be employed with caution, on account of their irritating nature. Depilatories are merely temporary removers of the hair; for it is clear that their agency can extend no deeper than the epidermis; the hair-bulbs consequently remain, and the hair is not long in being reproduced. I have seen deep and troublesome ulcerations produced by the incautious use of depilatories.

II. DIMINISHED FORMATION OF HAIR.

Diminished quantity of hair, from diminished or arrested formation, presents itself in various degrees, of which, simple thinning of the hair, *defluvium capillorum*, may be taken as the earliest stage, and complete baldness or *alopecia* as the last.

DEFLUVIUM CAPILLORUM.

Syn. *Athrix simplex*, Mason Good. *Xerasia. Die Dünnhaarigkeit.*

Defluvium capillorum, the simple and progressive fall of the hair, giving rise to thinness, is an affection of the general surface of the scalp, but more conspicuous at the partings and more obvious in woman than in man from the manner of wearing the hair. Defluvium capillorum, in a small degree, is the common physiological phenomenon occurring once in the year, generally in the autumn season, and corresponding with the change of coat in quadrupeds, and the moult of birds, but is less observable in man than among animals. At other times it is occasional and accidental, being dependent on some change in the functions or health of the individual, and most complete and serious where the general health has undergone deterioration. The change is often rapid; in the course of a few weeks an abundant head of hair may be transformed into a thin and scanty thatch, barely sufficient to hide the white skin from which it grows. If the scalp be carefully examined in these cases it will be found to present various morbid characters; sometimes the skin is dry, scurfy, and hot, and exhales an unpleasant odor; sometimes it is polished, and has the aspect of being relaxed, the pores are large and dilated; and at other times there may be extensive concretions of desiccated sebaceous substance. The hair also exhibits a variety of appearances,

of which the chief is a dry and parched look, and a degree of roughness, resulting from the admixture of hair of every length; this roughness and unevenness being partly the result of the broken state of the hair, and partly of irregular reproduction, some of the young hairs being moderately thick, but the greater part fine and silky, with very little hold on the skin.

In defluvium capillorum the hair is sometimes combed out in prodigious quantities, and if the roots be examined they will be found thinner than the shaft, showing the effects of exhausted nutrition, and, not unfrequently, the root is embraced by a small mass of hardened sebaceous substance. The exhaustion of the follicle continues for a long time after the fall of the hair, making no effort to reproduce it, and when at last the effort is made, the resulting hair is either too thin to maintain its position, or is twisted and crinkled, giving rise to the expression *withered hair;* or it is thick, harsh, and stumpy, its powers of growth being expended in bulk instead of in length.

In the *treatment* of defluvium capillorum, it is necessary to adapt our remedies to the state of the skin as now described: when the proximate cause of the fall is an erythematous state of the hair-follicles, we must prescribe a cooling wash, gentle brushing, and probably an abstinence from grease. When the pathological state is want of tone and vigor in the skin, plentiful brushing becomes desirable; a more or less stimulating wash; and a stimulant pomatum.[1] But while these medical means are being pursued, it is necessary to treat the hair surgically; the short hairs, the growing hairs, the broken and the withered hairs must all be cut, and the operation should be performed once a month, until the weak hairs have grown to a normal and uniform length. There is considerable art in this operation, the separate hairs require different degrees of cutting; some to be clipped down to the level of the skin; others to have the whole of the twisted or withered part removed; and others again to be simply tipped. This method of cutting was first brought to my notice some years back by a hairdresser of Cheltenham, WILLIAMS, and I have been much gratified by observing its success; as a mere physiological experiment it is curious and extraordinary to note how much the human hair may be improved in appearance and growth by so simple a process:

> "There are more things in heaven and earth, Horatio,
> Than are dreamt of in your philosophy."

ALOPECIA.

Alopecia, or baldness, results from defective development or atrophy of the formative organ of the hair, and occasionally from disturbed circulation in that structure. Sometimes the baldness is *congenital;* at other times it is *accidental*, appearing after the full growth of the

[1] Forms of these applications will be found among the "selected formulæ" at the end of the volume.

hair, and causing its fall to a greater or less extent; and again, it may be the *natural* consequence of age, *calvities*. Under these three heads, therefore, I propose to consider the phenomena presented by the defective state of formation of the hair.

CONGENITAL ALOPECIA.

Congenital baldness is sometimes, but very rarely, observed in newly-born infants, in whom, though well formed and healthy with regard to every other function, the hair has been retarded in its appearance until the end of the first year, and sometimes as late as the second and third year. I have seen only a few instances of congenital absence of the hair of the head, but I have met with cases of deficiency in other regions more frequently, as upon the chin and pubes. "Congenital absence, and ulterior defective development of the hair," says Rayer, "are phenomena of considerable rarity, which I have, nevertheless, had opportunities of observing. Such was the case of the man Beauvais, who was a patient in the Hôpital de la Charité, in 1827. The skin of this man's cranium appeared completely naked; although, on examining it narrowly, it was found to be beset with a quantity of very fine, white, and silky hair, similar to the down that covers the scalp of infants; here and there, upon the temples, there were a few black specks, occasioned by the stumps of several hairs which the patient had shaved off. The eyebrows were merely indicated by a few fine and very short hairs; the free edges of the eyelids were without cilia, but the bulb of each of these was indicated by a small whitish point; the beard was so thin and weak, that Beauvais only clipped it off every three weeks; a few straggling hairs were observed on the breast and pubic region, as in young people on the approach of puberty; there were scarcely any under the axillæ; they were rather more abundant on the inner parts of the legs; the voice had the pitch and intonation of that of a full-grown and well-constituted man. Beauvais is not deficient in the virile indications of his sex; he has had syphilis twice. He tells us that his mother and both his sisters had fine heads of hair; whilst his father presented the same defect in the commodity of hair which he does himself."

ACCIDENTAL ALOPECIA.

Syn. *Porrigo decalvans. Alopecia areata; circumscripta. Area. Area diffluens; serpens. Tyria. Ophiasis.*

Accidental baldness is a more common affection than congenital deficiency of development of hair. I have seen numerous instances, in which the baldness has been *general* and nearly complete upon the scalp, one or two small islets of hair-bearing integument alone remaining, while the hair of the eyebrows, whiskers, and beard, was totally lost. In one of these cases the scalp was smooth and polished, thinner than natural, and somewhat stretched over the cranium, giving the idea of an abnormal increase in the convexity of the bones of the head. There was, however, no such condition present. When ex-

amined closely, the scalp was seen to be studded with numerous, superficial, minute, dusky points, the almost obliterated hair-follicles. In the course of a few months from this time, with appropriate treatment, the tenseness, thinness, and polish of the scalp became diminished; the follicles could be seen extending to a greater depth into the scalp; and the mouth of each follicle became the seat of a small pimply elevation of the epidermis. This I regard as the commencement of the second and restorative stage of the disease; the entire surface at this period has the appearance of the cutis anserina, and, in the course of a few days, a minute downy hair may be seen extending from the apex of each little projection. This stage of the case is frequently accompanied with an itching sensation, produced by the imprisonment of the hair within its follicle, the aperture being partially closed by the corrugated edge of the epidermis, and frequently by a minute operculum formed by the hardened secretion of the follicle. The operculum is rubbed off in the attempts of the patient to relieve this itching by friction or scratching, and the downy hair, before invisible, becomes apparent. The newly-formed hair is for some time thin, dry, and slender, and lighter in color than the natural hair, but after a time it gains its proper thickness and hue.

Instead of affecting the entire head, the hair sometimes falls off, without any premonitory symptoms, to a limited and circumscribed extent only (*partial accidental alopecia*), leaving one or more round patches on the scalp, of which the surface is smooth, white, and depressed. Examining the skin at this part, it is evident that the hair-follicles are either very much diminished in size, or in many instances entirely gone, particularly towards the centre of the patch, in which situation the scalp is obviously thinner than nearer the circumference. This, like general accidental alopecia of the scalp, is clearly an atrophy of the hair-follicles, and has had various names assigned to it by different authors. From presenting a regularly circumscribed disk of baldness, surrounded by long and unaffected hair, it has been named "*alopecia circumscripta*," and "*area*." When several of the patches run into each other, so as to present a serpentine figure, it has been called "*ophiasis;*" but its more common designation is that which it received from Willan, "*porrigo decalvans;*" this latter term being intended to ally it with common ringworm.

CALVITIES.

Syn. *Athrix calvities*, Mason Good. *Senile baldness. Der Kahlkopf.*

Alopecia, the natural consequence of age, is a change taking place gradually in the follicles, by which the formative structure, from exhausted nutrition, becomes atrophied, and the follicles obliterated. The change is usually preceded by dryness, and loss of color of the hair. But baldness of this kind is not necessarily confined to old persons; it is daily observed at an earlier period of life, as at forty, thirty, and sometimes in persons still younger. Occasionally it results from mental anxieties and severe afflictions; but at other times comes on without apparent exciting cause.

In association with the baldness of age, it is interesting to note that alopecia occurs on the vertex of the head, in the situation in which the integument is bound down somewhat tightly upon the bones of the cranium, and where the circulation is least abundant and most likely to be interfered with. We frequently see it limited on each side by a line which corresponds with the parietal ridges, and posteriorly by the upper margin of the posterior portion of the occipito-frontalis muscle, while below this line, over the temporal muscle at each side, and over the occipito-frontalis muscle behind, the hair still remains comparatively unaffected. It is obvious that in this case the cause of the baldness must be sought for in an impediment to circulation through the textures of the scalp of the upper part of the head; and in correspondence with this inference, we remark the exceeding paleness of the cranial region. But the same cause may be supposed to have existed also in women, unless we admit that a larger quantity of adipose tissue situated beneath the integument of the scalp, may afford more easy and unimpeded transit for the minute vessels to the capillary plexus of the derma.

I am the more induced to suppose that this may be the case, from observing the infrequency of baldness on the pubes, where a thick cushion of fat is interposed between the hard parts and the surface, and the vessels are enabled to make their passage through a soft and yielding medium to their distribution in the papillary layer of the skin.

The integument of the scalp of old persons who have been bald for some time, is remarkable for its extreme smoothness. Bichat observes, that he examined the scalp of several bald heads by dissection, and he invariably found that the internal surface of the integument, when raised from the fat and superficial fascia, was remarkably even. There was no trace of the numberless appendages constituting the follicles of the hairs which are found in the hairy scalp. On the contrary, in a man recently bald from typhus fever, the follicles were distinctly apparent, and contained each a minute, colorless, down-like hair, the rudiment of a fresh growth. Hence, he continues, there is this important difference between the baldness of the aged and that which succeeds disease; that in the first, the whole of the secreting structure dies, or becomes atrophied, from the cessation of circulation in the vessels of the part; whereas, in the latter, the hair alone falls, while the follicle remains behind.

Bichat also remarked, that the follicles of the hair, when seen from the exterior, appear to become more and more shallow, until at last they reach the surface, and are obliterated completely. The same change may be observed on the surface of tumors forming in the scalp. The integument becomes gradually thinned, the hair-follicles becoming more and more shallow, until every trace of them has disappeared, and the hairs which they once contained fall off.

CAUSES.—The proximate causes of baldness have been already stated; they are, defective development of the formative organ, defective circulation in the formative organ, and defective nutrition of the formative organ. The remote causes are, hereditary peculiarity,

the termination of acute diseases, certain diseases of the skin, certain general affections, syphilis, mercury, coffee taken in excess, late hours, extremes in venery, old age. The fall of the hair which occurs during convalescence from fevers and diseases attended with extreme depression of the vital powers, must be ascribed to enfeebled vigor of the system and consequently to defective nutrition of the hair. Lemery[1] mentions the case of a patient, who some months after a violent hypercatharsis, lost the whole of his hair.

The hair may suffer from any disease in which the activity of the nervous and vascular systems is directed energetically to any one portion of the body to the impoverishment of the rest, as in some local diseases. I have seen nearly the whole of the hair of the scalp lost during the progress of an ordinary pregnancy. In rheumatism and gout, the hair is liable to grow dry, and fall off. The loss of hair is sometimes remarkably exhibited in phthisis,[2] in which disease, not only the hair of the scalp, but also that of the eyebrows and beard is apt to fall. This change is particularly observable in young women possessed of extremely long hair. Instances in which alopecia is attributable to syphilis are not uncommon; mercury, also, when taken for a length of time, is supposed to affect the secreting organs of the body injuriously, and among these, the secreting apparatus of the skin. M. Lagneau, in his article "Alopecia," in the *Dictionnaire de Médecine*, expresses a different opinion, as relates to the operation of mercury. He remarks, that it is erroneous to suppose that persons affected with syphilis are rendered bald by the abuse of mercury, for alopecia has been seen to manifest its presence, occasionally, before the patients have employed this remedy, or any other antisyphilitic medicine whatsoever. On the other hand, he continues, I do not believe that any one ever saw alopecia developed, after the cure of other diseases, by mercury.

Baldness is modified by sex: in the male it is common, but in the female, rare. I am disposed to believe that the difference between the sexes in this respect, lies in the greater proportion of subcutaneous fat existing in the female. The scalp of bald persons is usually thin; and eunuchs, who are generally fat, are remarkable for the length and permanency of their hair.

Gustav Simon ascribes alopecia areata to the destruction of the hair by a vegetable fungus. I am an unbeliever in the doctrine.

Treatment.—The principal indication to be fulfilled in the treatment of baldness, is to stimulate the capillary circulation of the scalp, which is evidently below the natural standard. With this view I am in the habit of recommending the washing of the head every morning with cold water, drying it by friction with a rough towel, brushing it with a hard hairbrush until redness is produced, and then applying some stimulating application, rubbed briskly into the scalp for the space of five minutes. In women whose long hair contraindicates the

[1] Mém. de l'Acad. des Sciences, prem. mem. vol. ii. p. 39.

[2] Hippocrates remarks, "Quibus tabe laborantibus, capilli de capite defluunt, hi, alvi fluxu superveniente, moriuntur."

use of the cold bath, stimulating applications with plentiful brushing must be relied on. From two to four drachms of the unguentum stimulans,[1] combined with an ounce and a half of sweet-scented pomatum, form an elegant and useful compound for procuring the proper amount of stimulation of the scalp in alopecia.

In addition to the trichogenous pomatum, it is sometimes convenient to be in possession of an agreeable stimulating wash for the hair. The wash may be used either alone or alternately with the pomatum. The best trichogenous wash, according to my experience, is the ammoniated spirit wash, of which the composition will be found among the "selected formulæ."

Various stimulating substances have been suggested and used from time to time, in the treatment of alopecia, with advantageous results; such as mustard, horseradish, walnut-leaves, the pomades of Dupuytren and Gibert. The pomatum ascribed to Dupuytren appears to me to be too clumsy a compound to owe its origin to so elevated a source; this remedy, with the trichogenous ointment recommended by Gibert, will be found among the "selected formulæ."

Avicenna recommends the use of leeches, slight scarification or acupuncture in the first instance, followed by rubefacients. The latter were in high favor among the ancients, who have left a goodly list of them in their writings: the following are some of the principal: oils of chamomile, wormwood, bay, laurel, and dill; hellebore, euphorbia, pomegranate, nasturtium, stavesacre, fœnugreek, rosemary, sage, Peruvian balsam, tar, frankincense, mastich, myrrh, and laudanum. Laudanum is warmly praised by Dioscorides and Galen, and occupies a place in most of the local applications for baldness.

It would not, however, in all cases, be judicious to limit the treatment of baldness to external remedies. Where disturbance of the secretive and digestive functions is present, these require attention. Where the energies of the nervous system are obviously reduced below their natural level, steel medicines and tonics may be used with advantage.

My practice in area, after regulating the secretions, and, if necessary, administering ordinary digestive tonics, is to prescribe my ferro-arsenical mixture internally; and the use locally of some moderately stimulating pomatum, liniment, or lotion, such as the diluted pomatum stimulans, an ammoniacal liniment, or a lotion of acetum cantharidis. With these remedies the cure is simply a question of time; the result cannot be otherwise than successful.

When the hair begins to grow after baldness, it is at first of a light color, dry, soft, and almost downy, like the young hair of a newly-born child; but, by degrees, under favorable circumstances, it resumes the color and strength of the surrounding hair. At other times, this colorless hair remains during life, and forms a remarkable contrast with the dark hair of the rest of the head. The restoration of the hair to its primitive strength is said to be favored by shaving the scalp, the object of this operation being to confine the nutritive fluids

[1] Vide "selected formulæ" at the end of the volume.

to the formative structure, until it shall have regained sufficient power to produce hair of a proper degree of size and strength. Many authors concur in the advantage of shaving as a means of strengthening the hair. Fallopius upon this subject observes, "Il y a quarante ans que nous portons la barbe longue, en signe de notre déshonneur et de notre servitude; avant cette epoque nous nous rasions et nos poils ne tombaient pas. Les Espagnols en envahissant l'Italie, y ont introduit la tyrannie, la verole, et l'usage de la barbe longue."

III. ABNORMAL DIRECTION OF THE HAIR.

Under the head of abnormal direction of the hair, may be assembled two instances of irregularity in its growth and arrangement, not referable to the preceding groups. They are,

Trichiasis ciliorum,
Trichiasis coacta.

TRICHIASIS CILIORUM.

Trichiasis ciliorum is an irregularity in the growth and direction of the eyelashes. The cilia in this disorder grow inwards towards the surface of the eyeball, and, rubbing against the conjunctiva, give rise to chronic inflammation of that membrane.

The treatment of trichiasis ciliorum consists in removing the misdirected lashes by means of the ciliary forceps, and preventing their future growth by the application of nitrate of silver.

TRICHIASIS COACTA.

Felting of the hair.

Felting is a derangement of the hair arising from neglect, and has no claim to consideration as a disease. It consists merely in a state of inextricable interlacement, best expressed in its name. Felting of the hair is rarely met with, and when it exists, is seen in women, whose long hair affords the only excuse for such a state of disorder. It has been observed after childbed, and in cases of extreme distress.

IV. ALTERATION OF COLOR OF THE HAIR.

Alteration of the color of the hair arises from disorder of the chromatogenous function of the formative organ, and is very commonly associated with a similar alteration of the rete mucosum of the skin. It is by no means rare to find a lock of hair different in color, *trichosis decolor*, from that which surrounds it. Less frequently, sudden alterations of color have been observed, while blanching of the hair, or canities, *trichosis cana*, is the natural effect of the torpor of function which accompanies advancing age.

TRICHOSIS DECOLOR.

Two instances of reproduction of hair of different color to the original, after recovery from severe illness, are recorded by Alibert;

in one of these, a head of bright red hair replaced one of dark brown, and in the other, hair of a deep black color took the place of brown. In the case of baldness from hypercatharsis, mentioned in a preceding page, the hair, originally of a brown color, was reproduced fair; and gray hair has been known to fall off in advanced age, and a new crop, similar in color to that possessed in youth, to be substituted.

Dr. Isoard, in a paper entitled, "Observation relative à une famille dont chaque individu presente plusieurs anomalies remarquables," in the *Journal Complementaire du Dictionnaire des Sciences Médicales*, amongst other extraordinary physiological and pathological anomalies observed in the members of this family, remarks, that one of the daughters, seventeen years of age, and deaf and dumb from birth, each time that she is attacked by a fever peculiar to her constitution, undergoes a change in the color of her hair, from a pleasing blond to a dusky red, but that as soon as the febrile symptoms diminish, the natural color is restored. In the second volume of the *Memoirs of the French Academy of Sciences*, is the narrative of a case in which the hair of a female was changed from brown to fair during her confinement, which otherwise presented no remarkable feature. M. Villermé[1] relates the case of a young lady, thirteen years of age, who, never having suffered from any more serious illness than slight pains in the head, perceived, during the winter of 1817–18, her hair fall off in several situations, until, at the end of six months, there was not a single hair remaining. In January, 1819, the scalp began to show a new growth, of a black-colored wool, in the situations first affected, and of brown hair over the rest of the head. The wool and the brown hair became white, and partly fell off after they had reached the length of three or four inches, while the rest changed their tint at a certain distance from the point, and became chestnut-colored for the rest of their extent towards the root. The hair had a singular appearance, half white and half chestnut. The specimens sent to the Society were mingled with a number of short hairs entirely chestnut-colored. In remarking on the preceding case, M. Villermé observes, that he has more than once seen the hair, particularly in phthisical patients, after having become white and fallen off, succeeded by a crop of new hair of a darker color even than the original hair of the patient. The late Dr. Chaumenton presented this phenomenon in a marked degree.

Dr. Bruley, of Fontainebleau, communicated to the Society of Medicine in Paris, in the year 1798, the history of a woman, sixty-six years of age, named Castellane, whose hair, naturally white and transparent as glass, became jet-black four days before her death. She died of phthisis. Some of this hair was transmitted to the Society, and was found to be quite black, with a few white hairs interspersed. On examination after death, Dr. Bruley found the bulbs of the black hair of large size, and gorged with dark pigment. The roots of the white hairs were dried up, and two-thirds smaller in size than those of the black hair. In his comments on this case,

[1] Journal Générale de Médecine, vol. lxix. p. 213.

Dr. Bruley observes: "It is certain that disease may give rise to a change in a short period, that, according to Haller, requires a long period to accomplish naturally."

TRICHOSIS CANA.

Syn. *Canities.* *Trichosis poliosis*, Mason Good. *Der Graukopf.* *Blanching of the hair.*

Under the term trichosis cana, or canities, I propose to describe whiteness of the hair, whether its production be congenital, or dependent on age, disease, or other causes. Dr. Copland regards the term as applicable only to whiteness resulting from an abnormal cause; hence he defines it, "hairs prematurely gray, hoary, or white." Canities presents two varieties in *degree;* in the one the hair is "snowy," of an opaque white, and corresponds in thickness with ordinary hair; in the other it is clear and transparent, the "silvery hair" of age, assuming a yellowish tint on desiccation by the atmosphere, and not unfrequently finer than ordinary hair. These two kinds of hair offer remarkable chemical differences; the former containing an abundance of calcareous salts, and the latter a much smaller quantity, or even none.

Canities may be of three kinds: congenital, accidental, or senile; it may also be, in either of the three groups, partial or general.

CONGENITAL CANITIES of the hair is usually partial; I have seen two examples in young children where the phenomenon presented itself in the form of round patches; both were of the snow-white kind. In the one, the patch was situated on the side of the head; while in the other, it occupied one side of the forehead. The skin upon which the hair grew was remarkable for its whiteness, and contrasted strongly with the neighboring integument. Bartholin saw an infant, the whole of whose hair on one side of the head was brilliantly white, while the opposite side was equally remarkable for its jetty blackness. Ridlinus and others have seen the entire head of young persons uniformly white, although different in appearance from that of old age, and approaching very slightly the tint of fair hair. I have before alluded to the whiteness of the hair of Albinoes, both of the European and African race. Rayer, in the Atlas accompanying his work on diseases of the skin, gives a delineation, copied from a picture in the museum of the Jardin du Roi, of a young negro, upon the middle of whose forehead, and rising from the root of the nose so as to include a moderately large patch of hair of the front of the head, is a broad tract of skin wholly deprived of pigment; the hair is perfectly white, and the white band on the forehead rendered the more striking, by presenting a roundish islet of deep black near its middle. On the same plate is a figure, representing the head of an Albino negress, copied from Buffon; the skin of the face and the wool upon the head are entirely and completely white. Schenkius details the case of a young man, whose beard grew white on its first appearance.

ACCIDENTAL CANITIES and SENILE CANITIES present varieties in *ex-*

tent: sometimes the whiteness is partial, being intermingled with the ordinary hair over the entire head, and producing, according to its proportion, the relative shades of gray. At other times it is local, and confined to one or several spots, constituting so many distinct patches; or it may be general, and involve the entire head of hair. It commences generally upon the temples, and thence spreads gradually over the rest of the head. Blanching of the hair occurs first upon the head; it proceeds, in the next place, to the hair of the face, and subsequently attacks the pilous covering of other parts of the body. When white hair falls off it is not reproduced, but the scalp beneath remains bald. In Europe canities would appear to be equally common in the male and in the female, but attacks the latter at a later period of life, unless induced by other causes than age. "In China," says Mr. Lay, "the women turn gray sooner than the men; the former are often bald, the latter seldom."

Blanching of the hair commences at the root, and the colored part is gradually carried onwards, further and further from the integument. It is curious to see the hair undergoing this change, parti-colored in appearance, and reminding us of the ringed hair of the gray cat and ichneumon. The kinds of hair most liable to the invasion of whiteness are those of a dark color, as black and brown; fair and auburn hair rarely become gray, but are more liable to fall off.

I have at present under my care a little girl, not yet six years of age, in whom there is an abundance of white hair mingled with that of her natural color, brown; and there are besides many of those short, bent, and horny white hairs, which are common in advanced age. She is a pale, thin, and excitable child; and has a superadded cause of nervous exhaustion in a large clitoris. At her birth she possessed an abundance of black hair, which, although retaining its quantity, has gradually altered to a rich brown; her eyebrows and eyelashes are still black. About twelve months back she received a shock to her nervous system from an accident; and some weeks afterwards her hair was found to have changed to white in parts of the head. It began in three circular patches, and has gradually increased until the head has quite the appearance of that of an elderly person. There is besides some tenderness of the head, and a furfuraceous desquamation. The change of color of the hair in this little girl is evidently a neuropathic phenomenon.

CAUSES.—Congenital canities depends upon some constitutional peculiarity inherent in the organization of the individual. Senile canities is the consequence of diminished powers of the cutaneous nervous system, as evinced, either by the alteration of the pigment deposited in the formative cells of the hair, or by the entire absence of the coloring principle.

The remote causes which have been observed to give rise to accidental canities are, mental emotion, physical suffering and privation, constitutional affections, disease, and injuries. Of mental emotion, as of grief, anxiety, fear, terror, anger, acting as exciting causes of blanching of the hair, there are numerous recorded instances. In some of

these cases, the effects were gradual, in others immediate, producing the silvery tints of age in the course of a few hours.

"The different passions of the mind," says Bichat, "have a remarkable influence over the internal structure of the hair; often, in a short period, grief effects changes in its color, blanching the hair probably by means of absorption of the fluids contained in its tissue. Many authors have recorded similar facts. Some, and Haller among the rest, have doubted the truth of these assertions, but I know at least five or six examples, in which the loss of color was completed in less than eight days. In a single night, a person of my acquaintance became almost entirely blanched, on receiving some distressing news."

The hair of Marie Antoinette, the wife of Louis XVI., is said to have become gray in a short period, from grief. The same statement is recorded with regard to Mary Queen of Scots. It is affirmed that Sir Thomas More became gray during the night preceding his execution. Borellus asserts that two gentlemen, one a native of Languedoc, the other a Spaniard, were so violently affected, the first by the announcement of his condemnation to death, the latter by the bare thought of having incurred a serious punishment, that both became blanched in the course of a single night. Borellus adds, with regard to the latter gentleman, that his hair regained its natural color on being set at liberty. Schenkius and Boyle relate similar instances, but without the subsequent restoration. Hermeman also records an instance of sudden loss of color of the hair.

Dr. Cassan, in a paper in the *Archives Générales de Médecine*, before referred to, records the example of a woman, thirty-three years of age, who, on being summoned before the Chamber of Peers to give evidence upon the trial of Louvel, underwent so powerful a revulsion, that in the course of one night the hair was completely blanched, and a furfuraceous eruption appeared all over her head, on her chest, and on her back. After the disappearance of the eruption, the hair still maintained its abnormal color.

Henry III., of Navarre, on hearing that the edict of Nemours was conceded, a condition favorable to the supporters of the League, was so exceedingly grieved, that in the course of a few hours a part of one of his mustachios whitened. In a person referred to by Rayer, several of the cilia became blanched, accompanied with white spots over the arms and forearms, in consequence of mental agitation.

M. Moreau[1] observes, "I once knew an aged man, for whom snow-white hair and a countenance deeply marked by the furrows of care, inspired the respect which we owe to age and misfortune." "My hair," said he, "was as thou seest it now long before the latter season of my life. More energetic in their effects than assiduous toil and lingering years, grief and despair at the loss of a wife most tenderly loved, whitened my locks in a single night. I was not thirty years of age. Judge, then, the force of my sufferings; I still bear them in frightful remembrance."

[1] Journal Générale de Médecine, vol. iv., p. 280.

The poets make frequent reference to this remarkable and sudden effect of violent mental emotion:

"O nox! quam longa es, quæ facis una senem!"

Byron, in the "Prisoner of Chillon," refers to the same phenomenon:

"My hair is gray, but not with years,
Nor grew it white,
In a single night,
As men's have grown from sudden fears."

I have myself seen several undoubted instances of blanching of the hair within the space of a few hours; and have recorded some in my treatise on HEALTHY SKIN; and my researches into this subject, started in a skeptical spirit, and with doubt as to the possibility of such an occurrence, have resulted in a conviction that sudden blanching of the hair, although rare, is nevertheless an established fact.

After some diseases of the scalp, it sometimes happens that the newly-formed hair remains permanently white; the same change is occasionally observed upon cicatrices left by wounds.

V. DISEASES OF THE HAIR.

Two diseases only come strictly under this denomination, as being characterized by a morbid alteration in the structure of the hair. One is amongst the most common of the diseases of the scalp of this country, namely, ringworm; the other is a disease of Central Europe, and particularly of the marshy districts of Poland, the plica polonica. Much confusion has existed with regard to the former of these affections, in consequence of the variety of names which have been assigned to it, and also from the fact of the generic title comprehending diseases of a totally different character. Moreover, the names themselves are ill chosen, the term "tinea" relating to the condition of the hair at a period when the disease has been in existence for some time; while the term "porrigo" was selected by Willan, only because it had been in use among the ancient classic writers; neither of the terms having any reference to the nature of the disease. Under these circumstances, I consider that a first step to the proper understanding of this affection, and the removal of existing difficulties, might be made by adopting for its designation the term *trichonosis*, or *trichosis*.[1] I am further induced to give a preference to this term by finding it to coincide with what I believe to be the true pathological nature of the disease, namely, a morbid action producing degeneration and destruction of the hairs.

The proper diseases of the hair are, therefore—

Trichosis furfuracea,
Trichosis plica.

[1] Der. θρίξ, capillus; νόσος, morbus.

TRICHOSIS FURFURACEA.

Syn. *Common, or scurfy ringworm. Tinea capitis. Tinea nummularis. Porrigo furfurans. Porrigo scutulata*, Willan. *Porrigo circinata*, Mason 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 (Plates XIV., XV.) is characterized by a dry and furfuraceous state of the skin, occurring in circular or oval patches of variable size. The patches are slightly elevated, papillated,[1] 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-gray 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 latter period, the patches are left more or less bald, but never completely so as in alopecia areata.

In the early attack of common ringworm, the only appearance of disorder that can be detected is 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 with a slight degree of itching, which is relieved as soon as the scurf is torn away by the nails or removed by the 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 color, 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

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

at the mouths of the follicles; this is the first effort of a restorative process.

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 grayish and yellowish in color, 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 referable to eczema, another while they diverge 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 color, 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 forms 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 unattended with discharge of any kind, and sometimes this absence of secretion is conspicuous throughout its entire existence. At other times, 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 with considerable itching, 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, 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 or farinaceous 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 be 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, or even a third ring.

I have observed this form of ringworm on the neck or arms of adult females who have tended children suffering from trichosis furfuracea; but as frequently on others who have had no such association.

PATHOLOGY.—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, discolored, 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 or cuticle, which forms the surface; a fibrous portion, which constitutes the chief bulk of the hair; and a central medullary portion or pith. In the diseased hair, the cortical portion is little altered from its normal condition, but 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 colorless 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 granules 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 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.

In essential nature, the morbid alteration now described is a modification of the normal structure of the hair and epidermal lining of the hair-follicles. In a preceding page (58), 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. 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 as 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. Malmsten,[1] of Stockholm, seems to adopt[2] 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 is to me impossible to comprehend.

CAUSE.—Common ringworm 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,[3] 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 porrigo; these cases yielded, like others, to the 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 of grade 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 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

[1] Trichophyton Tonsurans, Harskarande mogel. Stockholm, 1845.

[2] 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.

[3] Remarks on Cutaneous Diseases. By J. H. Wilkinson, 1822.

is the 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 frequent cause of ringworm. Confined in ill-ventilated rooms, congregated in considerable numbers, bending their little minds to distasteful labor, 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 matter of surprise that the nutritive functions of the body should suffer, and that derangement of one of the simpler processes 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 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 favor 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, in the management of children, may be deduced from this observation.

In reference to a case already mentioned, 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 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.

But it must be remembered always, that ringworm is undoubtedly epidemic, and may be endemic; and this fact will serve to explain much that has heretofore been attributed to the action of contagion. In my medical practice I often pass many weeks without seeing an instance of ringworm; suddenly a case comes before me, and then I know that I shall have a succession of such cases, not from one locality, but from many; an epidemic has begun and will continue for some weeks. In this way an epidemic seizes upon a school, and its progress is regarded as a proof of contagion; I can only see in it a morbific atmosphere operating on constitutions predisposed to such disorder, in consequence of unhealthy nutrition. A curious evidence of the epidemic nature of ringworm came before me accidentally a short time back. A brother and sister, of ten or twelve years of age, were both seized with ringworm at the same time, the one being in Cornwall, the other in Essex; they had had no communication with each other for twelve months. An epidemic of ringworm was then prevailing; but had these children been together within three months of the attack, every old woman in the empire would have exclaimed "contagion!" and commenced speculating upon the probable period of latency of the poison; or, according to the modern trichophytic heresy, upon the length of time that the sporules of the trichophyton maintain their vitality and their aptitude for germination.

TREATMENT.—The indications for the treatment of common ringworm are, *firstly*, to restore the defective powers of the constitution; and, *secondly*, to restore the local power of the skin. These objects are to be fulfilled by similar means; the first indication calling for improved hygienic conditions, improved diet, and 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 change of air, 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 laboring under this complaint; for combining, in fact, physical education with mental education, and the advantages of sanitary 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 better adapted for their cure. Nevertheless, it is painful to reflect that this isolation is generally accompanied with a 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 exclusively vegetable or milk diet, and these are circumstances to be borne in mind in regulating the regimen of our patients. I should give a preference to a sound animal diet, with a good beer, such as brewer's porter,[1] for drink, and chocolate, cocoa, and tea, in small quantity, for the morning and after-dinner meal. Butter I look upon as highly useful. With a sound diet and normal assimilative power there can be no ringworm.

The medicines which are best adapted for the disease are the 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, there is none better than the confection of senna with sulphur and cream of tartar. If there be enlargement of lymphatic glands, having a scrofulous origin, the oleum jecoris

[1] In contradistinction to publican's porter.

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, with the moist compress and oiled silk, or by means of a piece of Alison's prepared corium.

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 favor with housewives on account of its color: the substitute, a lighter-colored soap, is, however, very inferior. Soft soap has been much in use for washing heads affected with ringworm, but is offensive and disagreeable, and in nowise superior to the soda-soaps; indeed, I regard it as inferior to the common yellow soap.

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

A remedy which I have found 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 florium sambuci, or unguentum cetacei. The iodide of sulphur ointment, which I have frequently used, I find inferior to the above remedies.

As the principle of local management of this complaint is cleanli-

ness 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 odor, is a sulphur and tar ointment,[1] originally suggested, I believe, by Dr. Wilkinson.

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, an ointment of oleum laurini, sulphur and camphor. Other remedies, which have been from time to time in vogue, are, sulphur ointment and soft soap, equal parts; the unguentum sabinæ; and spirits of turpentine; adhesive plaster has also come in for its share of praise.

Plumbe was in the habit 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 his reputation.

Ointments 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 (℥j ad Oj); sulphate of zinc, in rose-water (℥ss—℥ij ad Oj); or bichloride of mercury, in emulsion of bitter almonds (gr. x ad Oss); 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 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; or, where dipping the head in cold water may be objectionable, the scalp should be sponged every morning, while brushing, with the lotion of borax and almond oil.

[1] Vide "Selected Prescriptions."

TRICHOSIS PLICA.

Plica polonica, or Polish ringworm.

Plica polonica, so far as I am able to judge from the description of the disease given by authors, is, in 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 its analogue also 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-colored 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 their extreme sensibility, has given rise to the supposition of the hairs being sarcofied, and pervaded with vessels and nerves. The odor arising from a scalp so affected is described as being exceedingly disgusting; excoriations of considerable extent are frequently formed, and the matted hair becomes the resort of swarms of 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 discolored. 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, *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,[1] 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 imbedded.

"I had also 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. 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."

Causes.—Supposing my opinion to be correct with regard to the nature of plica polonica, 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[2] and the wealthy, as well as in the poor; and, unlike ringworm, it occurs in adults as well as in children.

Treatment.—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, particularly the ferro-arsenical remedies. A prejudice seems to prevail in Poland against the removal of the mass by mechanical means, which I am inclined to think unreasonable. It would be necessary to subdue local inflammation in the first instance, and afterwards apply moderately strong stimulating local remedies.

VI. DISEASES OF THE HAIR-FOLLICLES.

The hair-follicles and hairs are so intimately allied, that it is difficult to understand how disease can be present in one without at the same time involving the other. Practically, this difficulty is solved by the fact that the follicles may be deranged in their function without any alteration being manifested in the structure of the hair. But the

[1] Müller's Archiv., 1840.

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

reverse of this proposition is not equally true; for in that greater morbid change, which is the cause of alteration in the structure of the hair, the follicles suffer to a greater or less extent. Hence, while the designation "diseases of the hair-follicles" must be regarded as applying solely to those organs, "diseases of the hairs" may be supposed to implicate the follicles also.

Disease of the hair-follicles manifests itself either as a *simple erythema* or chronic inflammation; as an erythema attended with excessive formation and alteration of secretion, constituting *stearrhœa folliculorum;* as a suppurative inflammation of the follicles of the scalp, or *scall;* as a suppurative inflammation of the hair-follicles of the face, *sycosis;* and as a chronic inflammation attended with the formation of a peculiar morbid product, namely, *favus*. In a tabular arrangement, they would stand as follows:

Erythema folliculorum,
Stearrhœa folliculorum,
Inflammatio folliculorum suppurans,
Sycosis,
Favus.

ERYTHEMA FOLLICULORUM.

Inflammation of the hair-follicles is indicated by an erythematous blush of redness of the skin, dryness, and the production of a large quantity of furfuraceous scales. There is, besides, considerable itching, and more or less decadence of the hair. This condition of the follicles is not unfrequently the forerunner of a morbid secretion (stearrhœa folliculorum), which is diffused and hardens upon the surface of the scalp. The following is an example of the disease:

A naval medical officer, while serving in the West Indies in 1833, suffered from an attack of erythematous patches on the crown of the head. They were attended with itching, and by a copious furfuraceous desquamation, the itching being much increased at night. In 1837, on his return to England, the disease presented occasional exacerbations, but never at any time disappeared entirely. In 1838, while on the Pacific coast of South America, frequently exposed to a tropical sun, and undergoing considerable fatigue with copious perspirations, the patches coalesced, and poured out "an unctuous exudation of a dark reddish color." At this time, also, the loosening and fall of the hair, which has continued until the present time, was first noticed. "Previous to my return to England in 1839," this gentleman observes, "large sebaceous incrustations covered the crown of the head in patches varying from the size of a sixpence to a shilling; the scales became thicker, attended with an exceedingly disagreeable feeling of heat and itching. They were in a state of continual decadence and renovation. I had my head shaved for two or three months, and while the hair remained short, I was effectually relieved from the disease."

As soon as the hair was allowed to grow, the disease returned, and in 1840, while stationed at the river Plata, he was again shaved, and

continued the practice for four months. In 1841, whilst in China, he had recourse to shaving for the third time. "During our operations," he remarks, "in the Yeang-tse-keang, the heat was most intense, the thermometer ranging from 90° to 95° in the shade. I think the disease, at this time, attained its greatest pitch of intensity, which I am induced to attribute to the impaired state of the digestive functions, as I was confined for months exclusively to the ship, and of course debarred all suitable exercise. The scales at this time assumed a gummy character, tenacious and soft; the itching was particularly annoying, but was somewhat relieved. I passed eighteen months on the East India station without any alteration in the character of the complaint."

"During my stay in England, in the winter of 1844–45, I tried preparations of the nitrate of silver, iodine, dilute hydrocyanic acid, and I persevered in the use of the tincture of iodine, applied locally, during the voyage to Van Diemen's Land last year without any benefit; and during my return I used most assiduously the bichloride of mercury, which relieved the itching for a short time."

"I am unable to account for the commencement of the disease, nor was I, during its progress, sensible that climate produced any material alteration in its character. Heat and itching were the usual concomitants, and they were at times so annoying that I was obliged to apply soap and water frequently during the day, which always afforded me temporary relief. Stimulants always increased the itching.

"A deceased brother was similarly affected, but he never lost his hair, and I am the only one of my family who has felt its decadence, although many of my progenitors have lived to a very old age."

"Notwithstanding the different remedies resorted to, the disease assumed that inveterate form which you saw when I had first the pleasure of consulting you in February last. Since I have been under your treatment, the disease has gradually yielded to the means you have employed. The patches, after your second application, sunk to the level of the surrounding integument, the squamæ have not been reproduced to a hundredth part the extent that they were before, the few remaining patches have gradually lost their hardness and redness, and are now resuming the character of healthy integument. I feel that the hair has been in a slight degree reproduced."

Besides attacking the head, *erythema follicularum* is also met with on the forehead and eyebrows, and on the shoulders and backs of the upper arms. Its characters are a punctated redness with dryness of surface, and a roughness, which is partly due to the prominence of the pores, as in cutis anserina, and partly to the follicles being filled, and, as it were, choked up with dry and harsh epithelial contents. I have commonly observed this disorder in young ladies; it injures the beauty of the skin, and when it attacks the eyebrows (erythema follicularum supercilii) is more serious in its consequences, as it causes the fall of the hair, and produces a papillated baldness more particularly of the outer half of the eyebrow. The absence of the natural sebaceous secretion of the skin, and the production of a dry sordes in its place, exhibits a torpor of function which is at the root of this

complaint. It is best *treated*, locally, by daily ablutions with the juniper tar soap, and with the compound hypochloride of sulphur ointment; and, constitutionally, by general tonics and some of the milder preparations of arsenic.

STEARRHŒA FOLLICULORUM.

Seborrhœa.

In some instances, the inflammation of the follicles is so slight as to escape attention altogether; and the disease does not come under the attention of the surgeon until the altered secretion has been poured out upon the skin, and forms a concretion of variable thickness and extent. To this stage of the complaint I have assigned the name of *stearrhœa folliculorum*. The crust presents some variety in point of color. It is often yellowish, and resembles the film which drying-oil leaves after desiccation, and sometimes is grayish and greenish in its hue. Occasionally, this state of the scalp is associated with dryness of the skin, and then the hair is dusty and sordid; but, more frequently, there is no such appearance.

The symptoms by which the patient discovers the presence of disease are, itching, frequent, often intense, sometimes constant, and fall of the hair.

There is another state of the scalp, *narcosis folliculorum*, depending on chronic inflammation of the hair-follicles, which is far from being uncommon, particularly in women and children. In this disorder, the scalp and hairs are found covered with a yellowish and dirty-looking powder, composed of an admixture of granular particles and furfuraceous scales. Masses of this granular substance are collected at the mouths of the follicles, while others are threaded like beads upon the hairs. By brushing, the skin may be completely cleansed of this pulverulent substance, but the granular particles still remain threaded on the hairs, and adherent to them, at the mouths of the follicles. If a hair be withdrawn, its follicular portion will be seen to be inclosed in a small sheath of desiccated epithelium or sebaceous substance, which extends almost to its root. Moreover, the root is slender and dry, and the entire hair looks parched and starved.

The symptoms which denote the existence of this complaint to the sufferer are, the difficulty of cleansing the hair, a moderate degree of itching, and the fall of the hair, which comes off in large quantity. The fall of the hair is easily explained; the torpidity of action, which gives rise to the production of a dry, sebaceous matter, and a dry and pulverulent epithelium folliculi, extends its influence to the growing hair, which is deprived of its moisture and of its hold upon the skin, and therefore falls before the slightest force. Another change depending on the same cause is not unfrequently observed in this disease, namely, grayness of the hair.

When torpor of the follicles occurs upon the general surface of the body, it interferes, more or less, with the growth of the hairs, and is termed *morbus pilaris*. In this affection, the hairs become imprisoned within the follicles by the formation, at the mouth of the latter, of a

small mass or film of hardened, sebaceous matter; and, as the hairs continue to grow, in spite of this impediment, they are gradually twisted into a spiral coil (Plate VI., fig. 10), which may be seen at the mouths of the follicles. A number of little pimply elevations are in this manner produced, each elevation corresponding with a coiled hair; and if the apex of the pimples be rubbed off, the twisted hair will be at once exposed. This disorder is most frequently perceived on the legs and thighs. Turner remarks, that in children it is often met with on the back. It is attended with itching, and occasionally with acute, lancinating pains, comparable to the piercing of the skin with a sharp needle.

TREATMENT.—The treatment of the three preceding forms of disease consists in the employment of moderately stimulant remedies locally; and for the most part tonic medicines constitutionally. Of course, the common indications of disorder of stomach, kidneys, or uterine function will not be passed over. In the case of the naval surgeon reported above, I found it necessary to modify the action of the skin by blistering the surface occasionally with the acetum cantharidis, and afterwards employing the pomatum stimulans. Indeed, the latter preparation I find invaluable in this class of diseases; it should be sufficiently strong to keep up a moderate action in the skin. Another excellent remedy is the emulsion of ammonia and olive oil. In some instances a stimulating lotion may be preferred to oleaginous remedies, but, in the latter case, the skin must be kept moistened with cold cream or some simple pomatum.

INFLAMMATIO FOLLICULORUM SUPPURANS.

Scalled head.

Scalled head is a disease of young persons, extending in its range of period from childhood to puberty. The first symptom of its attack is a slight itching of the scalp; on the irritable spot a thin whitish crust is produced, and, after the lapse of a few days, rarely longer than a week, the inflamed spot, which is exactly circular, and of a size varying from that of a sixpence to a crown-piece, or even the palm of the hand, is swollen, and tender, and commonly bare, from the sudden and unobserved fall of the hair. The inflamed surface is red, tender, swollen, more or less puffed, and studded over with whitish yellow points, the *achores* of Willan, these yellow points being the mouths of the follicles distended with pus; while the skin between the apertures of the follicles is red and glazed, and resembles the pulp of a ripe strawberry. The scall is remarkable for the suddenness of its appearance, and for the rapidity of its progress; in a few days it is often swollen to the height of three-quarters of an inch; and seems as if infiltrated with pus, of which the follicles are the openings of exit.

The copious exudation of pus from the inflamed skin, not unfrequently produces a matting of the hair over the diseased surface; and disguises the morbid action taking place in the skin; and the morbid structure is so tender as to render the removal of this matted coating an operation of some difficulty. The inflammation sometimes extends to the surrounding skin; and the occipital, and auricular, and even

the cervical lymphatic glands, become tender and inflamed, and often suppurate. When the scall is of large size it may be solitary; but usually there are several dispersed over the head.

When the suppurative action is on the decline, a dirty yellowish crust is formed over the diseased patch, and, on the fall of this crust, the skin is left bald, and of a deep red color; the redness being greatest in the centre, and being slow to disperse. When the deep textures of the skin are much disorganized, the hair is not reproduced, but commonly the hair begins to grow in a few weeks after the fall of the scab; and the new hair is acutely pointed like young hair.

The *diagnostic* characters of scall are: the rapidity of its progress, its exactly circular form, the extreme swelling, tenderness, and copious suppuration, and the sudden and complete fall of the hair. The medical man is not unfrequently tempted to puncture the swelling with his lancet, under the expectation of finding a collection of pus, but in this expectation he is commonly disappointed; and, in bad cases, the inflammation and suppurative action seem to extend even to the periosteum.

TREATMENT.—The local treatment of suppurative inflammation of the scalp, is the maintenance of water-dressing or poultices, until the inflammation is subdued; and then the application of a mild ointment, such as the benzoated ointment of oxide of zinc; or, the red precipitate ointment diluted in the proportion of one part to three of the diluting medium. The general or constitutional treatment must be essentially tonic and nutritive; a substantial meat diet, with malt liquor, aided by iron, quinine, and in chronic cases by arsenic. The ferro-arsenical mixture answers admirably in cases of scalled head.

SYCOSIS.

Syn. *Phyma sycosis*, Mason Good. *Mentagra. Ficous phyma.*

Sycosis (Plate XIV., 1) is a chronic inflammation of the cutaneous textures, somewhat resembling acne, but limited to the hairy parts of the face, the chin, upper lip, submaxillary region, region of the whiskers, eyebrows, and sometimes the nape of the neck. The disease involves the hair-follicles and their immediately related tissues, giving rise to conical elevations, which become pustular at their apices, and are each traversed by the shaft of a hair. The pustules of sycosis are of a pale yellowish color; they burst in the course of a few days, and pour out their contents, which concrete into dark brownish crusts. The crusts fall at the end of one or two weeks, and leave behind them purplish and indolent tubercles, which remain for some time longer, and subside very slowly. The inflammatory action accompanying this eruption often produces thickening of the integument, and frequently extends to the subcutaneous textures. In this way the roots of the hairs sometimes become affected, and fall out, leaving the skin totally bald.

The eruption of sycosis is preceded by a painful sensation of heat and tension of the skin; this is followed by several small red spots, which rise in the course of a few days into conical elevations, and upon

the summits of these the pale yellow pus, characteristic of sycosis, is formed. At their first appearance these pustular elevations are few and scattered; in subsequent attacks their number is increased, until at last the whole of the chin and sides of the face may become thickly studded.[1] The eruption is variable in extent, sometimes affecting one side of the chin alone; at other times the whiskers and submaxillary region are solely attacked, while in another case the disease is confined to the upper lip. When the subcutaneous textures are affected, the integument is raised into tubercles and tumors of considerable size, which are more or less covered with pustules and crusts, and have a repulsive appearance. In this state the integument retains its tuberculated, thickened, and congested appearance, sometimes for years. As the disease declines, the pustular elevations cease to be developed, the tubercles diminish in size, and the epidermis is thrown off by repeated desquamations.

Sycosis contagiosum.—Gruby, of Vienna, so well known for his researches into the vegetable nature of favus, and his discovery of vegetable organisms in other diseases, presented a paper to the Academy of France in 1842, on a new cryptogamic plant, existing in the roots of the hairs of the beard, and around that portion which is contained within the hair-follicle. By the transmission of the seeds of this plant the disease is supposed to be rendered contagious, and he proposes for it the name of *mentagrophyte.*

Gruby gives the following account of the disease: it is limited to the hairy part of the face, but is most frequently seen on the chin, upper lip, and cheeks. It covers all these parts with white, grayish and yellowish scales, which measure from two to six millimetres in breadth, and from three to eight in length. The scales are slightly raised in the middle, their borders are angular, and they are pierced at all points by hairs; they are but loosely connected with the skin, but so closely with the hairs, that in removing a scale we at the same time pull out a hair.

Examination with the microscope shows that the scales are composed of epidermal cells, but the whole of the dermal portion of the hair is surrounded by cryptogamic formations, which constitute a vegetable sheath around it, in such manner that the hair implanted in this vegetable sheath may be likened to the finger surrounded by a glove. It is worthy of remark, that these cryptogamia never rise above the surface of the epidermis; they originate in the matrix of the hair, and in the cells of which the follicle is composed, and ascend so as to surround all that portion of the hair included within the derma. They present everywhere a prodigious number of sporules, which are adherent, on one side, to the internal surface of the follicle, and on the other to the cylinder of the hair; to the former they are closely connected. Each plant is composed of a stem, of several branches, and of sporules.

This disease of the skin, continues Gruby, is an affection of a purely vegetable nature, and is deserving of occupying a place among those

[1] Portraits of Diseases of the Skin, Plate XLI., AE.

disorders, such as favus and aphtha, which consist in the development of parasitic plants, and which might very properly be termed *Nosophyta.*

Gustav Simon adds his testimony to that of Gruby, in favor of the vegetable pathology of sycosis. For my own part I have failed to discover these vegetable fungi, and, for several reasons, entirely disbelieve in their existence.

Diagnosis.—The diagnostic characters of sycosis are, the conical form of the pustular elevations, the bright red color of their bases, their deep-seated relations with the integument, the purplish and indolent tubercles which succeed them, and the site of the eruption. They are distinguished from acne by their situation, and by their relation with the hair.

The pustular diseases, ecthyma and impetigo, have a different character of pustule to that of sycosis; those of the former are large, prominent, and phlyzacious; while the pustules of impetigo are small, little raised above the surface, clustered, and psydracious. The mode of termination of the pustules is equally different: in ecthyma they form large and thick crusts; those of impetigo pour out an abundant secretion which desiccates into bright yellow crusts; while the crusts of sycosis are hard, thin, and of a deep brown color. Moreover, ecthyma and impetigo leave behind them no tubercular thickening of the integument.

Causes.—Sycosis is a disease of the male sex, but in some instances has been seen in the female; it may occur at any period of the year, but commonly makes its attack in the spring or autumn. The most frequent exciting cause is the irritation resulting from the use of a blunt razor, in persons predisposed to such affections, on account of the susceptibility of the cutaneous textures. Other sources of predisposition are, exposure to the night air, intemperance, excess in diet, uncleanly habits, destitution. A common direct cause is exposure to heat; hence we find sycosis to be prevalent among those who work near a large fire, as founders and cooks. Foville has observed the disease to be transmitted by contagion, from the use of a razor employed in shaving an affected person.

Prognosis.—Sycosis is a very troublesóme and obstinate affection, lasting for months, and often for years. This may be inferred when it is recollected that shaving is frequently the primary cause of the disorder, and the necessary continuance of the cause cannot but protract the chances of cure. The disease sometimes gets well spontaneously during the summer, to reappear in the colder months of the year; it is eventually curable.

Treatment.—The foremost indication in the treatment of sycosis is the removal of the cause; to this end, the razor must be used with more care, or set aside for awhile. The stimulus of excessive heat must be avoided, intemperate habits must be restrained, and a moderate diet enjoined. To these rules, which tend to diminish the general excitement of the system, may be added the use of laxatives, as the milder neutral salts, Seidlitz and Rochelle, preceded, according to the

judgment of the practitioner, by one or several doses of calomel or blue pill. If the patient be full and plethoric, a general bleeding will be found a necessary preparation for local remedies. In the chronic state of the affection, it may be desirable to subject the patient to the influence of a course of the bichloride of mercury, and if the system exhibit any signs of debility, tonic remedies or steel medicines may be employed. I have found Donovan's solution of service in this affection, and have also obtained advantage from the use of Fowler's and De Valangin's solutions of arsenic. In the congested state of skin accompanying the eruption, leeches may be applied, or the part well scarified with the point of a lancet, both of these measures being followed by a fomentation of half an hour or an hour's duration, or by a poultice. In the chronic state of the affection, the iodide of sulphur ointment (gr. x ad xx ad ℥j) may be tried, with a fair prospect of success, or the nitrate of mercury ointment, of its full strength or diluted. Other remedies that may be beneficially used in this disease are, the benzoated ointment of oxide of zinc, the spirituous lotion of bichloride of mercury, a solution of sulphuret of potash, nitrate of silver, the juniper tar, &c.

Whenever the hairs are loosened, they may be pulled out, as in this state they are apt to increase the local irritation. Plumbe regarded the hairs as the special cause of the obstinacy of this disease, and laid down rules for their avulsion; and this method of treatment has received the sanction and recommendation of Hebra of Vienna. I used avulsion myself for some years; but was not sufficiently impressed with its advantages to continue the practice; I am induced, however, in deference to the opinion of so great an authority as Hebra, to give the plan a further and more systematic trial. Hebra applies a plaster to the diseased skin at night, and removes it in the morning; and any hairs standing in the midst of a pustule that are not torn out by the plaster, he removes with the forceps.

FAVUS.

Syn. *Crusted or honeycomb ringworm. Kerion. Porrigo lupinosa*, Willan. - *Tinea lupinosa. Tinea favosa. Tinea maligna. Teigne faveuse*, Alibert. *Porrigophyta*, Gruby.

Favus (Plates XIV., XV.) is characterized by the presence of crusts, of a bright yellow color, scarcely rising above the level of the skin, covered by epidermis, 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 epidermis of the adjoining skin, a thin 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. Its crusts are altogether unlike those of other cutaneous diseases. They are situated *not upon* but *under* the epidermis, 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 surface;[1] 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 color[2] 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 uniform 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 entire growth of the crust, and no pressure exerted upon the skin can force through it the morbid formation, otherwise than by rupture.

The growth of the crust is eccentric, fresh matter being deposited in successive rings around that which was first formed, the breadth of the ring 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 color by desiccation, and their outlines may be distinguished as a series of reddish-brown, and concentrically-arranged lines. The alteration of color 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 colored 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.

At its outer margin the crust gradually sinks to the level of the

[1] 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."

[2] 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 alba*."

surrounding skin, and the epidermis 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 around 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-colored (cream-colored) 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 neighboring hairs are implicated in its progress, so that, as 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 or confluent form of the disease 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.

Passing now from the outward characteristics of the disease to the relation subsisting between the morbid formation and the skin, we find that if, with a little care, we break through the epidermis 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 oil-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 color, and that there is frequently a prominent papilla, corresponding with the aperture of the follicle of the hair, which is prolonged downwards 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 basement 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 crust 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 thinned, all trace of papillæ is lost, and the hair-follicles are 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 epidermis 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 epidermis, which is repeatedly thrown off by desquamation. The injured hair-follicles admit of no regeneration, and the diseased spots therefore remain permanently bald.

The color 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 color is paler than 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 the 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 epidermis on the other. From the derma, as I have already shown, the favous substance is easily separable; but, with the epidermis, it is closely identified. Its relation to the epidermal lining of the follicle of the hair is similar to that of its connection with the epidermis.

PATHOLOGY.—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 epidermis, 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 color, 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-colored, becoming, when moistened, as yellow as the deep surface, and broken up into small irregular masses, like mud dried in the sun.

Under the microscope, these three divisions of the crust, namely, its deep, middle, and superficial portions, present differences of structure which I will now 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 inclosing numerous very minute secondary cells ($\frac{1}{10000}$ to $\frac{1}{8000}$); and the latter are formed of several minute transparent granules ($\frac{1}{20000}$ to $\frac{1}{12000}$). 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 ($\frac{1}{4500}$), 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.

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

The epidermis 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.[1]

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. The granule is endowed with an independent life, and is capable of acting both

[1] Page 39.

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 colored than the matter of favus, and when the epidermis 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 color; it becomes, as it were, dried up, is no longer recognizable 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 wish 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 color and modifies the development of the corpuscles. Favous matter, at its softest, appears in the state of 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 $\frac{1}{8000}$ of an inch, while that of the entire cell is $\frac{1}{3000}$. So that these cells correspond very accurately with the multi-nucleated pus-cells, the only difference between them being the distension 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 the preceding paragraphs, it would appear that the vital force inherent in a plastic fluid is employed in the development of molecules of extreme minuteness, primitive 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 separate by degrees, 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 mode of origin of a branch.

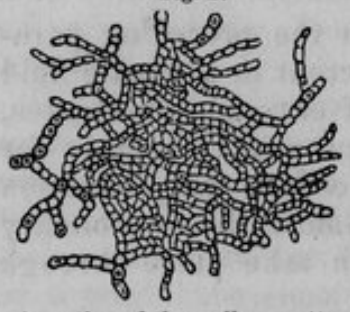
When the process of growth which is here described is accompanied by an active nutritive force on the part of the cells, the cellated stems maintain the original diameter of the cells from which they spring. But when the nutritive force is less active, or the growth is more energetic, then the stems 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 mucedines, has caused them to be considered as plants. They have been described as originating in the cortex of the crust and growing inwards towards 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 narration 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.

Fig. 8.



A portion of the yellow matter from the crust of honeycomb ringworm, showing its plant-like s ructure.

Again, it has heretofore been assumed that the favous matter was contained in the hair-follicles, and consequently in communication with the exterior; a presumption 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 organism

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 in every hundred parts, of

Albumen,	70 parts.
Gelatine,	17 "
Phosphate of lime,	5 "
Water,	3 "
Loss,	5 "

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 the hair 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 color. 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 degree with the structure of the hair, itself a product of cell-formation. Such an interference does take place, and the nature of the morbid alteration I shall now 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 dichotomously, 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. 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 epidermis, 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 easy in all cases 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 aspect according to the focus in which they 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 ap-

pear 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 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 color 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 with 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 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 odor, like that of mice; and when the skin falls into a state of ulceration, the discharge is said to be most offensive, resembling, according to Alibert, the urine of cats; and pediculi are apt to be engendered in great 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 occurrence 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 is 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.

Causes.—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 predisposing 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 mycodermis 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 favor, 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 endeavored 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 connection 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,[1] 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 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 tumors" 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 favor 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-identical 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

[1] Portraits of Diseases of the Skin, Plates XLII., XLIII., B, C.

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.

It appears that favus, which is rare in this country, is 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 communicated 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." Gibert 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, 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 influence, 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 encouraging 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.—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.

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 actions.

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.

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 favus is *iron.* The formula is not very material; I have used the citrate, acetate, and sesquichloride; 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, twice or three times in the day. The iodide of iron is also a useful remedy. When the powers of the system are much enfeebled, the citrate of iron and quinine is an excellent

remedy. 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 orange-peel or gentian; and in chronic and rebellious cases, the ferro-arsenical mixture.

If there be any tendency to strumous enlargement of the lymphatic or mesenteric glands, I recommend the oleum jecoris aselli; and if any tendency to slenderness and flexure of bones, lime-water, or phosphate of lime. 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 to 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 bedtime, 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; by a poultice; or, better still, by means of a piece of Alison's prepared lambskin. I am not favorable 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 affecting 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 (℥j 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 favorable 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. Creasote and tar I rarely use, on account of their powerful odor; 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 an 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 to 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 (verdigris), 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 prepared was spread upon a stoutish black cloth, which was slit in different directions before being applied, to prevent it from forming a 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 whenever 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 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,[1] in the form of ointment, and continue washing and combing

[1] 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.

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, ℥ij.—M.

℞.—Calcis vivi, ℥ij.
Carbonis ligni, ʒij.—M.

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 XXIII.

DISEASES AFFECTING THE SPECIAL STRUCTURE OF THE SKIN.

DISEASES OF THE NAILS AND NAIL-FOLLICLES.

THE disorders of the nails and nail-follicles are referable to alterations in the disposition of the skin around the margin of the nail; in the development, growth, color, and texture of the nails themselves; and, to inflammation, suppuration, and ulceration of the matrix and adjacent soft parts.

In reference to the first of these alterations, we sometimes meet with cases in which the epidermis of the margin of the nail-follicle remains attached to the surface of the nail, and advances with its growth, until the nail is more or less completely covered. This is termed *pterygium unguis*. When less complete, the epidermis is apt to break up into little bands, which curve back and project from the skin around the root of the nail, giving rise to much inconvenience, and often, from being accidentally torn, causing soreness and tenderness of the skin. These little ragged bands of cuticle are called *agnails*, on account of the pain and suffering which they not unfrequently occasion. At other times, instead of growing forward with

the nail, the cuticular margin of the follicle recedes, and exposes the root of the nails. This affection is rare, but has received the name of *ficus unguium*. Rayer remarks that he has observed it among curriers; I have a few times seen it myself, where there existed a chronic state of inflammation of the nail-follicle.

ABNORMAL DEVELOPMENT of the nails is evinced in the occasional congenital absence of those organs; in their disposition to fall from time to time, with and without apparent cause; in their irregular shape, their occurrence in greater number than natural, and in their abnormal position. The *congenital absence* of one or more of the nails is rare, but such cases are sometimes seen. Of the *fall of the nails* (lapsus unguis), I have met with several examples, in which they were regularly shed; new nails being formed beneath, while the old ones were becoming loosened previously to falling off. This morbid peculiarity has been recognized by pathology, and has received the name of *alopecia ungualis*. More frequently, the fall of the nail results from inflammation of the matrix, as in scarlatina, syphilis, &c.; and chronic inflammation of that organ, induced by local injury, burn, frost-bite, or other causes. *Faulty shape* of the nails, *deformitas unguium*, usually results from some disturbance of the secreting organ, the matrix, and sometimes from mal-nutrition, the consequence of deficient innervation, as in cases of paralysis. The nail may be unnaturally long or short, too broad or too much compressed at the sides, too prominent, too flat, or too much arched or curved, *arctura unguis*. Sometimes the nail projects longitudinally, like the angular ridge of a house-top, and, when thickened, has rather the character of a talon than a nail; sometimes it is concave on the surface, the direction of the concavity being longitudinal, or horizontal; and sometimes, it is remarkable for its curve over the end of the finger, as in the *ungues adunci*, the arched and hooked nails so frequently seen in scrofulous and consumptive persons. Now and then we meet with *supernumerary nails*, generally in the form of two rudimentary nails blended together, evincing an intention of bifurcation of the finger or toe. And, occasionally, from some accident of development, we find the nail occupying an *abnormal situation*. The most remarkable illustration of the latter phenomenon is the production of a nail-like growth on the extremity of amputated fingers; even on the stumps of the first and second phalanges, where no rudiment of the original matrix can have existed.

Fig. T.

ABNORMAL GROWTH of the nails is illustrated, sometimes by deficient growth; sometimes by growth in excess; and sometimes by unnatural growth. I have met with instances in which the growth of the nail has been so remarkably slow, that they might almost be taken for examples of complete arrest of growth. In other cases, the growth of the nail has been as striking for its rapidity or extent; the nails sometimes grow to be of

enormous size in Barbadoes leg; and a case of extraordinary growth of the nails is recorded by Saillant, as occurring in a woman named Melin, and named from this peculiarity the "femme aux ongles."[1] Where there has been neglect, as in bedridden and elderly persons, the nails are apt to attain an extravagant size. I have in my possession several toe-nails of this kind, measuring two and three inches in length. Rohout, in a paper addressed to the Academy of Sciences of Paris, has described a toe-nail which measured nearly five inches. Rayer mentions two great toe-nails which measured three inches, and were spirally twisted like the horns of a ram; and Saviard "saw a patient in the Hôtel Dieu, who had a horn instead of a nail upon each great toe." Musæus, in his *Dissertatio de Unguibus Monstrosis*, records a case of unnatural growth of the nails, in which those organs resembled talons, and were five inches in length; while similar horny growths were developed on the skin of other parts of the body.

DISCOLORATION OF THE NAILS is met with in some diseases of the skin affecting the matrix of the nails, as in eczema and lepra; and it also results from injury, as in ecchymosis beneath the nail, the consequence of a bruise, *ecchymoma unguis*. Not unfrequently the nail is speckled with small roundish white spots, *selene unguis*, figuratively named by the ancient writers, *flores unguium;* and, by the moderns, less elegantly termed *mendacia*, or lies. These spots are more common in the nails of children than adults, and result from some slight injury done to the matrix of the nail during the progress of growth.

ABNORMAL TEXTURE of the nail may present itself in the threefold form of, increased thickness, altered density, and altered smoothness of the nails, constituting the state of disease known as *degeneratio unguium*. Or the matrix of the nail may be the subject of inflammation, suppuration, and ulceration, constituting *onychia*. We may now proceed to the consideration of these two forms of disease.

DEGENERATIO UNGUIUM.

Defœdatio unguium. Scabrities unguium.

The nails sometimes acquire an excessive degree of *thickness*, and the increase of bulk is accompanied with a yellow and dirty discoloration, the nail resembling horn, rather than its own natural texture, both in color and density. In this state it is not uncommon to find the nail separating from its matrix, and a dry, whitish, broken substance collected in large quantity beneath it. Two such cases are now before me, in which the greater part of the fingers of both hands are affected in this manner.

In another case, also under my observation at the present time, the nails are reduced to a mere film, and so soft and brittle in texture, that

[1] Saillant, Mémoire sur la maladie de la femme dite aux ongles. Paris, 1776, 8vo.

they split and break with the slightest pressure, *mollities unguium;* the texture of the nail is healthy, but its quantity deficient, and with the absence of quantity there is also, as a matter of course, an equal defect of firmness and tenacity. This state of the nails is a subject of much annoyance to the lady who is the sufferer from the affection; the ends of the nails are always ragged and broken, they catch in her clothes and in almost everything she touches; and when they are torn, they occasion bleeding and soreness of the matrix. Sometimes the nails are brittle from a morbid alteration of texture, being converted into a white earthy matter which breaks up into shapeless granules on the application of a slight degree of pressure.

Fig. V.

A. B. C. Forefinger, middle, and ring finger, showing the broken and disfigured state of the nail, in degeneratio unguium; fissura unguium.

Another change in the nails for which I have been several times consulted, is a fibrous state of those organs, which appear to be made up of a thick stratum of fibres, closely packed together, but becoming loosened here and there, so that separate fibres are met with on the surface. The surface of the nail is necessarily rough, ragged, discolored, and marked by numerous dark longitudinal lines; and, besides being very unsightly, adheres like a burr to any rough material with which it comes in contact.

Another variety of degenerated nail has the appearance of being *eroded*, or worm-eaten, *tinea unguium*, and sprinkled over more or less abundantly with hollow pits. This state of the nail, like the preceding, is very unsightly, and the sufferer applies for relief, rather on account of the ugliness of appearance, than from any real inconvenience. Unhappily, medicine can afford very little aid in these cases.

ONYCHIA.

Onychia is an inflammation of the matrix of the nail, sometimes confined to that structure only, but more frequently involving the immediately surrounding soft parts. The inflammation is succeeded by suppuration, and ulceration to a greater or less extent, the production of granulations of large size and unhealthy texture, of a fungous character, and an ichorous, sanious, and fetid discharge. The inflammation is sometimes superficial, sometimes extends to the deeper parts; sometimes terminates in the loss of the nail, or a part of the nail; and sometimes runs on to disease of the periosteum and bone. It is always a painful, and sometimes a troublesome and rebellious disease.

Onychia may be partial, that is, may attack a single nail only, or it may affect a greater number; it may also involve a part or the whole of the nail in destruction. It may occur along the edge of the nail, or at its root; and it may be either acute or chronic in respect of its progress.

It varies also according to the cause which shall have given rise to it; whether that cause be one of *external injury*, as a bruise, a splinter, a puncture, or a foreign body lodged beneath the nail. Whether it shall have been produced and kept up by the pressure of the side of the nail against the soft parts, giving rise to the *growing in* of the nail. Or whether its cause may be *internal* and constitutional, as that produced by eczema, scrofula, or syphilis.

In onychia resulting from external injury the treatment should be such as is applicable to a similar injury, when occurring in any other situation. If pus be formed beneath the nail, the nail should be thinned by scraping until reduced to a mere film, and then it should be punctured to allow the escape of the matter; the same manœuvre is applicable to the relief of the inflamed matrix when swollen by congestion; or to the removal of a foreign body lodged beneath the nail.

Onychia from in-growing nail originates frequently, and indeed generally, in interference with the growth of the nail in length by contact with the boot or shoe. Prevented from growing forwards, the nail is apt to spread laterally, and the skin pressed forcibly against it, becomes inflamed; the inflammation increases from day to day; or after much walking the skin becomes red, swollen, and painful, adding still further to the pressure; then suppuration takes place, next ulceration, the production of fungous granulations and an unhealthy discharge. The medical management of this case consists in the withdrawal of the cause by rest and position; then the removal of the offending border of the nail; and the general relief of the inflammation by scraping the whole surface of the nail, until it becomes thin and pliable, and capable of yielding to the swelling of the inflamed parts.

Eczematous onychia is usually accompanied with eruption on other parts of the fingers and hands, and frequently on several regions of the body. It does not call for any special treatment, but usually gets well when the general eczema is relieved.

Scrofulous onychia commonly attacks the nail-follicle, and the inflammation spreads to the whole of the skin immediately bordering the nail; by degrees the entire end of the finger is inflamed and enlarged, and the nail looks as if it were sunk into a deep hollow, surrounded by a tumid border of a deep red or purplish hue. The finger has the appearance which is commonly denominated *clubbed*, and as the disease advances, and fungous granulations spring up from the ulcerated surface, the nail is sometimes completely concealed from view.

Syphilitic onychia has already been considered in the chapter on syphilitic eruptions; like scrofulous onychia it may attack the follicle of the nail, and is not confined to the lateral border, as in the case of in-growing nail. It is always accompanied by other signs of syphilis, and frequently with syphilitic eruption in other regions of the body.

Onychia maligna is the name assigned to a peculiarly obstinate and severe form of the disease, apparently of idiopathic origin. It begins in the follicle of the nail, and is attended with excessive pain, and the secretion of an offensive discharge. It is the malignant onychia, which

sometimes extends so deeply as to affect the periosteum and bone; and is often many months under treatment.

The *diagnosis* of onychia is self-evident, the only disease with which it can possibly be confounded being *panaris*, or common whitlow. Whitlow, however, begins in the skin at the end of the finger, or in the vicinity of the nail, and does not attack the matrix; it is simply a phlegmon in this situation; but when of large size, or, in its commencement, attacking the skin close to the border of the nail, the pus not unfrequently extends beneath the latter.

The *causes* of onychia have been already stated; they are, direct violence or injury, continued irritation from in-growing nail, and the constitutional and specific affections, eczema, scrofula, and syphilis. The cause of onychia maligna must be referred to some general derangement of the constitution, probably mal-assimilation and cachexia.

TREATMENT.—The medical management of onychia from external injury, must be the same as that for injury in other parts of the body, with the exception of reducing the thickness of the nail by scraping, which is applicable to every form of the disease, and paring the nail so that it may not press on the inflamed skin, and increase the local irritation. Thinning of the nail, besides rendering it pliable, also facilitates the evacuation of pus, or the removal of foreign bodies impacted beneath it.

In onychia, from in-growing nail, the removal of the cause, the relief from pressure, complete rest, thinning and paring the nail, and the application, if necessary, of nitrate of silver to the exuberant granulations, are generally successful. Where a fetid discharge is secreted, the solution of the chloride of lime is a necessary part of the treatment in all cases of onychia, and is, besides, a useful stimulant. Other local remedies are, the benzoated ointment of oxide of zinc, an ointment of Peruvian balsam, the yellow basilicon ointment, and strapping with adhesive plaster. It is sometimes useful to introduce a piece of lint, either dry, or coated with ointment, beneath the swollen and overhanging skin along the border of the nail.

The constitutional forms of onychia call for a treatment adapted to the particular disease of which they are a part, whether eczematous, scrofulous, syphilitic, or malignant. And constitutional remedies must be made a leading part of the general management. The best local application in eczematous onychia is the benzoated ointment of oxide of zinc. Scrofulous onychia will require gently stimulating remedies, after the primary heat and inflammation have been subdued by cooling lotions, fomentations, and water-dressing, or poultices. For the syphilitic onychia, besides local antiphlogistic treatment as long as inflammation continues, the applications should consist of mercurial ointments. But this form of onychia will always yield to constitutional means. Onychia maligna calls for the use of alteratives and tonics; and severe local treatment is sometimes required, such as caustics, the actual cautery, and avulsion of the nail.

CHAPTER XXIV.

HISTORY AND DESCRIPTION OF THE ITCH-ANIMALCULE.

ACARUS SCABIEI.

A POPULAR knowledge of the existence of the itch-animalcule is probably coeval with the first development of scabies in the human race, since we find that the earliest writers mention it as possessing a popular synonym. Our dictionaries afford us similar information, and most observers have noticed the fact that a living creature is commonly extracted from the bodies of those affected, by members of their own class, and by fellow-sufferers.

The earliest scientific information relative to the itch-animalcule that we find recorded, dates as far back as the time of Aristotle, 350 years before the Christian era. For we are informed by Moufet, in the commencement of his chapter, "De syronibus, acaris, tineisque animalium," that ARISTOTLE was acquainted with these syrones, a statement which he precedes by a reproof to Thomas a Veiga for making an assertion to the contrary. For, says he, "Syronem antiquitate ignotum fuisse Tho. a Veiga falsò memorat, nam ipsum ἀχαρίδιον Aristoteles vocat." (5 Histor. Animal., cap. 32.)

That the itch-animalcule was well known to the GREEKS may also be inferred from the names *siro* and *acarus* by which it is designated, for, according to Moufet, both of these terms are derived from the Greek language. "Syrones item dici videntur, ἀπὸ τοῦ σύρδην, ἕρπειν quia *tractim sub cute repunt.*" And again he observes, "τὸ γὰρ ἄχαρες, teste Polluce et Suida, exiguum illum dicitur, quod ab exiguitate non possumus χεῖραι, id est, dividere."

The ARABIANS were also acquainted with the animalcule at a very early period, for we find ABINZOAR, in the twelfth century, thus speaking of them: "Syrones *Assoalat* et *Assoab* dicti, sunt pedicelli subter manuum crurumque et pedum cutem serpentes et pustulas ibidem excitantes aquâ plenas: tam parva animalcula, ut vix visu perspicaci discerni valeant."[1] But Moufet expressly tells us that Abinzoar is the only one amongst the ancient authors who shows any knowledge of scabies and of the proper method of treating it, "Horum nullus antiquorum meminit præter Abinzoar qui morbum hunc vidit et curationem ejus recte instituit."

The ROMANS named the itch-animalcule *pedicellus;* and from several quotations made by Moufet, we learn that the Roman physicians were well acquainted with it.

[1] Moufet, Theatrum Insectorum, p. 266.

SCALIGER, in his letter to Cardanus in 1557, remarks that the acarus is globular in form, and so minute as to be scarcely perceptible. The Turinians, he observes, called it *scirro*, and the Gascons, *brigant*. The little creature lives in canals which it burrows in the epidermis, and when taken out and placed upon the nail, exhibits a certain degree of movement, which is much increased by the warmth of the sun. When crushed between the nails, a slight noise is heard, and a small quantity of watery fluid is perceived.[1]

GABUCINUS observes, "Ad nostra tempora quoddam supplicii genus indomita fœditate pervenit; in manibus exilis quidam pedicellus, lente minor, sub cute serpit."

INGRASSIAS, after referring to the statement of Abinzoar, observes, "Excoriata cute ubi minimus ille jonthus varulusve, cujusdam sudaminis instar apparet, exeunt animalcula viva, tam parvuncula ut vix possint videri."

JOBERTUS very aptly compares them with moles, but unfortunately invalidates this testimony by supposing them to be the hidden cause of porrigo; for, says he, "nascuntur sæpe in capite et pilorum radices exedunt, quos Græci τριχοβρώτους, τριχοσρώκτας, σητὰς, τριχοβόρους, tineas peculiari nomine appellant."

ALDROVANDUS, also, in 1596, draws attention to the minute size of the *pedicello*, its resort in burrows beneath the epidermis, and its excitation of vesicles. He remarks that we need sharp eyes and a good light in order to perceive it.

MOUFET, in his famous work already referred to, the *Theatrum Insectorum*, published in 1634, by Sir Theodore Mayerne, after the death of its author, but commenced during the preceding century by Wotton, Gessner, and Penn, gives the first account of the itch-animalcule published by an English writer. In this volume we find recorded a very complete description of the creature, and the most important facts with regard to its habits are accurately noted. In truth, little is known on the subject, at the present day, that was not already pointed out by that distinguished writer. In reference to their size and form, he observes, "Syronibus nulla expressa forma (ut recte Scaliger notavit) preterquam globi: vix oculis capitur magnitudo tam pusilla, ut non atomis constare ipsum, sed unum esse ex atomis Epicurus dixerit." In another place he remarks, "Animalculum est omnium minutissimum;" its color, "est albicante, capite excepto; propius intuenti nigricat, vel nigro parum rubet;" and it moves briskly when liberated from confinement, and stimulated by light and warmth. "Extractus acu et super ungue positus, movet se, si solis etiam calore adjuvetur." He remarks upon the burrowing habits of the creature, and the situation in which it is usually found, "Ita sub cute habitat, ut *actis cuniculis* pruritum maximum loco ingeneret;" and again, "Mirum est quomodo tam pusilla bestiola nullis quasi pedibus incedens, tam longos sub cuticulâ sulcos peragat. Hoc obiter est observandum, syrones istos non in ipsis pustulis sed prope habitare." He, moreover, rebuts the notion of their being

[1] Exercitatio 194; de Subtilibus; num. 7, 1557.

allied to pediculi, and defends Aristotle against such an insinuation. "Neque syrones isti sunt de pediculorum genere ut Johannes Langius ex Aristotele videtur asserere: nam illi extra cutem vivunt, hi vero non: neque revera Aristoteles ullo quod sciam scripto inter pediculos acaros numeravit." His inference respecting their origin, drawn from their habitation, savors rather of the times than of the truth. "Illorum quippe proprium est non longe residere ab humore aqueo in vesiculâ vel pustulâ collecto: quo absumpto, vel exsiccato, brevi omnes intereunt. Unde colligimus, quemadmodum ex sero putrefacto exoriantur, sic eodem vicissim sustentantur." Moufet falls into the pardonable error, since repeated by several modern authors, especially by Linnæus, of confounding the acarus scabiei with the acarus domesticus. Thus, he remarks, that the syrones are produced in decayed cheese and wax, and when found in these substances, as well as in leaves and dried wood, they are termed *mites*, "sed in homine *wheale wormes* dicuntur, et Germanice, *Seuren*."

In the year 1654, AUGUSTUS HAUPTMANN, a German physician, published a work on baths,[1] in which he speaks of the Acari or Sirones which he found in persons affected with scabies. These, he says, are in German called "Reitliesen;" they have six legs, and in appearance they resemble the mites of old cheese. To Hauptmann belongs the credit of giving the first figure of the animalcule; which is referred to by Bonanni, both in his own work and in his edition of Kircherius, in the following terms: "Monstrosam eorum figuram cum permultis et oblongis post tergum caudis depinget."

HAFFENREFFER, in 1660, also a German physician, alludes to the acarus as a species of pediculus of very minute size, breeding between the epidermis and the derma.[2]

In 1682, a short notice of the animalcule, attributed to ETMULLER, is given in the first volume of the *Acta Eruditorum Lipsiæ*.[3] In this account reference is made to Scaliger's observation of its globular form, and to the opinion entertained by Rohault[4] of its back being covered with scales: "Dorsum sit squammosum seu squamis coopertum." The author gives the following description of them: "Colore sunt albicante et pedibus exceptis, qui propius intuenti nigricare videntur, pedibus sex instructi sunt, binis utrinque mox juxta caput positis, quibus talparum ritu canaliculos sub cuticulâ agere, ut oblongos non raro, quasi sulcos, trahere, simulque molestissimum pruritum excitare videntur." The paper is illustrated with three figures, drawn with an object-glass of low power; they are somewhat coarsely executed, but afford a tolerably fair representation of the general characters of the animalcule.

During the following year, namely, in 1683, Giovanni Cosimo Bonomo published his letter to Redi,[5] which was translated into Latin by

[1] Uhralten Wolkensteinischen Warmen Bad und Wasser schatze, 8vo. Dresden.
[2] Nosodochium cutis affectûs. Ulmæ, 1660.
[3] For September, 1682, p. 317.
[4] Trac. Physic., par. i. cap. 21, 1798.
[5] Observazioni intorno, a pelicelli del corpo umano del G. Cos. Bonomo, in una lettera al Fr. Redi.

Lanzoni,[1] in 1692. An abstract of this letter was read before the Royal Society by Dr. Mead, and published in the Philosophical Transactions[2] for 1702. Bonomo gives a more perfect account of the acarus scabiei than had hitherto existed. His attention was first drawn to the subject by meeting with the popular name of the itch-animalcule in his *Vocabulario dell' Academia della Crusca*, followed by the accompanying explanation: "*Pellicello e un piccolissimo Bacolino, il quale si genera a Rognosi in pelle e rodendo cagiona un' acutissimo pizzicore.*" He then betook himself to researches with the view of determining the truth of this definition, in which he was aided by his friend Hyacintho Cestonio, who informed him that he had seen "mulierculas propriis e scabiosis filiolis acûs extremitate, nescio quid educere, quod in læve manûs pollicis ungue, alterius manûs pollicis ungue compressum, in ipsa compressione aliquem parvum sonum facere videtur, hoc autem educi a minutioribus tuberculis scabiosis, perfecta nondum sanie scatentibus, vel ut vocitant immaturis; mutua quod itidem charitate inter remiges et mancipia Balnei Liburnensis, si scabies infestaret fieri, adnotavit." Having obtained one of the animalcules, Bonomo examined it with the microscope, and "found it to be a very minute living creature, in shape resembling a tortoise, of a whitish color, a little dark upon the back, with some thin and long hairs, of nimble motion, with six feet, a sharp head, with two little horns at the end of the snout."[3]

Bonomo gives two rude figures of the animalcule, which are inferior to those in the *Acta Eruditorum*, and must have resulted from the use of a bad microscope. He also delineates its "very small and scarcely visible white egg," and stands alone in this observation. Two remarks in Bonomo's letter are especially deserving of attention; the first is his comparison of the *siro* with a little bladder of water; and the second, his observation relative to their habitation in vesicles, "immaturis;" both of which are invaluable as aids in seeking for the animalcule.

Morgagni, in his 55th Letter, book 4, contributes his evidence to the existence of the itch-animalcule and records a case in which he saw the creature himself.

In 1691, Philip Bonanni, in his *Observationes circa viventia quæ in rebus non viventibus reperiuntur*, as well as in his edition of the *Rerum Naturalium* of Kircherius, refers to the opinions of Bochartus, Kircherius, and Borellus. Kircherius found these minute creatures, "candidi puncti similitudinem," when examined with the microscope, to be "animalia pilosa et prorsus urso similia." Borellus, he observes, "histrici similia facit;" but this author, I am inclined to think, describes the acarus domesticus, and not the acarus scabiei; although he was evidently acquainted with the latter, since, in his *Historiarum et Observationum Medico-physicarum*, under the title of "Ulcera pedicu-

[1] Observationes circa humani Corporis Teredinem. In Miscell. Natur. Curios. for 1692.

[2] Philosophical Transactions, vol. xxiii. p. 1296, pl. 283.

[3] Philosophical Transactions, abridged, vol. v. p. 199.

losa,"[1] he records an instance of vesicular affection apparently identical with scabies. Bonanni gives four figures of the animalcule, one from Bonomo's letter, two from the *Acta Eruditorum*, and one of his own. Concerning the latter he observes, "insectum hexapode, quod motu erat pigrum, colore livido, et raris setosis villosum."[2] In size it was about equal to a grain of sand; and he concludes his description with the following question: "Unde nam istos animatorum semiatomos erupisse judicabimus?" From the examination of his figure, which is of large size, and exceedingly rude, and from his statement that four of the little animals were sent to him by Baldigianus, a professor of mathematics in Rome, and who had extracted them from the face of one of his scholars, it is quite evident that they are pediculi pubis, and not acari. Bonanni recopies the four figures from Kircherius.[3]

In 1744,[4] BAKER, in a curious work, entitled the *Microscope Made Easy*, for the perusal of a copy of which I am indebted to my kind friend, Dr. Grant, remarks, "The microscope has discovered what, without it, could scarcely have been imagined, that the distemper we call the itch is owing to little insects under the cuticula, whose continual bitings cause an oozing of serum from the cutis, and produce those pustules and watery bladders whereby this disease is known." He then quotes the description of the animalcule, and the mode of finding and extracting it, given by Bonomo, and copies the two figures of this author, not forgetting the ovum.

In 1762, CASAL, a Spanish physician, in a work, entitled *Medical Researches on the Asturias*, referring to the burrowing and grubbing habits of the acari, remarks, "Vocantur aratores, et merito, arant enim semper inter cuticulam et cutem."

In 1786, DR. WICHMANN, of Hanover, was induced to verify the prevailing opinion of the existence of an animalcule in connection with scabies, and the results of his labors are published in a volume entitled *Ætiologie der Kraetze*.[5] He found the zoological characters of the animalcule undecided, and the precise species infesting the skin in scabies undetermined. "Thus," he remarks, "of many naturalists, to name only a few of rank, Linnæus has only *tentacula*, Schæffer has *antennæ pediformes articulatæ*, while Baron de Geer expressly says, they have no antennæ, but two arms with joints, which resemble those of spiders, which have likewise no antennæ." He alludes also to the opinion of Linnæus, that the acari farinæ might be conveyed, in the powder used in dressing children, to their skins, and there colonized; and he attributes to this error on the part of the great naturalist the assertion made by Professor Murray,[6] "that previous to any appearance of pustules (in scabies), there is always a foulness of the juices, and that when this foulness has got a certain height, the acari of cheese or meal are induced to seek a nidus in the skin." Dr. Wichmann refers also to the omission of distinction of

[1] Obs. 20. [2] Fig. 114. [3] Fig. 95.
[4] This is the date of the third edition.
[5] 8vo. 1786; and London Medical Journal, vol. ix. 1768, p. 28.
[6] De vermibus in Leprâ obviis. Göttingen, 1769, p. 9.

species by Pallas,[1] for that author remarks, "Acarus scabiei, acaro farinæ est consanguineus." De Geer, however, distinguishes the two species very accurately, for of the acarus farinæ he observes, "Acarus oblongus albus capite refuscente, pedibus conicis crassioribus æqualibus;" and of the acarus scabiei, "Acarus subrotundus albus, pedibus rufescentibus brevibus; posticis quatuor seta longissima, plantis quatuor anticis fistulatis capitulo terminatis." The author points out the vesicles as the seat of habitation of the animalcule, but he observes, that "even before such a transparent vesicle is formed, we may often discover traces of the insect on the fingers or hands, in a reddish streak or furrow," and "it is even more usual to find it in these furrows than in the pustules themselves." The furrows he discovers only on the hands and fingers. Dr. Wichmann gives two figures of it, as examined with an object-glass of high power. These are very correct, and give a better idea of the little creature, as seen by that instrument, than any other delineations published. Like his predecessors, he makes no attempt to describe the zoological characters and structure of the animalcule.

In 1805, Dr. Adams gives two excellent figures of the itch-animalcule in a paper[2] addressed to Sir Joseph Banks, and read before the Royal Society in the month of April of that year. This paper is entitled, *An Account of the Acarus Siro, Acarus Exulcerans of Linnæus; by some considered as the Itch Insect.* The figures of the acarus which accompany this paper are superior to any that have been published either before or since, and are sufficient to identify the animalcule completely with the acarus scabiei. The author's observations were made in Madeira, where, it would appear, the creature is extremely common, and is called *oçao*, *ouçou*, *ouçam*. Dr. Adams gives no zoological description of the animalcule, but confines himself chiefly to the disease engendered by its presence, and to the mode of detecting the oçao. In the latter art he was instructed by an old woman, and he confesses himself to have been a dull scholar; but the results of his searches afford no better information than that which I have already adverted to, as contained in the *Theatrum Insectorum* of Moufet. The principal seat of the animal, says Dr. Adams, is a "reddish elevation" at the end of a "somewhat knotty" reddish line, extending from the vesicles for the distance of about a quarter of an inch. The author attributes to the animalcule a "power of leaping with a force not less than a flea. Such was the case with one whilst I was examining it under a convex lens." In this he is entirely mistaken; for the creature is deficient in the organization necessary for such an effort, and its sudden disappearance from the field of his lens is rather to be ascribed to some untoward movement occurring during the adjustment of his optical apparatus. Dr. Adams expresses himself unwilling to accord to Bonomo all the credit which that writer claims; and in reference to the discovery of the egg, remarks, "without suspecting the good intention of this writer, you will readily admit the uncertain discrimination of the egg of an

[1] Dissertatio de infestis viventibus, 1760, p. 2.
[2] Published in his work on Morbid Poisons, 4to., 1807, p. 293.

insect, described by De Geer as about the size of a nit, but which, on placing it under a microscope, by the side of a nit, did not appear more than a fourth part of its bulk. For myself, I never could discover what could satisfactorily be called an egg."

Hitherto Dr. Adams has spoken of the oçao as being identical with the itch-animalcule of Bonomo and other writers, but in subsequent paragraphs he declares his belief that the disease engendered by the ouçoes, and that of the itch, are perfectly distinct, and he founds this opinion upon the following data:

1. The disease of ouçoes is attended with considerable febrile disturbance, and sometimes with severe local symptoms.

2. It is easily cured; by extracting the animalcules, by the white precipitate ointment, or by the use of sulphur internally.

3. It is liable to recur from the development of undestroyed ova, unless the remedies be continued for a month after the apparent cure; and even then, if the disease be cured in the autumn, it is liable to return in the spring, because the animalcules remain torpid during the winter.

4. It is always attended with vesicles which possess great uniformity, and have each a red line; whereas in itch the vesicles are variable in size.

5. The natives of Madeira entertain a disgust for the itch, which they call *sarna;* whereas the ouçoes give them no discomfort.

6. The dictionaries of all languages are opposed to the similarity of the affections, since they indicate a name for the animalcule distinct from that of the itch.

7. John Hunter could never discover the itch-animalcule.

Now, all these objections, cogent as they may have appeared to the author, must fall to the ground the moment that the animalcule is shown to be present in the itch, and to be the cause of that affection. Nor would it be difficult to prove, seriatim, that each of the objections above cited is unfounded. The figures appended to Dr. Adams's papers are so excellent, that I am inclined to assign to them a rank superior to those of Wichmann, although the object of the two authors is widely different, and scarcely admits of comparison; for while the figures of Adams are intended to trace form and general character, in those of Wichmann there is a manifest endeavor to exhibit texture also.

The year 1812 witnessed the performance of a remarkable scene in the memoirs of the acarus scabiei. M. Galés, Pharmacien of Saint Louis, tempted by a prize offered by an unbeliever in the existence of the little animal, introduced the gentle stranger to the wondering gaze of the *notabilities* of Paris. The Academy applauded, the crowns were paid, and the pencil of the artist of the Musée Royale was called to perpetuate the juggle. He drew to the life the common meal-mite! (acarus farinæ). It is needless to say, that the statements put forth by M. Galés were, from beginning to end, a tissue of deceptions, and to have written such stuff as that contained in his paper is the best proof that he could never have seen the animalcule. M. Patrix played pantaloon to M. Galés's clown.

The discovery of the treachery of M. Galés was not, however, made for a considerable number of years, when, with some difficulty, Raspail succeeded in proving the identity of the insect of Galés with the acarus farinæ. The consequence of the exposure was universal distrust, and in this state the question remained, until a young student from Corsica, M. RENUCCI, in the year 1834, exhibited the veritable animalcule in the clinical theatre of Alibert, and demonstrated the method of discovering its lurking-place in the epidermis.[1]

The subject was next taken up by M. ALBIN GRAS, a student of St. Louis, who has shown himself well qualified for the undertaking. He published a small treatise[2] in the autumn of 1834, in which he gives a good summary of the knowledge of our ancestors relative to the animalcule, explains the manners and habits of the little creature, and details some excellent experiments made by himself, in reference to the mode of treatment of the disease. The habits of the acarus, when placed upon the skin, are detailed in a chapter of this volume, as also are M. Gras' experiments with medicinal agents on its powers of vitality. After giving a description of the animalcule inferior to that of M. Raspail, the author remarks: "If we observe the mode of progression of the insect on the epidermis, we may easily assure ourselves that it does not bore its cuniculi in the manner of the mole, by means of its anterior legs, for the legs are not disposed to enable the creature to effect its object in this manner, but it lifts the epidermis by means of its flattened snout. The hairs upon its back aid it in this operation, for being directed posteriorly, all return on the part of the animal is rendered impossible."

"In examining several sarcoptes beneath the microscope, we frequently perceive them to lay several small, white, oblong, and transparent eggs, the eggs, according to M. Duges, being one-third the length of the animal." "If we place an acarus on the epidermis, we perceive it to dodge about here and there, following by choice the course of the folds of the skin, and every now and then fixing itself upon the epidermis, and raising the posterior part of its body."

In 1834, RASPAIL published his *Mémoire comparatif sur l'Histoire naturelle de l'Insecte de la Gale*, in which he details the history of modern discovery in France relative to the itch-animalcule, a narrative replete with misadventures, that the perusal of Moufet would have effectually prevented. In 1831, he had seen and delineated the acari scabiei of the horse, but it was not until three years afterwards that he was first shown by Renucci the animalcule of the scabies of man. After describing the epidermal cuniculi which are burrowed by the creature, he observes that the precise seat of the acarus is indicated by a *white* point. His description of the animalcule is the following: It is white, scarcely half a millimetre in diameter, head and feet reddish and transparent, and it is invested by a covering which is hard, dense, and resisting. Its *abdomen* is flat and smooth; the *dorsum*

[1] Some account of M. Renucci's mode of procedure will be found in the Gazette des Hôpitaux, and Gazette Médicale for 1834.

[2] Recherches sur l'Acarus, ou Sarcopte de la Gale de l'Homme. Par Albin Gras. Paris, Octobre 11, 1834.

presents three prominences, one, of very large size, in the middle; one, next in size, over the abdomen; and one near the head. Along the *lateral border* of the creature, the dorsal and ventral surface join like the carapax and plastrum of a tortoise, and the resemblance to the shell of this animal is increased by the projection of the head and anterior legs from the space between the carapax and plastrum in front, between which they appear capable of retraction. The *head* is provided with two large eyes, placed laterally; it is surmounted by four antennæ, which are disposed in two rows between the eyes; the trunk is folded beneath the head. The *anterior legs* have four joints, and a haunch-piece at the base of each; they are terminated by a stiff ambulacrum, furnished at its extremity with a sucker. The *posterior legs* have the same number of pieces as the anterior, but are not more than one-fourth their length, and scarcely project beyond the abdomen. Each leg is terminated by a long hair in place of an ambulacrum. The *anus* projects, more or less, from the posterior border of the carapax, and is bounded by two short parallel hairs on each side. The carapax and plastrum are horny in texture; the former is surmounted by stiff horny hairs, disposed in a certain order, two rows passing backwards from the centre to each side of the anus, and two forwards to each side of the head. The structure of the carapax is reticular, the meshes extending transversely.

The figures accompanying this excellent description of the animal do great injustice to the text; they are inferior to those of Adams, and also to those of Wichmann, neither of which appear to have been known to the author; while he praises the figures of De Geer, which are inferior to both.

Besides the authors above referred to, some account of the acarus scabiei will be found in *Schenkius*, Obs. 676; in *Rosenstein*, on the diseases of children; *Pallas*, De Infestis Viventibus, 1760; *Sauvages*, Maladies de la Peau; *Miscellanea Curiosa*, 1692; *Annales des Sciences d'Observation*, vol. ii. p. 446, vol. iii. p. 298, 1830; *Lancette Française*, Août, 1831; *Bulletin de Thérapeutique*, vol. vii. *Journal des Connaissances Médicales*, Septembre 15, 1834. And for the comparative history of the animalcule, *Walz*, De la Gale de Mouton.

Linnæus, from an imperfect acquaintance with the acarus scabiei, has been the cause of much of the confusion and obscurity which have involved the history of this animalcule. He places *acarus* in his order *aptera*, and gives the following as the characters of the genus:[1]

Os proboscide carens, haustello vaginâ bivalvi, cylindricâ, palpis duobus compressis, æqualibus, haustelli longitudine.

Oculi duo ad latera capitis.

Pedes octo.

Tentacula duo, articulata, pediformia.

In the first edition of the *Fauna Suecica*,[2] Linnæus describes the animalcule under the specific designation of "*acarus humanus subcutaneus*." In the second edition[3] he considers the acarus humanus

[1] Systema Naturæ, 1767.
[2] Entomologia Faunæ Suecicæ. Villers's edition, 1789. No. 1194.
[3] Anno 1761. No. 1979.

subcutaneus as belonging to the same species as the flour-mite and cheese-mite; and in the *Systema Naturæ*, observes, "Inter sirones Farinæ, Scabiei, Phthiseos, Hemitritæi vix etiamnum reperiri alias differentias quam a loco petitas;" while he admits the itch-animalcule as a new species, under the name of "*acarus exulcerans.*" The specific characters of the two species he thus indicates:[1]

"*Acarus siro.*—A. lateribus sublobatis, pedibus quatuor posticis longissimis, femoribus capiteque ferrugineis; abdomine setoso.

"*β. A. humanus subcutaneus.*

"Habitat sub cute hominis scabiem caussans ubi vesiculam excitavit, parum recedit corporis rugis secutus, quiescit iterum et titillationem excitat; nudis oculis sub cuticulâ delitescens observatur ab adsueto acu facile eximitur, ungui impositus vix movetur, si vero oris calido halitu affletur agilis in ungue cursitat.

"*Descriptio.*—Minimus, magnitudine vix lendis subrotundus, capite vix conspicuo, ore ut et pedibus rufis sive testaceis; abdomen ovatum hyalinum; in dorso duplici linea lunari seu pari linearum fuscarum recurvatarum notatum et quasi lobo utrinque.

"*Acarus exulcerans.*—A. pedibus longissimis setaceis; anticis duobus brevibus.

"Habitat in scabie ferinâ, cujus caussa est."

In the *Entomologia Faunæ Suecicæ* of Linnæus, edited by Villers,[2] the editor retains the above "*Descriptio*" in connection with acarus siro, but the "Habitat" he transfers to acarus exulcerans, commencing it thus: "Habitat in scabie ferinâ, sub cute hominis." To this he adds the observation of Fabricius, "Acaro sirone minor et distinctus et forte acaro exulcerante non diversus." Then follows the "Descriptio. A. albus, diaphanus; corpus rotundatum, scabrum, nigro non lineatum uti acarus siro." The editor concludes with two remarks from his own pen: "Obs. 1. In *Fauno Suecica*, ed. 1, acarum farinæ et scabiei separaverat Linnæus, postea conjunxit, sed DD. Geoff., Fab., De Geer, pro diversis speciebus rité habuerunt; ergo veré distincti. Obs. 2. Scabiei certe hic acarus caussa est."

In the 13th edition[3] of the *Systema Naturæ*, the acarus siro, comprising the meal-mite and cheese-mite, is separated from acarus scabiei, but the acarus exulcerans is retained. The specific characters of the acarus scabiei are thus stated:

"*Acarus scabiei.*—A. albus, pedibus rufescentibus; posterioribus quatuor seta longissima.

"*Habitat* in ulceribus scabiosorum, cutis rugas sequendo penetrans, titillationem excitans; utrum causa, an potius, symptoma mali? Sirone multo minor."

Of the acarus exulcerans, Linnæus remarks, "Habitat in ulceribus scabie ferinâ laborantium. An satis distinctus ab A. scabiei?"

In the *Amœnitates Academicæ*[4] the following passages, which are

[1] Fauna Suecica. Editio altera, auctior, 1761, Nos. 1975, 1976.
[2] Anno 1789.
[3] Edited by Gmelin, anno 1788, vol. v.
[4] Miraculo Insectorum. By G. E. Avelin. Upsal, 1752. Amœnitat. Acad., vol. iii. p. 333.

deserving of notice, occur. The first conveys the best idea of the seat and appearance beneath the cuticle of the acarus that I have met with in any writer; the latter puts forth the unfortunate observation which led Linnæus into error with regard to the classification of the itch-animalcule. Speaking of the vesicles, the writer observes, "Parum vero ab illa in ruga cutis punctum quoddam fuscum quod nondum in vesiculam se extulit, fit tamen duobus diebus progressis; acûs aculeo lens minima eximitur, quæ ungui imposita et halitu oris afflata, in ungue cursitat. Oculis armatis ulterius appareat insectum hoc octo habere pedes, setas quasdam in dorso et acarum esse jam allatum." "Si mater aut nutrix infantem farina cereali, in qua acari sæpissime habitant, adsperserit, infans in ea parte primo et toto tandem corpore scabie laboravit."

In Sweden, Linnæus remarks that the itch-animalcule is named *Klamask*.

Schaeffer also describes the animalcule in his *Elementa Entomologiæ*, in 1766.

Baron de Geer was thoroughly well acquainted with the itch-animalcule, and has left an admirable description of the creature, as well as two excellent figures.[1] The latter, however, are not equal to the description. He points out the error of Linnæus with regard to classification, and expresses his conviction of the identity of acarus scabiei and acarus exulcerans. The specific characters of the acarus scabiei he states to be as follows:

"Acarus subrotundus albus, pedibus rufescentibus brevibus; posticis quatuor seta longissima, plantis quatuor anticis fistulatis capitulo terminatis."

The capitulum in this definition he speaks of as being "en forme de vessie;" and in reference to scabies he observes, "Ces mittes sont même l'unique cause de cette vilaine maladie."

Fabricius,[2] in his *Systema Entomologicæ*, places the acarus in the order *antliata*, which he characterizes as possessing "os, haustello, sine proboscide." The characters of the genus he thus designates:

"*Acarus*.—Haustellum, vagina bivalvi, cylindrica; palpi duo longitudine haustelli." To which, in the amended edition of 1794, he adds, "antennæ filiformes."

With regard to specific characters, Fabricius adopts the definitions of Linnæus, and admits two species as inhabiting the skin of man, namely, the acarus siro and the acarus exulcerans. Of the former he remarks: "Habitat in caseo, farinâ diutius asservatis, cutem hominis rugas secutus penetrat, vesiculum et titillationem excitat. Caussam, nec symptoma morbi esse evincunt observata analogia cum Gallis contagium cura."

And of the latter: "Habitat in scabie ferinâ."

In the *Fauna Grœnlandica*[3] the same author observes, with regard to acarus siro: "Habitat in vesiculâ scabiei Grœnlandorum, qui illum

[1] Mémoire pour servir à l'histoire des insectes. Vol. vii., 1778, p. 94, pl. 5, figs. 12–14.

[2] Johannes Christ. Fabricius. Ed. 1775, p. 813.

[3] Anno 1780, p. 221.

acu apte eximere scientes, mihi miranti, ut vivum animal incedentem ostenderunt. En Grœnlandos Entomologos." "Varietatem farinæ quidem etiam in farina mea vidi : an vero in Grœnlandia domi habeat, incertus sum dum Grœnlandi farinaceis non utuntur." He remarks, also, that in Greenland the animalcule is named "*Okok*," and that in the natural history of Bomares it is termed "*Scab-orm*."

In the *Entomologia Systemica, emendata*,[1] Fabricius adopts the opinion of De Geer with regard to the identity of the acarus siro with the acarus domesticus, or cheese- and meal-mite, and admits the itch-animalcule as a distinct species, with the following characters: "*Acarus scabiei.* Albus, pedibus rufescentibus, posticis quatuor longissima." It is, he continues, "multo minor et distinctus ab acaro sirone." He observes, also, that this species corresponds with the acarus exulcerans, and quotes a passage from Linnæus to the same effect.

Müller, in his *Prodromus Zoologiæ Danicæ*,[2] adopting the early classification of Linnæus, treats of the itch-animalcule under the designation of acarus siro. In Denmark, he observes, the creature is called *Krid-orm*, *Ring-orm*, and *Meel-mid*. The latter term, which, translated, would be *meal-mite*, indicates the popular extension, or possibly the popular origin, of the error of the great Swedish naturalist.

Latreille established the itch-animalcule as a new genus under the name of *Sarcoptes hominis*, with the following description: Body apterous; no distinction of head or segments; manducating organ prominent, without apparent palpi; eight short legs. Subsequently, however, on the occasion of the memorable juggle of Galés, Latreille omitted the genus altogether.

The existence of the acarus scabiei is without question. I have extracted as many as twenty from their retreat at a single sitting. I have placed them on a slide of glass, and seen them run; and after the business of the day has been over, I have examined them with the microscope and found them still active, living for several hours after my examination. I have already stated that I regard them as the unique cause of scabies, and as a necessary feature in the diagnosis of that disease.

When examined with the naked eye the acarus looks white and shining, globular in form, and very aptly resembling the little bladder of water of Bonomo. There is no difficulty in extracting it from the skin; the cuniculus is seen without difficulty; the end of the cuniculus is perceived to be a little raised, while a reddish brown semilunar speck is seen beneath it. As soon as this little eminence of epidermis is lifted, if the end of the needle or pin with which the operation is performed be examined, the minute, white, and shining globe will probably be observed attached to the instrument. If there be no such object, the point of the needle placed again beneath the raised capsule of epidermis will pretty certainly draw it forth. This facility of extracting the little creature is due to its great power of clinging to any object with which it comes in contact.

[1] Anno 1794, vol. iv.

[2] Otho Fredericus Müller. Anno 1776.

When the acarus is seen running upon the surface of a plate of glass, it may be perceived that its anterior margin presents a dusky tint of color, and the examination of this part of the creature with the microscope brings into view a head not unlike that of a tortoise, and a pair of large and strong legs on each side of the head. These organs are encased in a moderately thick layer of chytine, and have consequently the reddish-brown tint of the cases of certain insects, or of the bright part of a thin layer of tortoise-shell. Proceeding with our examination, we perceive the general outline of the animal to be subrotund, the antero-posterior predominating very little over the transverse diameter; the anterior part of the creature being broad, and the posterior somewhat narrower, and semicircular. The ventral surface of the acarus is flat, and occupied by the head and eight legs; the dorsal surface is arched, uneven, and covered by numerous spines; and projecting backwards from the posterior segment of the animal are twelve hair-like filaments, some long and others short.

With the view of determining the size of the acarus, I measured ten specimens, and found them vary between $\frac{1}{147}$ and $\frac{1}{77}$ of an inch in length, and between $\frac{1}{303}$ and $\frac{1}{94}$ in breadth. The following were the measurements of seven of this number:

Length.	Breadth.	Length.	Breadth.
$\frac{1}{147}$	$\frac{1}{192}$	$\frac{1}{88}$	$\frac{1}{109}$
$\frac{1}{128}$	$\frac{1}{303}$	$\frac{1}{77}$	$\frac{1}{100}$
$\frac{1}{119}$	$\frac{1}{147}$	$\frac{1}{77}$	$\frac{1}{94}$
$\frac{1}{94}$	$\frac{1}{143}$		

Examined with a quarter or eighth of an inch object-glass, or with Powell's half inch, the case of the body of the acarus is seen to be composed of narrow plates, variously disposed with regard to the axis of the animal, but chiefly transversely, and resembling a coat of plate armor. The connecting membrane of these plates permits of a certain degree of movement between them. The *dorsum* of the creature is convex, but uneven, and exhibits upon its borders a tendency to division into a thoracic and an abdominal segment, the former being somewhat broader than the latter. Anteriorly the dorsal case terminates in a sharp border, which is scalloped, and forms a jutting roof of protection to the head, and each of the four anterior legs. Posteriorly, the case is somewhat deeply cleft, forming a groove, which corresponds on the ventral surface with the sexual and anal aperture.

The dorsal surface of the creature is covered with tubercles, spines, and hair-bearing tubercles, regularly and very remarkably disposed. The *venter* of the acarus is flat, and the abdominal portion slightly convex. The posterior part of the latter is grooved upon the middle line, and furnished with an anal and sexual aperture, of considerable size.

The *head* is an oblong cylinder, more or less obtusely pointed in front, flattened beneath, enlarging slightly laterally towards the body of the creature, and implanted by its posterior end into the angular interval left by the divergence of the anterior pair of legs. The

lateral enlargement towards the root of the head is the most suitable place for eyes; but I have not as yet been able to detect those organs. The head is surmounted by two rows of stiff hairs. The mouth is an oblong aperture situated upon the under surface of the head, and becoming broad towards the root of the latter. Its borders are furnished with a thick fringe of mandibles, and the interior supplied at each side with a number of strong maxillæ. The head is capable of elongation or retraction beneath the dorsal plate or carapax.

The *legs* are eight in number, four being anterior, and four posterior; the anterior legs are large and powerful, the posterior small. The anterior pair of legs are so large, so closely placed to the head, and directed so immediately forwards, as to deserve the appellation of arms. The next pair follow immediately on the preceding, but are directed outwards. The legs are conical in form, tapering, when extended, to an obtuse point, and composed of a hip-piece and three circular segments. The hip-pieces of the two anterior legs join at an obtuse angle, and form the limit of the root of the head. The point of meeting of these hip-pieces is the commencement of a sternal crest, which runs backwards on the plastrum for a short distance, and terminates by a rounded extremity. A similar crest is formed at each side by the junction of the hip-pieces of the anterior and lateral leg, the crest being directed backwards and inwards towards the termination of the sternal crest. Each of the annular segments of the anterior legs is furnished with three or four bristly hairs, which stand out at right angles from the segment. Moreover, the extremity of each anterior leg is provided with a tubular cylinder [tarsus] as long as the entire leg, and terminated at its extremity by a foot divided on its sole into five lobes.

The head and four anterior legs are covered with a strong case of chytine, which presents the ordinary color of insect cases, namely, a brownish red. The plastrum is slightly tinted with a similar hue, but the three crests formed by the hip-pieces are, in virtue of their thickness, of a deep color. These are the red lines of Gras, Raspail, and others. The posterior legs have but a thin case of chytine, and are less deeply colored. The colored covering of the head and legs contrasts very strongly with the yellowish white of the body of the animal.

The posterior legs spring from the posterior part of the thoracic segment of the animal, two on each side; they are conical in form, composed of three segments, and each leg is connected to the body by means of a triangular and flattened hip-piece. Each posterior leg is terminated by a rudimentary tarsus and foot, and by a long, membranous, hair-like organ, which is directed backwards.

I have already alluded to the cleft on the posterior part of the abdominal segment of the animal, and the papilla which bounds the anal opening posteriorly. A pair of hair-like filaments mounted on short tubercles are found on each side of this opening, near the posterior margin of the abdomen. These four filaments, with the four hair-like organs of the posterior legs, and the four directed backwards from the lateral part of the thoracic segment, form the twelve hair-

like filaments which are observed along the posterior margin of the animal. These filaments, together with the hairs, spines, and tubercles situated on the dorsum, serve most effectually to prevent the retrogression of the acarus along its cuniculus, while the anterior part of the creature is equally well organized for advance.

I have not been able to distinguish any sexual differences between the animals I have examined. In a sketch before me is drawn a conical projection in this region, but I have not as yet seen that appearance repeated.

The ova I have seen; and I have preserved a slide, on which there are two of these bodies.

The internal organization of the animalcule is obscured by the large collection of adipose cells which form its superficial stratum.

HISTORY AND DESCRIPTION OF THE STEATOZOON FOLLICULORUM.

In the course of some researches directed to the investigation of the cause of acne, Dr. Gustav Simon, of Berlin, discovered an animalcule in the sebaceous substance with which the hair-follicles are so commonly filled, particularly on the face, and gave it the designation *acarus folliculorum*.[1] Dr. Simon's researches have hitherto been directed principally to the cutaneous follicles of the nose, where he finds the parasite with astonishing frequency, even in cases where the skin presents all the characters of ordinary health. Of living persons, he detected the animal in three out of ten men in the sebaceous matter squeezed out by pressure from the follicles; but in the dead he discovered them in almost every individual examined, the only exceptions out of ten bodies being two newly-born children. The mode of examination in the case of the dead was by means of thin sections. The animalcules imbedded in the sebaceous matter are found in the hair-follicles near the outlet, their long axis corresponding with that of the follicle, and their heads being directed inwards; in four instances, the head and part of the body of the little creature were lodged in a sebiferous duct. In normal hair-follicles they are usually not more than one or two of these parasites; in rare instances, three or four; but where the sebaceous substance is concreted, their number varies from two to six; in one case he found as many as eleven, and in another thirteen. They are tardy in their movements, but retain their vitality for a considerable length of time; thus Dr. Simon found them moving after a confinement of eight and twelve hours between two plates of glass, and in one body they were found alive after the person had been dead for six days.

The animalcule presents several forms, which correspond with stages of development. In the most common form, the creature varies from 0.085 to 0.125 of a line (German) in length, and 0.020 of

[1] Müller's Archiv., 1842, p. 218. Ueber eine in den kranken und normalen Haarsäcken des Menschen lebende Milbe.

a line in breadth; it has an elongated figure, a long thoracic portion, with four pairs of legs, and an abdomen three times as long as the thorax, and tapering gradually to an obtusely-pointed extremity. The head consists of two large palpi, and a proboscis situated between the two. The *palpi* are bi-jointed, and terminated by several small teeth-like processes. The *proboscis*, which is capable of elongation and retraction, resembles a long tube, upon which lies a triangular organ, having its narrow base directed towards the root of the former, and extending by its apex almost to the extremity of the proboscis. This triangular body consists of two bristles, lying side by side. The *head* is continuous directly with the thorax, without any precise line of demarcation. The *legs* are short, conical, and composed of three segments, and upon the latter is an appearance of plaits. The leg is terminated by three claws, one long, the other two short. From the anterior part of the basis of each leg a double line runs transversely inwards across the under surface of the thorax, towards the middle, where one of the lines passes forwards and the other backwards, serving together to form a central longitudinal double line. The transverse lines are probably continued completely around the thorax. The thorax is highest at about the middle, and broadest at the point corresponding with the second pair of legs. The *abdomen* is marked by a number of transverse lines produced by a series of grooves or contractions, which give the margin a resemblance to a file. The contents of the abdomen are granular, and similar to those of pigment cells, and among these granules are several large transparent spots of a round, oval, and sometimes quadrate form, like globules of oil. The tail is free from granules.

A second form was remarkable from having the abdomen once only, or one and a half times longer than the thorax. The abdomen is more or less obtusely pointed posteriorly, and marked by the characteristic transverse lines.

In a third form, the abdomen is very short and acutely pointed. The thorax is broad, and there are no transverse lines on the abdomen.

In a fourth form, the whole animal is remarkable for its slender figure; the abdomen is very long; there are only three pairs of legs, no transverse lines on the abdomen, and its granular contents are more lightly tinted.

To what part of the animal kingdom does the parasite belong? asks Dr. Simon; and this question he refers to an eminent entomologist of Berlin, who returns him the following answer: The animal is clearly not an Helminthus, but its entire organization, and especially the great distinctness of its different pairs of legs, betoken it to belong to the great division Insecta, of Linnæus. Of this extensive group, the parasite before us appertains to the class Arachnida, for there is no separation between the head and thorax, there are no antennæ, and it has four pairs of legs. Judging from the form of its mouth it should belong to the order Acarus. The proboscis is the under lip lengthened out, a form which this organ assumes in all mites. The two bristles lying on the proboscis are the mandibles, and the pair of two-jointed organs lying by the side of the proboscis are the maxillary

palpi. The different forms in which the creature has been seen are stages of development. In the early state of the mite, the presence of three pairs of legs is a common character. The lengthened form here principally described is the second stage of development, and those with shorter abdominal segments represent later periods. It is therefore probable, that in the fully developed stage, the abdomen is lost altogether, and we are inclined to believe that this last stage is not as yet known to observers. The distinctions of genus and sex are, consequently, not yet practicable.

In general, such a metamorphosis as the one here described does not occur in the mite, for these creatures retain the form, even although an additional pair of legs have to be developed, which they possessed on first breaking from the egg. On the other hand, Hartig has observed and described in the mite of the pinegall (*Oribata geniculata*, Latreille) a metamorphosis precisely analogous to that of the animalcule before us.

These animalcules cannot be metamorphosed into parasitic mites, for the itch-mite and mange-mite have distinctly segmented legs with joint-lobes (Heftläppchen), and no metamorphosis, since they issue from the egg already provided with four pairs of legs. Earlier, some relationship might have been inferred between this animalcule and the bird-mite (Dermanyssus), which, in its young state, has only six legs; but the worm-like form of our animalcule in its early stages, and the remarkable shortness of its legs, render comparison between them impossible.

The animal found by Donné in the mucus of the vagina (Trichomonas vaginalis), which this observer considers to belong to the Infusoria, and, according to others, is more nearly related to Acarus, differs in many points, according to Donné's description and figure, from the acarus of the hair-follicles. For instance, it is often not more than double the size of a blood-corpuscle, and at most $\frac{1}{100}$ of a line long; it has a round or elliptic-shaped body, with a whip-like appendage in front, and along one of its sides several fine fibres.[1]

Again, as the animalcule of the hair-follicles has not yet, as we conjecture, been seen in its perfect shape, it is possible, although little probable, that this last stage of development may correspond with some already known mite. In no case, however, could the animalcule, for the before-mentioned reasons, become one of the ordinary parasites of the human skin; but this creature must present the remarkable peculiarity of living within the human body in its young state, and in its perfect state of living external to it. Further researches may serve to establish this question; in the meantime, however, I will designate this animal, from its habitat in the hair-follicles, *acarus folliculorum*.

About six times have I seen, both in the comedones of living per-

[1] The trichomonas vaginalis, with which I am well acquainted, bears no resemblance whatever to the steatozoon folliculorum. The trichomonas is a globular sac, slightly drawn out to a point, and having connected with this point a flexible and mobile pedicle, which acts the part of a sucker. The sac measures about $\frac{1}{2000}$ of an inch in diameter. I have not seen Donné's figure.

sons, and in the hair-follicles of the dead, a heart-shaped body, having a small process projecting from its broader end. This body was somewhat longer than the breadth of the animal, of a brownish color, and appeared to be filled with a granular substance. In the hair-follicles it was always close to the animalcule, but not connected with the latter. This observation, with the fact of the non-resemblance of the heart-shaped body to any known human structure, gives strength to the conjecture that it must bear some relation to the acarus. It might, for example, be an egg-shell, out of which an embryo has escaped.

In reference to the movements of the creature I have been able to make the following observations: The palpi are capable of being moved in different directions, of being drawn in and stretched out. The latter movements are remarked also in the proboscis, which is sometimes thrust beyond the palpi, and sometimes drawn back. The legs can also be moved in various directions, and the creature is often seen to move them backwards and forwards, like a pendulum; they can also be retracted or stretched forth. The thorax and body admit of being curved. Although the creature makes all these movements, it does not walk, but merely changes its position from side to side; once, indeed, I saw an acarus walk a distance equal to his own length, but then it was along a hair, which he closely grasped.

Dr. Simon remarks, that he saw the first and second described forms most frequently, and the third and fourth forms, namely, that with the short and pointed abdomen, and the slender animal with three pairs of legs, only rarely; the former in the proportion of ten per cent., the latter six per cent. But he feels so convinced of the accuracy of his observation, that he regards as the most positive of his data, the presence of six legs only in some.

After perusing the account of the steatozoon folliculorum, as given by its discoverer, Dr. Simon, I determined to proceed to a verification of his discoveries, and being provided with an instrument probably superior to that employed by Dr. Simon, I have succeeded in making out certain points of structure that had escaped his observation.

I was not long in obtaining subjects; almost every face I met supplied me with abundance; and the difficulty seems to be, not to find the creature, but to find any individual, with the exception, according to Dr. Simon, of newly-born children, in whom these animalcules do not exist. It is by no means necessary to commence our search by selecting an acne punctata, or even a comedo; almost every collection of sebaceous substance which can be squeezed forth from the numberless cutaneous apertures upon the nose, the forehead, the face, and probably from other parts of the body, will furnish subjects. Moreover, Dr. Simon has observed that the parasites are situated near the mouth of the follicle; consequently that portion of sebaceous substance which is squeezed out with the least force is the part which is most likely to be inhabited by the animalcule.

The steatozoon folliculorum would seem to give rise to no uncomfortable effects by its presence, unless, perchance, it should multiply to such an extent as to become a source of irritation to the follicle, a

supposition which Dr. Simon admits, for it is found in persons whose skin is perfectly healthy and clear, and in whom no signs of cutaneous irritation are present. These animalcules undoubtedly feed on the sebaceous substance in which they lie imbedded, and which is the cause of their existence. I have commmonly found two in the small mass of this substance expressed by the fingers, often four and five, and in one instance eight, closely held together. Hitherto I have confined my examination to living persons, having levied for contributions among my more intimate friends, and have not as yet had recourse to a skin studded with acne.

In the course of my investigations I have examined several hundreds of these animalcules, and have seen all the forms described by Dr. Simon; I have also had the good fortune to discover the embryo and the ovum. I cannot, however, agree with Dr. Simon with regard to the phases of development which he imagines to indicate perfection or growth; on the contrary, I am inclined to believe the most common to be the most mature form, and the third or most perfect of Dr. Simon, an embryonic form. The following are the extremes of measurement of the perfect animal in fractions of an English inch, according to my examinations:

Entire length.	Length of abdomen.	Breadth of thorax.
$\frac{1}{135}$	$\frac{1}{227}$	$\frac{1}{555}$
$\frac{1}{64}$	$\frac{1}{88}$	$\frac{1}{355}$

The animal is divisible into a head, a thorax, and abdomen, the whole of these parts being well and distinctly marked.

The *head* represents in form a truncated cone, flattened from above downwards, and directed obliquely downwards from the anterior part of the trunk. It is composed of two large lateral organs termed by Simon maxillary palpi, and of an intermediate triangular organ. The *maxillary palpi* constitute the most considerable portion of the head. Each is composed of three segments, and furnished with a prehensile extremity, consisting of three curved finger-like organs, or claws. The first segment of the maxillary palpus is large and long, the two succeeding segments are smaller, and in every respect resemble the segments of which the legs are composed. Indeed, these maxillary palpi perform the office of arms, the first segment being fixed, the next two bending downwards under the first, or being stretched directly forwards. It is this flexion and extension of a jointed organ that Dr. Simon mistook for extension and retraction. On the under part of the first segment of the maxillary palpi I have observed a circle, which appears to me to bear some resemblance to an eye; upon this point, however, I am not perfectly satisfied.

The *triangular organ*, which includes the mouth of the creature, is composed of three elementary parts, namely: 1. Of a triangular process, a prolongation of the membranous case of the animal from the neck along the middle line of the upper surface of the head, to the extremity of the latter, where it curves downwards, and in the latter situation consists of two parallel pieces placed side by side. 2. Of a funnel-shaped and tubular organ, or sucker, occupying a central posi-

tion with regard to all the other cephalic organs. 3. Of another triangular narrow process, situated on the under part of the head, and composed of two lateral pieces.

Fig. W.

Fig. X.

Fig. Y.

Fig. W.—The steatozoon seen upon its ventral surface. The structure of the head, feet, and plastrum is shown, as well as the annulate character of the abdomen. The figure is drawn to a scale of a line to the 1-2500th of an inch.

Fig. X.—The steatozoon viewed upon its dorsal aspect. The head is retracted within the thorax.

Fig. Y.—The steatozoon viewed upon its lateral aspect. The serration of the abdominal segments is somewhat exaggerated in all the figures.

The head is connected to the anterior segment of the thorax by a loose membrane, marked on its surface by transverse lines, which indicate its susceptibility of being thrown into folds. This membrane is intended to admit of the retraction and extension of the head, and by its means the entire head may be drawn in and buried deeply beneath the level of the membranous fold here described, so that the head is entirely lost to view, and the animal looks decapitated, the fold of the cervical membrane forming a perfectly straight border in front. This is a peculiarity in the structure of the animal which has been passed over by Dr. Simon; he makes no allusion to any such power, and he undoubtedly would have done so had he observed it, for the effect of the retraction is too remarkable not to be instantly recognized. In fact, when an animalcule is alternately retracting and extending its head, the impression to the eye of the observer is that of a creature one while furnished with a well-defined head, and the next instant decapitated back almost to the level of the anterior seg-

ment of the thorax. The appearance presented by the animal during the retraction of its head is represented in the wood engraving, fig. X.

The movements of the maxillary palpi are flexion of the last two segments, the first segment appearing to be firmly connected with its fellow of the opposite side, and being very limited in its movement of flexion. The extension of these segments upon the first has led Dr. Simon to infer that the palpus might be pushed out, and the sudden disappearance of these two segments by flexion underneath the first, has induced him further to believe that they might also be retracted. It might be imagined, that when the creature is seen from its under surface, this error would become immediately apparent; but that is not the case; for the foreshortening exhibited in the latter view only tends to increase the deception. The three finger-like claws at the extremity of the palpus are also capable of motion, and grasp upon any object within their reach. The triangular pieces, both of the upper and lower part of the head, move upwards and downwards on each other, and at the same time separate laterally to a slight extent.

The *thorax*, which is the broadest and thickest part of the animal, and somewhat tun-shaped, is flattened on its under surface. It is composed of four broad segments, which are joined by a connecting membrane on the dorsum and sides of the creature, but are continuous inferiorly with the broad and strong plastrum which covers the whole inferior surface of the thorax. The segments are somewhat convex in their antero-posterior diameter, particularly at the upper part, so that the outline of the chest in this situation has the appearance of being slightly fluted. The anchylosis of the four segments composing the plastrum is marked by four transverse markings, consisting each of two ridges, which correspond peripherally with the interspaces between the legs and centrally bifurcate, one passing forwards to unite with the line in front, the other passing back, to become continuous with that behind. The same arrangement takes place on the opposite side, and a sternal line, consisting of a double crest, is consequently formed. The ridges of the plastrum here described being thicker than the rest of the covering of the animal, are strongly and characteristically marked.

The segmented structure of the thorax permits of a certain degree of movement in this part of the creature.

The *legs*, which are eight in number, are connected with the sides of the plastrum, eaah segment of the thorax sustaining one pair of these organs. They are conical in figure, the base of the cone being broad, and its apex obtusely truncated, and furnished with three finger-like claws. Each leg is composed of three segments, of a proximal segment, which is large, and almost triangular in form, the base of the triangle (scalene) being directed forwards, and two smaller, cylindrical segments, the distal segment supporting the three finger-like organs above noted. The legs are all of the same size.

The movements of the legs are a forward and a backward movement, the two small segments forming an acute angle in their bend forwards upon the proximal piece, and being extended directly backwards when the extension is completed; so that, when the creature advances its leg, and places it on a flat surface, the two small segments are directed

forwards, and, by their under side, rest upon the ground, together with the foot, like the long hind-foot of the rabbit; then, clutching upon some object within reach, the segments are carried backwards, until they form a straight line with the axis of the proximal piece. By this movement, an enormous power of propulsion is gained by the creature, and it moves forward with considerable force. Dr. Simon remarks, that the animal performs a swimming movement with its legs, but without making any advance. That observation may, I think, be explained, by its compression, however slight, between two plates of glass; by the injury the animal has received in being pressed from the hair-follicle along with the sebaceous substance; and by the fact of the glass upon which it attempts to walk affording no rough points to which it can attach itself. The legs are very irregular in their movements.

The *abdomen* is somewhat variable in point of length, but generally more than two or three times longer than the thorax. It is flattened on its under surface, and convex above, and tapers gradually from its base to its extremity, where it terminates in a rounded point. It is composed of a series of extremely narrow annular segments, which overlap each other from before backwards. When examined on either surface, the margins of these segments present the appearance of a regular succession of transverse lines; and when seen along the outline, they give it the character of a serrated edge. The extremity of the abdomen is sometimes lengthened out into a small pointed process. The aperture of the anus is seen on the under surface of the abdomen, near its extremity.

The annulated structure of the abdomen which is here described, permits it to move with considerable freedom, and to curve in any direction.

Of the *internal structure*, Dr. Simon says nothing more than that the abdomen is filled with granular contents, and exhibits several large and irregular vesicles, which he compares to oil-globules. The granular matter of Simon is cellular tissue in its most simple form; with a good object-glass, the cells are quite distinct, and appear to be filled with adipose fluid. These cells are variable in point of size, some being exceedingly minute, and others of moderate bulk; they are assembled in such considerable number in the abdomen, as to give it a dark appearance, and forming a thin stratum on the inner surface of the integument, they obscure the alimentary canal. Sometimes the cells are confined to the abdomen, but more frequently they extend into the thorax, forming a narrow line, that may be traced almost as far as the head. By careful examination, I have succeeded in distinguishing the muscular fasciculi which move the legs, and a broad œsophagus. In the abdomen I have traced also the outline of an alimentary canal, and have seen it terminate by an infundibuliform extremity at the anus. The transparent cell-like organs seen in the abdomen of the perfect animal, I regard as dilatations, or convolutions of the alimentary canal; and a dark, brownish mass in the commencement of the abdomen I consider to be the liver. I have been unable to discover any sexual differences in the numerous examples which I have examined.

CHAPTER XXV.

SELECTED FORMULÆ.

Solutio solventis mineralis; De Valangin; vel, Liquor acidi arseniosi hydrochlorici.

℞.—Acidi arseniosi, ... gr. xxx.
Acidi hydrochlorici, ... gr. xc.
Aquæ destillatæ, ... ℥xx.

Dissolve the arsenious acid in the hydrochloric acid diluted with one ounce of the distilled water; then add the rest of the water. This solution contains one grain in a little more than five drachms, consequently is somewhat less than half the strength of Fowler's solution, which contains one grain in two drachms.

Mistura acidi arseniosi hydrochlorici.

℞.—Solut. solventis mineralis, De Valangin, . . . ℥ij. ℈ij.
Acidi hydrochlorici diluti, ... ℥j. ℈j.
Syrupi simplicis, ... ℥iss.
M.

A drachm to be taken in an ounce of water, with meals, three times a day.

Mistura hydriodatis hydrargyri et arsenici.

℞.—Liq. hydriodatis hydrargyri et arsenici, Donovani, . ℥ss.
Syrupi simplicis, ... ℥iss.
M.

A drachm to be taken in an ounce of water, with meals, three times a day.

Mistura ferro-arsenicalis, infantibus.

℞.—Vini ferri,
Syrupi simplicis, ... āā ℥ss.
Liquoris potassæ arsenitis, ... ♏ xxxij.
Aquæ anethi, ... ℥j.
M.

A drachm to be taken, with meals, twice or three times a day. Each drachm contains two minims, and may be increased to three or four minims if found desirable.

Mistura ferro-arsenicalis.

℞.—Vini ferri, ... ℥iss.
Syrupi simplicis,
Liquoris potassæ arsenitis, ... āā ℥ij.
Aquæ destillatæ, ... ℥ij.
M.

The dose of one drachm contains somewhat less than four minims, and may be administered three times a day; either with or directly after meals.

Mistura olei morrhuæ cum arsenico.

℞.—Olei morrhuæ, ... ℥ij.
Vitelli ovi, ... no. j.
Liquoris potassæ arsenitis, ... ♏ lxiv.
Syrupi simplicis, ... ℥ij.
Aquæ destillatæ, ... q. s. ad. ℥iv.
M.

A drachm to be taken with, or directly after meals, three times a day; for infants.

Pulvis sodæ arseniatis.

℞.—Sodæ arseniatis, ... gr. j.
Sacchari albi, ... gr. xlviij.
Misce bene, ut fiat pulvis; et divide in chartulas xxiv.

One to be taken three times a day with meals; the powder to be placed on the tongue; for infants. The dose for adults should be $\frac{1}{12}$ or $\frac{1}{8}$ of a grain.

Pilulæ sodæ arseniatis, compositæ.

℞.—Sodæ arseniatis, ... gr. ij.
Solve in aquâ destillatâ, q. s.
Pulveris antimonii oxysulphureti, ... gr. xxiv.
Pulveris guaiaci, ... gr. xlviij.
Mucilaginis acaciæ, q. s.
Misce bene, et divide in pilulas xxiv.

One to be taken, with meals, three times a day.

Pilulæ arsenici, quinæ, et ferri.

℞.—Sodæ arseniatis, ... gr. ij.
Quinæ disulphatis, ... gr. xij.
Ferri sulphatis, ... gr. vj.
Extracti anthemidis, ... ʒj.
Misce bene, et divide in pilulas xxiv.
One to be taken, with meals, three times a day.

Pilulæ quinæ arsenitis, compositæ.

℞.—Quinæ arsenitis, ... gr. x.
Antimonii oxysulphureti, ... ℈j.
Pulveris guaiaci, ... ʒj.
Mucilaginis acaciæ, q. s.
Misce bene, et divide in pilulas xxiv.

One to be taken, with meals, three times a day.

Pilulæ asiaticæ.

℞.—Arsenici protoxydi, ... gr. lv.
Piperis nigri, ... ʒss ix.
Asclepiadis giganteæ radicis corticis, ... ʒiv. ℈iv.
Misce bene, ut fiat pilulas 800.
For mode of preparation and exhibition of these pills, see page 367.

Unguentum oxydi zinci, benzoatum.

Bell's Formula.

℞.—Adipis preparatæ, ... ℥vj.
Gummi Benzoini pulveris, ... ʒj.
Liquefac, cum leni calore, per horas viginti quatuor, in vaso clauso; dein cola per linteum, et adde,
Oxydi zinci, purificati, ... ℥j.
Misce bene, et per linteum exprime.

Unguentum oxydi zinci benzoatum cum spiritu vini.

℞.—Unguenti oxydi zinci, benzoati, ... ℥ij.
Spiritûs vini rectificati, ... ℥ij.
Misce, ut fiat unguentum.

Instead of spirits of wine, spirits of camphor, distilled glycerine, liquor plumbi diacetatis, Peruvian balsam, or the juniper tar ointment, may be combined with the benzoated ointment of oxide of zinc, in the same proportion as above, one drachm to the ounce.

Unguentum picis juniperi.

℞.—Olei juniperi pyrolignici,[1] . . . . . ℥j.
Sevi ovilli purificati, ... ℥vj.
Adipis purificatæ, ... ℥ij.
Liquefac cum leni calore et agita bene ut fiat unguentum.

This ointment may be used of the above strength, or diluted in any suitable degree.

Unguentum sulphuris hypochloridi, compositum.

℞.—Sulphuris hypochloridi, ... ℥ij.
Potassæ subcarbonatis, ... gr. x.
Adipis purificatæ, ... ℥j.
Olei amygdalæ essentialis, ... ♏x.
Misce bene, ut fiat unguentum.

Unguentum sulphuris et picis.

For ringworm, Wilkinson.

℞.—Sulphuris sublimati,
Picis liquidæ,
Adipis purificatæ, ... āā ℥ij.
Cretæ preparatæ, ... ℥j.
Ammoniæ hydrosulphureti, ... ℥ss.
Misce, ut fiat unguentum.

Unguentum sulphuris cum oleo laurino.

For ringworm, Dr. Walter Dick.

℞.—Olei laurini, ... ℥iss.
Sulphuris vivi, ... ℥ss.
Pulveris camphoræ, ... gr. x.
Misce bene, ut fiat unguentum.

Unguentum stimulans.

℞.—Pulveris cantharidis, ... ℥vj.
Adipis purificatæ, ... ℥iij.
Macera, cum leni calore, per horas viginti quatuor, et, per chartam bibulam, cola.

This ointment is too strong for use in its present state, and when required as a stimulating remedy should be reduced by means of any agreeable pomatum [adeps odorata], in the proportion of one part of unguentum stimulans to four or eight of the diluting medium.

Unguentum trichogenosum.

℞.—Unguenti stimulantis,
Butyri cacaonis theobromatis, ... āā ℥ij.
Butyri jasminæ, ... ℥ss.
Adipis odoratæ, ... ℥j.
Misce bene, ut fiat unguentum.

To be well rubbed among the roots of the hair, daily, after thorough brushing.

Unguentum trichogenosum, Dupuytren.

℞.—Purified beef marrow, ... ℥j.
Acetate of lead, ... ℥j.
Peruvian balsam, ... ℥iij.
Tincture of cantharides, ... ℥j.
Essential oil of cloves and canella, . . . āā ♏xv.
Misce bene, ut fiat unguentum.

Unguentum trichogenosum, Gibert.

℞.—Purified beef marrow, ... ℥vj.
Oil of sweet almonds, ... ℥ij.
Powder of cinchona bark, ... ℥j.
Misce bene, ut fiat unguentum.

[1] The Huile de Cade is an impure oleum juniperi pyrolignicium.

Lotio capillaria stimulans.

℞.—Olei amygdalæ dulcis, ... ℥j.
Liquoris ammoniæ fortius, ... ℥j.
Spiritûs rosmarini, ... ℥iv.
Aquæ mellis, ... ℥ij.
Misce, fiat lotio.

Lotio capillaria refrigerans.

℞.—Olei amygdalæ dulcis, ... ℥ss.
Sodæ biboratis, ... ℥j.
Aquæ florium aurantii, ... ℥iss.
Aquæ destillatæ, ... ℥vj.
Misce, fiat lotio.

Lotio hydrargyri bichloridi, ex Emulsione amygdalarum.

℞.—Amygdalarum amarum, ... no. xx.
Aquæ destillatæ, ... ℥vj.
Contunde et tere simul dein cola et adde,
Hydrargyri bichloridi, ... gr. xvj.
Spiritûs vini rectificati, ... ℥ij.
Misce, ut fiat lotio.

Tinctura crotonis tiglii.

℞.—Seminum contusorum, ... ℥j.
Spiritûs vini rectificati, ... ℥iv.
Macera per dies quatuordecim et cola.

A valuable cutaneous stimulant.

Solutio ætherialis iodinii et mastiches.

Dr. Thomas Smith Rowe.

℞.—Spiritûs vini rectificati, ... ℥v.
Ætheris sulphurici, ... ℥iij.
Misce; et adjice,
Gummi mastiches, ... gr. xxv.
Solve et cola, dein adde,
Iodinii, ... ℈ij.
Fiat solutio.

This solution will be found to be a valuable application for scrofulous tubercles and eruptions, and for the tubercular forms of lupus and elephantiasis. The mastich forms a varnish-like film on the skin, which detains the iodine, and facilitates its absorption.

Adeps benzoata.

℞.—Adipis purificatæ, ... ℥vj.
Gummi benzoini, pulveris, ... ℥j.
Tere simul, dein liquefac cum leni calore, per horas viginti quatuor, in vaso clauso, et cola per linteum.

This ointment, which, with the addition of oxide of zinc, is the benzoated zinc ointment, may be used alone, or combined with other substances; or, it may be used with advantage to dilute other ointments, tending to preserve them from rancidity, as well as communicating an agreeable odor.

Note.—Since the above formulæ were in print, my attention has been called to the liquor arsenici chloridi of the London Pharmacopœia; which corresponds with the liquor acidi arseniosi hydrochlorici, de Valangin, and may be taken as a proper substitute for it, but is somewhat stronger, containing about (somewhat less) one grain of arsenious acid in four drachms. The liquor arsenici chloridi is consequently less than half the strength of the liquor potassæ arsenitis, which contains two grains and a half in four drachms. Therefore, taking the standard dose of the latter at *five* minims, the dose of the liquor arsenici chloridi should be *ten* minims.

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