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B. Diseases of the Trophic and Vaso-motor Nerves.

In spite of the epoch-making labors of Samuel (cf. lit.), who, after Romberg, was the first to postulate the existence of definite "trophic" nerve fibres for the regulation of the nutrition of the tissues, we are to-day still unable to demonstrate such fibres, nor do we know whether there exist purely trophic centres, or whether the trophic influence is exerted by some centres already well known—viz., by the motor, sensory, or vaso-motor. On the other hand, the existence of such a direct trophic influence of the nervous system upon the tissues can not be called in question. Again, we can not as yet decide whether or not this influence, upon which the nutrition of the

tissues normally depends, is different for different tissues—as indeed seems quite probable—and whether it has to be regarded as acting by inhibition or rather by an active stimulation.

Occasionally, besides the trophic we meet also with vaso-motor disturbances, which lead us to conclude that not only the vaso-constrictor but also the less important vaso-dilator nerves may become affected. With their anatomical relations we are better acquainted than with those of the trophic nerves. At any rate, we know that in the cerebrum and in the medulla oblongata vaso-motor centres do exist. In their further course the vaso-motor fibres are thought to pass through the lateral columns of the spinal cord and to leave it through the anterior roots, but this is not yet proven; nor can we accept the existence of Goltz's vaso-motor reflex centres in the spinal cord without further investigation.

The vaso-motor disturbances which we sometimes see in acute diseases—for instance, in typhoid fever (Money, Lancet, December 3, 1887)—are phenomena due either to a condition of paralysis or of irritation. In the former case we have reddening of the skin with elevation of the temperature and more or less pronounced pain, which become more marked when the patient is exposed to a warmer atmosphere, and which are not with our present resources amenable to treatment. This affection, which has been attributed to a diminished energy of vascular innervation, has recently been called "erythromelalgia" (Weir Mitchell). In the latter we have marked pallor and coldness of the skin, associated with formication, subjective sensations of cold, as, for example, in the so-called anæsthesia lavatricum (cf. Hirt, Krankheiten der Arbeiter, 1878, Part II, p. 100). Such disorders do not, however, always lead to trophic changes. It is rather probable, as Kopp thinks, that, if the latter occur, disturbances in the nutrition of the vessel walls must have preceded them (cf. the work of Thoma, lit.).

Sometimes vaso-motor and trophic disturbances may co-exist as genuine complications.

Of clinical importance is the fact that trophic changes may occur either by themselves or accompany other central, cerebral, as well as spinal affections. This may be explained by the fact that, in order to bring about alterations in the trophic influences, it is not necessary to have a disease of the ganglionic cells or cell groups, which probably act as centres, but that

pathological processes in the peripheral nerves may also have the same effect. Among the central affections, which, however, may remain latent for a long time, so that one might be led to regard the trophic changes as independent affections, we must mention in the first place tabes—which we shall discuss in this connection later—hysteria, certain cerebral diseases due to changes in the vessels, such as apoplexy with the acute bedsore, of which we have spoken on page 232, and again diseases of the gray axis of the spinal cord (Jarisch), among others the "paralysie générale spinale antérieure subaiguë" (Pitres et Vaillard, Prog. méd., 1888, 35). To the diseases of the peripheral nerves, and the infectious diseases in the course of which trophic disturbances may occur, we have already alluded.

At present we can form no idea how many diseases, not only of the nerves and of the muscles but also of other organs, we shall have to call "trophic" when we have once become better acquainted with the position of the trophic centres and fibres than we are now. For the present the term is restricted to a small number of affections, and it will suffice to say a few words about the most important among them, and first about the tropho-neuroses of the skin.

Anomalies of secretion which have to do with the sebaceous as well as the sweat glands are not uncommon. It is well known that seborrhœa, for example, may occur after long-standing menstrual disturbances, chlorosis, anæmia, after over-exertion, or as a consequence of too great sexual excitement, masturbation, etc., especially in young individuals, whereas diminished secretion of the sebaceous glands, as found, for instance, in ichthyosis and in senile atrophy of the skin, is comparatively rare. The purely nervous origin of this, as well as of hyperidrosis and anidrosis, can hardly be questioned. Hyperidrosis is seen on one side alone or on both sides in central diseases—for instance, in some diseases of the medulla oblongata (Traube), of the spinal cord (spinal apoplexy, myelitis), and of the entire nervous system (tabes, hysteria). It also occurs reflexly (Raymond). The anidrosis appears in peripheral facial paralysis, in dementia paralytica, and in certain skin affections, such as psoriasis, lichen, and ichthyosis.

Among the skin affections associated with exudation we have erythema nodosum, urticaria, and a disease probably akin to it, the angio-neurotic œdema (Quincke), which appears sometimes quite suddenly on different parts of the body, the patient

feeling otherwise perfectly well. The hydrarthrosis intermittens, which Féré has regarded as an articular angio-neurosis (Revue de Neurol., 1893, 17), and cutaneous swellings of nervous origin accompanying the menses (E. Boerner, Volkm. Samml. klin. Vortr., 1888, xi, No. 312), have been described. Again, we have certain forms of eczema, prurigo, herpes zoster, and others, although their nervous origin is not established beyond doubt. As every one of these affections presents in its development, in its clinical significance, and in its treatment, so much that is by no means clear, we deem ourselves hardly called upon to enter into a detailed description of them here. Some, as, for instance, the herpes zoster in the course of facial paralysis, have been mentioned above (cf. page 90). Equally obscure is the origin of cutaneous hæmorrhages—as, for instance, the ecchymoses which occur in tabes after severe attacks of pain—of the pigment hypertrophies (e. g., in lepra), of the anomalies of cornification (keratosis and ichthyosis), of the nævus, which is said to be due to intra-uterine disease of the spinal ganglia, of the atrophic conditions of the skin (striæ and maculæ atrophicæ), of the so-called glossy skin (glossy fingers), of the pigment atrophies (vitiligo), of the atrophy of the hair, and the atrophies or deformities of the nails, changes which we meet with in the most varied nervous affections and under the most varied circumstances.

An interesting angio-neurosis is the so-called night palsy, which has been described by Ormerod, Bernhardt, and others. It consists in numbness, pain, and a feeling of weakness occurring at night in the upper extremities. Distinct anæsthesia and actual paralysis are not present. Women are affected more frequently than men, and seem to be particularly prone to it at the menopause.

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The so-called symmetrical gangrene of the fingers and toes (sclerodactyly) which was first described in 1882 by Raynaud, and which has, after him, been called Raynaud's disease, comes on with the following symptoms: The fingers appear at times as if dead ("*doigts de mort*"), at another time they turn a dark-red color and burn violently. Gradually disturbances in nutrition, at first only transitory, later permanent, develop, and blebs form, which open, leaving a sore which heals with loss of substance. The nails fall out and are not replaced, whole parts die, the necrosis being symmetrical on both sides, and none of the usual causes of gangrene—such as disease of the heart or of the blood-vessels, septicæmia, traumatism, etc.—are present. The disease is, however, very rarely met with in its full development, while lighter grades, in which we have only to deal with a transient spasm (or paralysis) of the vessels, especially in the hand, are not uncommon. In such instances the hands become bluish and icy cold, and we have a condition known as local asphyxia. Raynaud's disease may be confounded with peripheral neuritis, ergotism, diabetes, and senile gangrene. It should, however, not be difficult to avoid such a mistake if we take into consideration the characteristic course of the disease and the absence of any of the ætiological factors before mentioned. In the treatment favorable results have been repeatedly obtained by bathing the hands in warm water and the application of alcoholic menthol solution with a camel's-hair brush.

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Undoubtedly a close relation exists between Raynaud's disease and scleroderma. In this latter very rare affection, which also depends upon trophic disturbances, the skin, after having presented œdematous swellings in the first stage, becomes later hard and immovable, so that it is impossible to pick up a fold of it between the fingers. The affected parts, more particularly the face, neck, and the upper portion of the chest, where frequently a diffuse increase in the pigment is noticeable, are impeded in their movements, the play of the features is lost, the mouth can not be completely opened, the eyes can not be closed, and rotation of the head becomes impossible, etc. The patient feels a sensation of discomfort; the coldness of the skin, which reminds one of that of a corpse, is most distressing, and a slight fall in the outside temperature is sufficient to bring about cyanosis. Quite gradually the atrophic, the terminal, stage comes on, in which the skin gets as thin as paper, remaining, however, firmly fastened to the underlying tissues, so that it is still impossible to pick up a fold. With these changes is associated an atrophy of the muscles, which has to be regarded partly as a tropho-neurosis, partly as an atrophy due to inactivity, and the patient becomes helpless and unfit for work. After the disease has lasted for several years, if convalescence has not set in in the second stage, a general marasmus develops which leads to a fatal issue. An effectual treatment is not known. Warm baths, simple ointments, the constant current, internally tonics, iron, cod-liver oil, etc., may be tried, but we are not justified in placing any confidence in them.

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The next affection to which we shall call attention is as remarkable as it is rare. According to our present ideas, it has also to be ranked among the tropho-neuroses. We are referring to a very gradually developing atrophy of the face (sometimes ushered in by pain and paræsthesias), which may appear on one or both sides, and generally embraces equally the skin, the subcutaneous tissue, the muscles, and the bones. The beginning is usually as follows: Whitish spots appear on the skin of the face, which sink in more and more and are accompanied by a diminution of the fatty tissues below; gradually the atrophy increases in extent, and nothing escapes with the exception of the musculature, and this only occasionally and for a certain time. The affected side is sunken in, and the skin assumes a whitish-brown discoloration. The bones, especially the upper jaw, and with it the teeth, atrophy; the latter fall out, as well as the hair, which often appears of a light color or distinctly gray. The bone atrophy is the more marked the younger the patient at the onset of the disease (Virchow). If the disease is confined to one side only—hemiatrophia facialis—the median line forms a sharply defined border and the diagnosis is very plain. If both sides are affected, as happened in Eulenburg's case after measles (Lehrb. der Nervenkrankh., 1878, ii, p. 620), it may be more difficult to recognize the affection. The grooves