

serous membranes appear infiltrated with moisture; the complicating diseases which occur in the internal organs are often not completely developed.

Treatment can only lead to a favorable result when the threatening accidents are recognized early. Children who are born feeble and delicate require careful nursing and attention. If the first signs of œdema or the asbestos-like whiteness and striking hardness of the limbs develop, apply softening poultices and irritating inunctions, aid nutrition by the administration of mother's milk or a good substitute, give a mild wine mixed with sugar several times a day, and endeavor to diminish the circulatory disturbances by internal and external stimulants. The stases can be relieved occasionally in this way, and the threatening accidents avoided. If a remission of the severe symptoms has once occurred, there is hope of improvement; the congenital weakness of vitality will finally give place to greater vigor, and the life of the patient thus restored.

ELEPHANTIASIS ARABUM S. PACHYDERMIA.

Symptomatology.—Under the term elephantiasis arabum is meant a disease of the layers of the skin and the subcutaneous connective tissue in individual parts of the body, running a chronic course, beginning with inflammation of the blood-vessels and lymphatics, and often leading to œdema and erysipelas; it is followed by an enormous, deforming increase of tissue.

The disease affects mainly the lower limbs and the integument of the genital apparatus, and two forms of elephantiasis, characterized by their localization, have been recognized accordingly, viz., Elephantiasis cruris, and E. genitalium.

Elephantiasis in other parts of the body was described partly as neoplastic formations, partly as telangiectatic elephantiasis if the swelling presented a great abundance of vessels. Such tumors were observed on the upper limbs, face, conchæ of the ear, and in this form they constitute monstrous appendages which hang down and produce traction of the adjacent parts of the skin. Rokitansky has described the vascular structures as tumors consisting of numerous lobes, and held together by dense fibrous tissue, and the contents of which consist of ducts containing blood, and terminating in blind extremities. Kaposi and Hebra ("Hautkrankheiten, Bd. II., S. 114) described cases of elephantiac tumors, distinguished by their abundant development of vessels, occurring upon the arms, and which may be regarded also as varieties of vascular tumors (tumores cavernosi).

In elephantiasis cruris, the origin and development of the affection are preceded by a morbid change characterized by the ordinary signs of erysipelas, and which is often combined with inflammation of the veins. The skin becomes inflamed, painful, shows the streaked redness of the affected lymphatic vessels or venous apparatus, and the neighboring lymphatic glands become thickened, swollen, and extremely painful. After the termination of the erysipelas, which is accompanied usually by violent fever, a slight œdematous swelling occasionally remains behind. The skin is slightly tense, shining, and the underlying connective tissue appears somewhat more consistent. In some cases the erysipelas runs its course without any sequelæ, and the diseased parts present merely a slight desquamation or change in the tissues. In the majority of cases, however, the œdema mentioned continues for some time, and if the skin is affected by erysipelas again or several times in succession, a tendency to persistent swelling of the lymphatic apparatus with increase of the œdema is thus produced. With the frequent recurrence of the erysipelas, either spontaneously, or after external provocation the œdema becomes permanent, the skin presents a slight depression on pressure, but as the subcutaneous tissue

is more resistant than in œdema which has developed without severe and frequent erysipelas, in places the yielding character of the integument is entirely absent, and it is hard and stiff. These conditions are also favored by the stasis of lymph in the vessels from the occlusion of the glands, on account of which the dilated lumina of the vessels become stringy and hard, and form a uniform mass with the infiltrated connective tissue. The increase in volume of the diseased parts constantly becomes more striking, and thus develops gradually that enlargement which causes the monstrous appearance of elephantiasis. The symptoms of elephantiasis have been found to develop within one or more years. The external form of the new-formed masses of tissue varies according to the parts affected. Elephantiasis of the lower limbs thus appears entirely different from that of the genital apparatus. The swelling and thickening of the affected limbs become shapeless, the contours of the muscles disappear, and the heavy shapeless extremity reminds one of the enormous dimensions of the leg of a rhinoceros or elephant, whence also the name elephantopus. The circumference of the limbs is not uniform. In a case of M'Call Anderson,¹ the circumference of the foot was about 62 cm., that of the calf 80 cm., and that of the thigh 69 cm.; in Bryant's² case the calf and thigh were 72 and 84 cm. in circumference. Still greater dimensions are observed in elephantiasis of the genital apparatus. Clot-Bey³ extirpated a tumor of the scrotum of this character which weighed 110 pounds. No less great dimensions are reported when the elephantiasis occurred in unusual localities. Thus in a case of Gussenbauer's⁴ of elephantiasis nasi in a boy æt. 14 years, the nose was 8.2 cm. long from the glabella to the tip, and 6.3 cm. broad.

The changes in the surface of the integument are manifold; it is either smooth, tense, and shining, or studded with numerous nodules, prominences, or circumscribed tumors which must be regarded as papillary proliferations and secondary formations, since all layers of the tegumentary tissue take part in the morbid process. But apart from the more marked changes of tissue and the new-formations on the surface of the skin, various morbid processes, such as eczema, papular efflorescences or ulcerations, are found upon it. The latter assume commonly an unfavorable appearance, develop slowly from the surface, but soon extend more deeply, destroy the fasciæ and muscles, and erode the osseous tissues. The edges of the ulcers are elevated, swollen, and form a crater-like wall around the deeply-spreading loss of substance. They must not be regarded as identical with those losses of substance which are observed in long-continued and neglected ulcers of the foot, which often result in thickening and enlargement of the adjacent parts of the skin and are usually regarded as an elephantiac affection. In places where the epidermis is unchanged, it is dry, rough, covered with thick lamellæ which are arranged in layers, next to and above one another, in a grayish-brown or dirty-gray mass, as in ichthyosis. In some places, however, the skin usually bursts, or even the lymphatic vessels are opened, on account of the severe stasis, and an escape of a clear, milky fluid thus occurs (lymphorrhœa or lymphorrhagia).

The changes occurring in the deeper layers are still more worthy of note.

The thickening and extraordinary enlargement of the affected parts depends on the increase of the connective-tissue elements in the subcutaneous stratum, as well as in the cutis itself. According to Virchow,⁵ accordingly, elephantiasis constitutes a diffuse con-

¹ Journ. of Cut. Medicine, 1869, vol. i., p. 182 and 191.

² Ibid.

³ Alibert's Vorlesung u. s. w., Bd. ii., S. 216.

⁴ Prager Medic. Wochenschrift, 1880, No. 21.

⁵ "Die krankhaften Geschwülste," Bd. i., S. 311.

nective-tissue tumor and belongs to the class of fibromata. The new-formed connective-tissue elements are present in such masses that they form a dense, firm callosity which increases still more in consistence and size, on account of a partial transformation of the other tissues, such as muscles, vessels, and nerves, into connective-tissue masses.

On the other hand, it should not be forgotten that the fibromata never develop as the result of conditions of stasis, and that they cannot be regarded as the result of transudations or real inflammation of the vessels. At the most, we may concede the analogy for those cases in which, in addition to the fibroma, circumscribed elephantiac new-formations develop, such as are observed occasionally in some of the joints of the toes or fingers, the breast, etc.

The function of the affected part of the body is thus impaired to a considerable extent, and often abolished. Patients who suffer from elephantiasis of the lower limbs are often hindered in walking, or drag themselves along with difficulty. Occasionally, these unfortunates are confined to bed and present a picture of wretched misery.

Elephantiasis of the genitals in men almost always starts from the scrotal integument; in women, from the labia and clitoris. In some cases, the disease appears first upon the penis; in others, upon the scrotum. Elephantiasis of these parts often attains a very considerable size, but the larger tumors occur on the female genitalia (labia majora) and, being circumscribed tumors, often form the subject of operative treatment. Reyer¹ has published a large number of observations, collected in Egypt, of individuals suffering from E. genitalium, in which the tumors weighed forty to fifty pounds, and the patients had been affected with this disease for twenty years and upwards. Reyer adds the statement that the impossibility of satisfying the sexual desire causes perhaps the greatest suffering to the Arabians. In these tumors, which extend almost to the knees and ankles, a small, navel-like depression is usually visible in the upper third of the tumor; this presents itself to the examining finger as a narrow furrow, and leads either to the glans penis or the entrance to the vagina. In other respects, however, elephantiasis of the genitals does not affect the general health of the patient to any extent, and Alibert² reports as a curiosity that the above-mentioned patient, who was operated upon by Clot-Bey, and whose elephantiac scrotum, when removed, weighed one hundred and ten pounds, produced two children after the disease had lasted thirteen years, but before it had attained its monstrous development—a proof that the functions of the testicles had not been destroyed by the morbid process.

The other subjective symptoms are the same, at the onset of the disease, as in erysipelatoid and lymphatic inflammations of the skin. In addition to general febrile disturbance, the patients suffer from tension, drawing, and pains in the affected parts of the skin—symptoms which disappear gradually after the formation of the tumor has assumed the upper hand, and are then followed by the above-mentioned annoying conditions of increase of weight and formation of the tumor.

The inguinal glands are always swollen and enlarged, and occasionally form small tumors in the groins,³ which sometimes permit the escape of lymph.

In addition to the localities mentioned, elephantiac formations also occur in other parts of the body, such as the upper limbs and the integument of the face, but these ex-

¹ Zeitschrift der Gesellschaft der Aerzte. "Ueber Elephantiasis der Geschlechtsteile." Wien, 1855. Nos. 10, 11 und 12.

² In loc. cit., S. 217.

³ Hendy: "Die Drüsenkrankheiten von Barbados." From the English. 1788.

cessive hypertrophies of the skin and the connective-tissue layers are rarely the results of disease of the vessels, but rather of other neoplastic formations, such as syphilis, lupus, etc.

With regard to the age of the affected individuals, almost all statements are agreed that it develops between the twentieth and fortieth years, and that it is very rarely found outside of this period. I have under observation a patient, a boy of twelve, who suffered from severe prurigo, and in whom an elephantiasis of the left foot, extending half-way up the leg, developed within three years. The increase of volume is very considerable, and the circumference of the ankle-joint measures 40 cm.

The opinion that this disease is observed exclusively in the orient has long been refuted, and elephantiasis may be regarded as a disease extending over the entire surface of the earth. However, there are certain geographical latitudes in which it occurs with great frequency, viz., India, Africa, and some districts situated in the tropics. In some parts of India it has been observed in such numbers that, in 1857, according to an English writer, among 48,600 inhabitants, 2,133 individuals were affected by it.¹ In Africa it occurs in much smaller numbers, mainly in Egypt, Tunis, and Barbary.

Anatomy.—Rayer² gave an admirable description of the changes in the integument. He regards the enormous proliferation of tissue as the most important change, and first emphasized the fact that the fibrillæ of connective tissue appear in a number of layers placed above one another. As another striking feature, he regards the serous fluid abundantly present in this tissue, and which can be removed readily upon pressure with the finger, as well as the profusely embedded fat-cells. In addition, the papillæ appeared considerably enlarged, the epidermis thickened and discolored. These appearances were also observed by Henle, Simon, Lebert, and others. Virchow³ devoted close study to the microscopical anatomy of the skin, and thus shed the most light on the peculiarities of this morbid process. Upon section from the surface to the bones, the skin often shows a hard, fibrous callosity of waxy consistence in which scarcely anything but fat and muscular substance can be distinguished. After prolonged duration of the disease, the nervous substance is also destroyed, and where it can no longer be found distinctly in the dead body, anæsthetic and paralytic conditions were present during life. The clear yellowish fluid which appears in abundance on the cut surface of the skin is nothing more than lymph which coagulates in the external air. Virchow explains this accumulation of lymph by the fact that in elephantiasis the glands swell at an early period, and thus impair the functional activity of the lymphatic vessels. On account of the stasis of lymph within the vessels, these become dilated and thus give rise to the abundant presence of this whitish-yellow fluid which had already seemed characteristic to Rayer. This primary affection of the lymphatic glands thus constitutes an important differential characteristic from other œdematous and erysipelatoid inflammatory conditions. The epidermis presents a variable condition, occasionally is very thin, in other cases considerably thickened. When the papilla is not distinct, the epidermis thin and smooth, when it is strongly developed and branched, it will be covered by the epidermis in thicker layers, and following the elevations, produce the previously mentioned ichthyotic appearance. The Malpighian layer often shows considerable increase of pigment, and the capillaries are dilated in places. In some cases the lymphatics are entirely

¹ Hirsch: "Histor. Geograph. Pathologie," Bd. ii., S. 477.

² "Maladies de la Peau."

³ "Krankhafte Geschwülste," Bd. I., S. 300 et seq.

intact, but then the veins are markedly dilated, with distinct hyperplasia of the tunica adventitia.

Etiology.—The causes of elephantiasis were sought in climatic and telluric influences by many observers who saw it frequently in tropical countries. English physicians particularly regarded the moisture in the air as an especial morbid factor, inasmuch as some individuals, especially from the poorer classes, being exposed to frequent colds during the rainy season, are more readily predisposed to inflammations of the tegumentary and vascular apparatus. In addition, the constitution of the soil, the ingestion of certain articles of food, drinking water, hereditary tendency, and various other general or occasional causes were regarded as factors giving rise to elephantiasis.

Such vague statements can only be supported by the circumstance that elephantiasis appears more frequently in tropical countries; but investigation furnished a definite morbid factor, which is certainly not without pathogenetic significance, in a series of similar diseases, viz., the occurrence of *Filaria sanguinis* in the blood and lymph. Lewis¹ has carefully studied the pathological conditions produced by filaria and its embryos, and has shown that in the blood and lymph capillaries they may adhere in greater numbers in places to the vascular walls, there give rise to disturbances which lead to stasis and embolism, and afterwards produce tumors of the lymphatic vessels and veins with subsequent elephantiasis. Numerous physicians in Brazil, Australia, and India regard this action of the filaria in producing elephantiasis as undoubted, and we must grant the validity of this factor in the tropical form of elephantiasis.

But there are other factors which may be regarded as exciting causes and which explain the development of elephantiasis in almost all parts of the inhabited globe.

Among these may be included all those morbid factors which produce inflammations of the lymphatic apparatus and the vessels of the skin. One of the most frequent causes is erysipelas which always precedes the outbreak of the disease. Chronic ulcers of the leg, continued eczema of the extremities also give rise to these hyperplastic conditions; furthermore, dilatation of the vessels, varices, thromboses, and obliterations in parts of the vessels situated higher up, and circulatory disorders of various kinds may produce disease in a like manner. Lupus and syphilis also cause persistent thickenings of the skin, by means of which it may acquire an elephantiac appearance.

The same causal factors hold good for elephantiasis of the scrotum; its great vascularity and the numerous lymphatics readily permit the development of this affection.

Prognosis and Treatment.—Elephantiasis arabum is always an extremely annoying affection, and in some cases even leads to a fatal termination. The inconveniences experienced from dragging about a foreign weight, the difficulty in the use of the affected parts, in themselves produce persistent bodily disturbances in addition to general depression and melancholia. Circulatory disturbance, formation of thrombi, and inflammatory conditions of various kinds develop. In a few cases, Hebra observed pyæmia with a fatal termination from the spread of inflammations of the veins, but such terminations do not occur often, and in the majority of cases, the organism usually accommodates itself to the changed conditions, as the disease always progresses very slowly. The patients enjoy a longer lease of life than we often would be led to expect from the morbid conditions. According to Hendy, cases of spontaneous recovery also occur, but this is only possible in the earliest stages of the disease.

Treatment is tried in various ways, partly by combating the development of the

¹ "On the Pathological Significance of Nematodes Hematozoa," 1874. *Annals of Derm.*, 1881.

elephantiasis, partly by amelioration of the existing conditions. In elephantiasis of the legs we may endeavor to secure recovery without operative measures, which can never be effected in elephantiasis of the genitals. If erysipelas is present, it is treated in the well-known manner by rest, cold applications, and antiphlogistic remedies, and if its entire recovery is effected, one factor at all events is removed which inaugurates the development of elephantiasis. Often, however, no retrogression of the existing erysipelas or the persistent œdema can be produced despite the most appropriate treatment, and more elaborate treatment must be undertaken.

The older physicians employed local abstraction of blood, mainly by opening the saphenous or femoral veins, but the results were insufficient, and this plan has been abandoned. Frequent scarifications would be more in accordance with the object to be attained, as they may give rise to partial absorption of the œdema in circumscribed parts of the skin. But even this method of treatment has been attended with very slight success.

Partial retrogression of the elephantiac process may be secured by methodical compression of the skin by roller bandages of linen, flannel, and rubber, which are changed frequently; their constant pressure may result in increased activity of the lymphatics with subsequent absorption of the lymph. In this plan of treatment, rest for the affected leg is always necessary, and the patients must endeavor to avoid excessive filling of the extremity with blood by keeping to bed and horizontal position of the foot. The bandages may be associated alternately with the use of emollients, such as iodine and mercurial ointments, exceptionally by the employment of full baths and vapor baths—a plan of treatment which, if continued persistently for a number of months, renders possible the absorption of infiltration which has reached an inch in thickness.

If secondary morbid conditions, such as eczema, ulcers, proliferation, etc., are also present, these must first be cured or improved, in order to combat the primary affection more readily. A compressing bandage, which must extend from the tips of the toes to beyond the limits of the thickened leg, undoubtedly results in a diminution of the volume dependent on the œdema, but it rarely reduces a long-standing increase of tissue to the normal and as these methods of treatment fail in a certain stage of the disease, many physicians have decided upon amputation of the diseased limb. But this operative measure is not always followed by the desired result. In amputation of the lower limbs, many of the patients died, and even in individuals who survived, the elephantiasis again appeared in other places. The best success was obtained from the operation for scrotal elephantiasis, which was carried out with brilliant results by the French and German physicians in Egypt.

Some time ago, another form of operative interference for elephantiasis of the leg was proposed by American physicians and practised with the best results. In 1851, Carnochan,¹ of New York, had effected complete recovery in a case of advanced elephantiasis cruris by ligature of the external iliac artery. Others have repeated this operation for the purpose of restricting the supply of nutritive material, and subsequently obliterating a certain tract of the vascular system in the tissues supplied by it. A few of the patients died of pyæmia, but the majority obtained a useful limb. Among 15 cases Erickson found 7 cases of recovery and 3 of improvement reported, and Leonard,² who had a favorable case, has found from the statistics collected in literature that among 69 cases

¹ *Journ. of Cut. Med.*, Vol. i., p. 188.

² *British Med. Journ.*, 1879, Vol. i., p. 934.

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-