

of ligature of the artery, recovery occurred 40 times and improvement 13 times, while the condition remained unchanged in 16 cases. Some physicians, however, starting from the idea that elephantiasis is produced in the main by nutritive disturbances, have decided upon attacking the sciatic nerve instead of ligaturing the femoral artery. Morton¹ reports a case of this kind, in which, after ligature of the iliac artery had been useless in an elephantiasis of the right lower limb lasting fourteen years, a retrogression of the disease ensued within six weeks after the excision of a portion of the sciatic nerve, and the limb diminished to half the previous volume. A communication has been made very recently, which emphasizes the favorable action of the constant current in the treatment of elephantiasis. Drs. Moncorvo and Silva Arango, of Rio Janeiro,² have treated cases of elephantiasis for a long time with a strength of current of six to sixty elements, and have aided the liquefaction of the masses of tissue by occasional applications of the induced current. The treatment was attended with remarkable success, but extended occasionally over one to two years.

¹ Arch. of Dermat., 1880, p. 299.

² Journal de Thérapeutique, 10 Janvier, 1882.

ANOMALIES OF THE EPIDERMIS.

PART I.

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ICHTHYOSIS.

ICHTHYOSIS is due to a congenital predisposition of the skin to develop epidermis in excess, and according as the skin as a whole is affected over a larger or smaller area, or only the epithelial lining of the follicles, it is known as ichthyosis diffusa and ichthyosis follicularis.

In some cases, the tendency to excessive epidermal formation manifests itself at a comparatively early period of intra-uterine life, and the disease then assumes appearances quite at variance with those ordinarily met with. This last group is called ichthyosis congenita.

Ichthyosis diffusa is by far the commonest form. The so-called varieties of ichthyosis diffusa are only the various stages and degrees of intensity of the same malady.

When the disease manifests itself most mildly, only the normal furrows and rugæ of the skin are somewhat more than ordinarily developed. The epidermis is somewhat thickened, but scaly formations are absent, although the normal desquamation is slightly increased. The skin has a wrinkled appearance, feels brittle and harsh and dry (xeroderma and dry skin of English writers). Hardened masses of the epithelium now developing in excess, the epidermal layer loses its integrity, and scales are formed. The furrows between the larger and smaller scales correspond exactly with the normal furrows of the skin.

As extensive areas of the skin are affected, and these look like the skin of a fish or a snake, this variety has led to the use of the term ichthyosis (ichthyosis serpentina or cyprina). When not developed in abundance, the color of the scales is a bright, pearly whiteness (*I. nitida*, nacrée, Alibert). When more abundant, their color is always darker, assuming a greenish-blackish hue. As the skin affected is also darker, and gran-

ular pigment is often seen in the scales, there can be no doubt that this discoloration is caused by an extra development of pigment. The scales adhere quite firmly, especially at the centre, but can usually be removed without giving rise to any bleeding, *i. e.*, without injuring the papillæ.

In its severest forms, irregularly shaped hillocks of scales are developed, separated by deep furrows from one another, which even here correspond to the normal furrows of the cuticle. As in health, these furrows are most marked about the joints. Passage of the hand over the surface or the movements of the patient produces a noise by the rubbing of the hillocks against one another, and this has been compared to the rattle of the rattlesnake. As extreme pigmentation of the skin occurs in severe cases, the scales present a dark-green to almost black color. Large masses of scales are thrown off, and are found in the patient's bed and clothes (ichthyosis cornea or hystrix, or hystricismus).

Localization.—Ichthyosis presents a very marked preference for certain parts of the body, particularly the extensor aspects of the limbs and, in them, the corresponding aspects of the joints. In the slight grades, the first formation of scales occurs upon the extensor aspect of the knee and elbow joints. The disease may extend over the whole surface of the body, but then the affection is most pronounced in the regions just named. Some places remain more or less unaffected, and these are to a less extent the flexures generally, but especially the soles of the feet and the palms of the hands, the genitals and the face. However, Schmidt¹ reported a case in which the entire surface was affected, with the exception of the face and upper region of the chest. The face is the only region of the body that has not been seen to be affected with ichthyosis diffusa. It is quite peculiar that even in the severest forms of ichthyosis the line of demarcation between healthy and diseased skin is abrupt.

In a series of cases, otherwise like those just described, the disease is present only on the palms of the hands and soles of the feet, the skin elsewhere remaining normal. In the milder cases, the epidermis of the palms and soles is only thickened, showing a moderate amount of epithelial exfoliation, and here and there a fissure. But its origin soon after birth, and the absence of external influences such as manual labor, etc., and above all its hereditary character, settle the diagnosis. Of course, manual labor will aggravate the disease, but when it is desisted from, the malady returns to its former state. This is easily explained from the fact that the formation of callus is favored by the existence of ichthyosis. In other cases, true horny excrescences are developed after the manner of ichthyosis cornea. A case of this kind affecting the soles of the feet has been described by Ernst.² In another case reported by Boegehold,³ besides the very considerable development of scales on the palms and soles, there was but slight epidermal thickening over the knees. I have observed the importance of heredity in these, as in the ordinary cases, in one instance in which, in a mother and son, the disease manifested itself soon after birth, was aggravated by manual labor, but did not disappear entirely when no manual work was done. More instructive in this respect is the family described by Thost⁴ in which ichthyosis palmaris et plantaris was transmitted through four generations.

Anatomy.—It has been demonstrated that the ichthyotic scales consist of firmly coherent hardened epidermal cells, their long axis running parallel with the surface of the

¹ "Descriptio Ichthyosis cornæ," Bremen, 1830.

² "De Corneis humani corporis excrescentiis," Diss. Berlin, 1819.

³ Virch. Arch., Bd. 79, S. 545.

⁴ "Ueber erbliche Ichthyosis palmaris et plantaris," Diss. Heidelberg, 1880.

skin, partly meeting the interpapillary furrows at a more or less acute angle. Between the lamellæ of the cuticle is found granular pigment in abundance, which normally is of rare occurrence. Sections of ichthyotic skin, apart from the frequent marked pigmentation and enlargement of the interpapillary cones, show that the horny layer has been very much thickened, whilst the deeper layers have undergone no essential change. The enlargement of the interpapillary cones is consequent upon hypertrophy of the papillary bodies. The hair-follicles often show indentations, and those familiar epithelial outgrowths from the point of insertion of the mm. arrectores pilorum, as seen in a number of other chronic skin diseases. Not rarely cystic formations originating in the sudoriparous and sebaceous glands have been observed. The *papillæ* are markedly elongated, but without any dendritic branching; and both in the course of the blood-vessels and in their walls, pigment granules in great number are found. Excepting the pigmentation of its superficial layers, the corium exhibits no pathological alteration.

Chemical analysis of the scales has shown a considerable increase in their inorganic constituents, especially in silicic acid.

Etiology.—Scarcely any other skin disease affords such direct proof of its hereditary nature as ichthyosis. Hardy goes even so far as to assert that if other members of the family are not found affected with ichthyosis, this disease will certainly be found affecting some near friend of the patients. There are many instances on record where the disease was transmitted from mother to son, and from father to daughter, although usually transmitted to those of like sex. Its frequent occurrence in brothers and sisters, without any external influences being recognized, is further proof of the hereditary nature of ichthyosis.

It was formerly supposed that *males* were more often than *females* the victims of this disease, but later observations fail to detect any such difference. With one exception, soon to be mentioned, race and climate have no genetic influence on the disease. Ichthyosis occurs endemically, according to a number of trustworthy observations. Buffon¹ reports it as being endemic in Paraguay. This is more marked in the Indian Archipelago, especially on the Molucca Islands,² where it affects five per cent of the entire population. Its hereditary nature is very evident in these localities. Males are affected almost exclusively. I do not think that its endemic occurrence is due to climatic peculiarities, but is attributable to its hereditary nature, and this the more so, because of its occurrence among a people living in isolated regions, usually islands.

Course.—Those afterwards affected with ichthyosis, are always born as perfectly normal children. The first evidences of the disease rarely appear before the end of the second month and then on the extensor surfaces of the extremities, especially of the knees and elbows. In the majority of cases, however, the disease manifests itself in the course of the first or second year of life. The further course of ichthyosis depends upon its intensity, and the maximum of development is attained usually about the time of puberty. Its maximum degree of development once attained, ichthyosis remains stationary throughout life, apart from slight fluctuations. Cases of actual recovery are among the rarest of exceptions. I know of only two such cases which were reported by Hebra.³ In one instance, the ichthyosis disappeared after an attack of measles, in the other after variola. Its transient disappearance, particularly after severe general disease, has often been seen. In many patients a shedding process of the epidermis takes place, especially

¹ Cit. by Willan, "Die Hautkrankh. u. ihre Behandlung," Breslau, 1816, S. 149.

² Hirsch: "H'db. d. hist. geogr. Path.," I. Aufl., B. ii., S. 470.

³ Hebra and Kaposi: "Lehrb. d. Hautkr.," Ed. ii., S. 42.

towards the end of summer, leaving the skin temporarily with a more or less normal appearance. Ichthyosis has no effect on the general health of the patient.

Prognosis.—Concerning the general health the prognosis of ichthyosis is good; but the local malady is incurable. The cases reported as recoveries due to medication were in all probability incorrectly diagnosed. Mild grades are of little importance, excepting the possibility of their further extension. The intenser forms, however, are quite serious, because of the deformity and impeded movement they occasion when certain regions are affected, and the painful rhagades common to them.

Diagnosis.—It might possibly be mistaken for Kaposi's second variety of xeroderma, but in this disease the skin is always thinner, and above all smooth, whilst even in the mildest cases of ichthyosis the furrows of the skin are exaggerated, and its surface rough. The milder grades of ichthyosis may, under certain circumstances, be confounded with diffuse psoriasis or lichen ruber, but the clinical history and primary efflorescences will guard against error. When most intensely developed, ichthyosis cannot be mistaken for any other disease.

Complications.—Concerning complications, little can be said. Not rarely, in cases of moderate severity, eczema is found in the flexures of joints, probably caused by the scratching and rubbing of the patient in trying to get rid of the crusts and scales. In an ichthyotic aged seventeen years, at the Breslau Clinic, psoriasis was observed to develop.

Therapy.—Little more can be done in the way of treatment than to alleviate the symptoms. The first indication is the removal of the abundant epidermal accumulations, which can be most speedily accomplished with soft-soap, or frequent baths and frictions with green-soap. In milder cases, the same end may be attained by injections of pilocarpine, the perspiration softening the scales which are then cast off. Such measures should then be adopted which will keep the skin supple, and prevent the reaccumulation of scales. For attaining this end, warm and vapor baths rank first, in conjunction with inunctions of ointments, whose composition is matter of indifference, provided they are bland. Internal medication has proven entirely useless.

ICHTHYOSIS FOLLICULARIS.

Ichthyosis follicularis, in which the disease is limited to the *follicles*, is quite rare, Guibout¹ really being the only author who has furnished a detailed description of it. He improperly calls it *acne sebacea cornea*, and differentiates it from ichthyosis. Both diseases are pathologically alike, however, and vary only in their localization.

In the place of any further description, I shall offer the following report of an exquisite case of this variety of ichthyosis:

S—Max, æt. 6 years. His mother and two brothers have normal skin; nothing can be ascertained concerning the father. A week or two after the boy's birth, his mother noticed the skin to be harsh, especially over the bridge of his nose, and over the edges of the auricles. Its present state was gradually attained. At birth the head was without any hair, and only during his third year did a scanty growth begin to appear.

Present condition: Over the extensor surfaces of the extremities, most markedly on the wrist and ankle, besides on the face over the brows, nose, and auricular edges, thin compact scaly columns, even as long as a millimetre, whitish or grayish in color, are seen projecting

¹ "Nouv. Leç. clin. sur les mal. de la Peau," Paris, 1879.

from a large number of follicles. The flexor surfaces and the trunk are very much less affected, and the palms and soles are entirely free. On the scalp, which centrally has a few isolated hairs, and peripherally a scanty growth, these epidermal spines may be seen projecting from a number of hair-follicles. The eyebrows are entirely wanting, and in this region the affection is very marked. Passing the fingers over the diseased parts produces a sensation like that caused by the prickly surface of a rose-leaf.

The treatment consisted of baths and spiritus saponis, systematically applied, whereupon improvement speedily followed, and the scalp having undergone the same treatment, an increased growth of hair became noticeable.

This form of ichthyosis and lichen pilaris are analogous in that excessive epidermal collections in and immediately around the follicles are common to both diseases; but, for all this, I believe they are distinctly separable, the scales of lichen pilaris lacking the cornification which characterizes those of ichthyosis.

ICHTHYOSIS CONGENITA.

In this form, the scaling begins to manifest itself at an early period of intra-uterine life. Although the phenomena presented by this variety of the disease differ from those met in the ordinary form, I consider it incorrect to describe it as a distinct disease different from ichthyosis, since in both cases the pathological processes are similar. Children affected with ichthyosis congenita are usually born a month or two before full term. They present a most striking appearance: the entire surface is covered with larger and smaller plates of epithelium, separated from each other by deeper and shallower furrows. These plates and furrows in all cases maintain such a regularity of arrangement as to make all the children affected look alike. On the trunk, in most cases, the furrows run transversely; on the extremities longitudinally, except about the joints where they have a more transverse direction. The size of the plates varies from one mm. to several cm., according to the region in which they are formed. From external appearances, one would infer that, the skin having become too small, inelastic, and harsh, the growth and movements of the child caused it to rupture at those places where the strain was greatest. This assumption is confirmed by the condition of the skin around the orifices of the body, and on the hands and feet. The natural folds around the orifices are absent. The lips are wanting, the ichthyotic skin extending to the alveolar processes. The eyelids are also wanting, and the eyes are covered by the swollen and everted conjunctiva. No auricle is seen, but a hardened mass of epithelium can be detected narrowing the auditory canal. The anal orifice is on a level with the surrounding surface and has rhagades radiating from it. The skin on the hands and feet being more resistant, is without cracks; but the fingers and toes are shortened and bent, and the feet club-footed.

The condition of the hairs is important with regard to this view. They are not present in the centre of the furrows, but along the sides they may be seen taking an almost horizontal direction until they reach the scales, after which they resume their normal direction. As the hair begins to develop about the third month of intra-uterine life, it may be assumed that only after this period the skin becomes unyielding from the production of the thick horny layer, and therefore tears in those places subject to the greatest traction. The previously developed hair-follicles are naturally absent in the middle of these fissures, and in the lateral portions take a different direction, corresponding to the traction.

The thickness of the epithelial plates varies between one and five mm., and they are traversed by the elongated orifices of the sweat and sebaceous glands. All the children born with this disease died several days after birth. Apart from the self-evident fact that death is due to the intense modification of the skin, it is impossible for these children to suckle, on account of the oral deformity.

Etiology.—Nothing is known concerning the etiology of the disease. Okel, Sr.,¹ saw two cases of it in two children born of the same mother within a period of one year. The same invariably fatal malady has been observed in calves.² The *prognosis* being absolutely fatal, nothing can be expected from treatment.

We may here refer to those skin changes which have been falsely called ichthyosis circumscripta or acquisita, and are acquired later in life.

On the lower extremities, when the seat of chr. eczema due to varicose ulcer, or more especially when affected with *pachydermie*, changes resembling ichthyosis very much in appearance occur here and there on the surfaces thus affected. At times there is only an excess of epidermal scaling, without any hypertrophy of the papillæ, whilst at other times the papillary hypertrophy is so marked (the papillæ being closely packed together, several millimetres high, and capped by horny scales) that the surface has the appearance of a rough file. Similar appearances have been described affecting the mucous membrane of the tongue.³ In these cases, the pathological changes are entirely local and due to an obvious cause, and not to a congenital pathological disposition of the skin to develop an excessive epidermis which is assumed to be the characteristic of ichthyosis. These changes of the skin, therefore, will be more properly denominated *keratosis circumscripta*.

CALLUS.

Callus (*callositas*, *tyloma*) consists simply of a hypertrophy of the horny layer of the skin, without necessarily involving any of the other tissues. The horny layer may attain a thickness of several millimetres, and gradually shades off into normal skin. The area covered by callus varies in extent with the locality and the exciting cause; the entire surface of the sole and palm may be the seat of callus. Anatomically, only an increase of cells in the superficial epidermal layers can be demonstrated. The rete Malpighii, the papillary bodies, and the corium never manifest any appreciable change. The furrows and lines of the normal skin are still recognizable on the surface of the thinner callosities.

The cause of callus is long-continued intermittent pressure. The pressure is from within by the bones, especially where little tissue exists between the skin and bones, and secondly from without by wearing apparel, but particularly by various kinds of tools. The soles of the feet, but more especially the palms of the hands, are the localities most favorable to the development of callus. It occurs much more rarely in other regions of the body, and is explained by the occupation of the patient. On the foot, callus is oftenest formed on the heel and ball of the big toe. On the hand, callus is variously situated, and the occupation of the individual may be diagnosed from the site of the callus. I have seen callus develop on the back of the fingers in physicians who practised imme-

¹ Cit. bei Lebert, "Ueber Keratose," Berlin, 1864, S. 108.

² Liebreich: "De Ichthyosa cong. intra-uterina," Diss. Halle, 1853.

³ Lebert, l. c., S. 159.

diate percussion. Chemical and thermal irritants will also give rise to the formation of callus. When the pressure exciting the development of callus is suspended, the skin will resume a normal or nearly normal appearance. When, from any external cause, a suppurative inflammation is engendered under the callus, this may be thrown off in toto in a very short time.

The disturbances produced by callus are of minor importance, and it may even serve as a protection against external violence. Very thick callus, however, may interfere with tactile sensibility, and the unrestrained movements of the fingers—a matter of no little importance.

Therapy.—The main indication is the removal of the exciting cause, which is in most cases impracticable. The removal of callus itself offers no difficulty; softening agents, such as warm applications, *sapo kalinis*, and paring with the knife, are agents sufficient enough. This treatment is only of transient benefit if the exciting cause is not also done away with.

CLAVUS.

A corn (*clavus*) is really a callosity, but presents certain characteristics peculiarly its own. It is a small thickening of the epidermis, from the centre of which projects a cone of horny tissue; this cone extends inwards into a depression of the corium. The papillæ and corium at the periphery of the corn are intact, the former being often hypertrophied; but in the centre, corresponding to the sunken end or root of the corn, the papillæ are atrophied or have disappeared, and the corium is thinner or even perforated. These changes are explained by the seat and origin of corns. They invariably occur where external pressure is exerted over a small circumscribed area against a bony prominence. Thus they are seen over the small heads of the phalanges and metatarsal bones on the soles of the feet; the central cone or "core" corresponds with the point of greatest pressure. It is evident that where external influences, oftenest badly fitting shoes, excite these epidermal formations, these horny developments in turn add to the pressure, and thus a *circulus vitiosus* results. Corns occur most frequently on the dorsal surface of the toes, and on the sole of the foot, more rarely between the toes and corresponding parts of the hands. Corns inconvenience on account of the pain they cause, and these may be so severe as to make walking difficult or even impossible.

Therapy.—The removal of the exciting cause, by procuring well-fitting shoes, is the first indication of treatment. This is not always easy to effect, especially when the toes are deformed. Rings of felt or adhesive plaster, applied over the parts most exposed to pressure, may prevent the return of corns, once they have been removed. Like callus, these horny formations are removed by emollients and the use of the knife. The dangers incident to cutting corns have been exaggerated, but at the same time it must not be forgotten that at the favorite seat of corns, small synovial sacs usually exist, which, if unluckily cut into, may lead to possibly serious results.

VERRUCA.

Unlike the epidermal anomalies already treated of, in the development of warts the papillary bodies are also implicated. Hebra has divided warts into two classes, congenital and acquired; the first includes those pigmented, usually more or less diffuse and flattened elevations of the skin bearing hair, and which do not change as the