met with as often in one as the other, but that suppuration is more rare in chancre. It might be interesting to ascertain whether this evinced sympathy of the lymphatic glands in any way modifies the later consequences of the disease; whether the local suppuration is, in any degree, eliminative. I believe it so acts in the case of some animal poisons: for example, dissecting wounds have usually more serious consequences, that is, more rapid and severe constitutional effects, when the lymphatic glands are not involved, and the poison passes, unchallenged, into the circulation. They appear to arrest or to modify the poison; and their suppuration seems to act eliminatively.

I think I can say most positively that I have treated many cases of soft sore as the first disease contracted; that mercury is frequently needed for their cure; and that they are sometimes very obstinate before they heal.

The doctrine assumed and argued out by Mr. Travers, in reference to the venereal disease, is simply that of evolution, governed by circumstances which are, in great measure, personal, but also dependent on environment. The presence of certain conditions is essential to the production of the disease in any type; and these are the same that favour its progressive development in its more virulent forms. The conditions referred to would seem to exist especially amid a densely populated and civilised people, whose culture is not measured by the standard of moral refinement or personal cleanliness. Yet, even with these disadvantages, medicine and sanitary measures have done something towards the devolution (I use the word as the reverse of evolution) of the disease, if I may draw any conclusion from the contrast between the more exaggerated forms of syphilis when I entered the profession and those of the present time: for, as regards the treatment of the disease in hospital practice, I cannot say that there is much change of opinion as to the use of mercury since I began to study. It is true that instances of profuse salivation then came under our notice; but such practice was not initiated nor pursued in the hospital; and inoculation and fumigation were more generally used as the means of introducing mercury into the system. Sarsaparilla had a high reputation, which has since been, as I think, unjustly denied to it: for it seems to be now entirely ignored. The treatment by iodide of potassium dates from a period more recent than that of which I have been speaking: in it we have a very valuable remedy in secondary affections. But such cases as were then of common occurrence are, as I have remarked, according to my observation, comparatively rare now. I refer especially to exaggerated forms of rapid, phagedenic ulceration of the thigh and abdominal wall, and extensive exfoliation of the skull and other bones; the last-mentioned having been, as I think, not unfrequently due to the abuse of mercury, especially in strumous patients.

I am free to admit that my opinions on these subjects have been, in a measure, influenced through life by the impressions I received thus early; and may, therefore, appear obsolete to the present generation. Yet there is nothing irrational or fantastic in the application of the theory of evolution to disease. Time and circumstance are the requirements of the advocates of this law; and I believe that, with the command of these essentials, a process of devolution may likewise be accomplished. I may add that there is no inconsistency in this application of the theory of evolution with the assumed germ-origin of many diseases; for the specific type and virulence of the poison seem to depend more on some occult attribute of the micro-organisms than on any striking variety in their physical development.

The culture of Pasteur is effecting, rapidly and artificially, what Nature, under favouring circumstances, can and may achieve in time. I apprehend few surgeons of experience would deny that simple tumours sometimes assume a malignant character, and that there are various grades of malignancy. We may some day discover how to reverse this progressive order of evolution, and thus solve the great surgical problem of the day,—the cure of cancer.

These may seem flighty speculations to indulge in, without even the plea of novelty to recommend them. But it is, I think, the wholesome tendency of youth to specialise; and it is the privilege of maturer years to generalise, as exemplified in Mr. Hutchinson's valuable lectures. The time may come when a more enlarged and general recognition of the law of evolution in disease will lead to some unlooked-for revelations, and to the discovery of some more efficient means of not only abating the intensity, but of limiting the variety, of infectious and hereditary maladies; and this must be by denying the requirements of evolution, and favouring those of its reverse.

There surely is no more difficulty in thus simplifying the origin of infectious disease,—for example, in tracing a hard chancre, with all its constitutional sequelæ, to a purulent discharge from a mucous surface as its progenitor,—than in recognising the alliance between

man and a monad. If in each case there are missing links to be supplied, I apprehend they are nearer to hand in the former instance than in the latter.

THE THERAPEUTICS OF THE NEUROSES.

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It is necessary to make a few preliminary remarks.

1. Although neuroses are devoid of any recognised pathological anatomy, there can be no doubt that they are evidences of depraved or disordered nutrition, or, at least, of abnormally altered relations between nerve-cell and supplying blood-vessel.

2. Neurotic patients frequently inherit from one or both parents the tendency to their peculiar nervous state; but a large number of neurotic phenomena occur in persons who have inherited no such history. They are met with after overpressure of study in the young, overwork of any kind in the adult, monotony of occupation, anxiety, hygienic conditions abnormal both as regards the healthiness of the environment and the proportion of brain-food to brain-work; and they mean partial starvation of the nervous centres.

A few of the chief neurotic symptoms are: dilated pupil; extreme mobility of the iris; a form of amblyopia that is reflex, of vaso-motor origin, induced by irritation of some of the branches of the fifth nerve, or of filaments from the abdominal or pelvic organs, carried to a vaso-motor centre, and causing constriction of the arteria centralis retinae; or probably sometimes of the vessels supplying the angular gyrus; hemiopia, associated with anaesthesia, and depending on disordered blood-supply to the posterior portion of the internal capsule; various forms of anaesthesia, often very localised, manifestations of a temporarily impaired circulation in the cortex or in the internal capsule, often due to the concentration of the patient's attention on pain elsewhere, or to her thoughts being directed to her emotions or to exalted aspirations; some forms of headache, especially migraine, and the so-called nervous headache often induced by late watching; insomnia, particularly the form engendered by late intellectual work for some considerable period, and relieved by placing a patient for sleep in a nearly upright position, and administering food during the night—or by the administration of ergot; tinnitus, which may often be reflex, and carried up to the tympanum by way of the inferior cervical ganglion; abnormal acuteness of hearing, from ephemeral dilatation of a vessel supplying some of the auditory nuclei, or still more frequently the temporo-sphenoidal convolutions; vertigo, either seeming to depend on slight alterations of pressure in the labyrinth, short of Menière's disease, or when there is a temporary deficiency in the circulation of the middle lobe of the cerebellum; occasional abnormalities of depraved or deficient taste and smell. Motor phenomena in neurotics are so numerous that it is difficult to omit any abnormality of movement from this class; tremor, as of the eyelids; rigor without elevation of temperature; convulsions, either epileptiform, or without complete loss of consciousness, and accompanied by movements of limbs either semi-voluntary or automatic; opisthotonos; hysterical vomiting, with no reflex connection with the pelvic viscera; some varieties of chorea and of hemichorea; paralysis, too universal to depend upon organic lesion, or localised, as of a finger, hand, or arm; contractions, such as torticollis, varieties of talipes, bent arm, the body resting on the heels from flexion of the legs on the thighs; these and many other advanced motor phenomena depend on emotion, and are produced by emotional irritation of vaso-motors in various regions of the brain and cord.

The hyperaesthesiae of skin, such as are seen in some neurotics of unsound mind; hyperalgesia, such as clavus, and the obscure inframammary pain, the tenderness of the hysteric spine, are due to dilatation of vessels in the sensory centres. In speaking of these phenomena, it need scarcely be said that we exclude all cases in which the will of the patient is sufficiently strong to effect a cure. Sir James Paget's expression of an hysterical person, "She cannot will," will serve to include all cases of neurasthenia in neurotic patients.

Amongst the psychological phenomena, it would be necessary to mention every manifestation of emotion. The subjects of "temperance" are probably invariably neurotic. Great excitability may be the rule, reaching on one side even to mania, especially religio-erotomania; whilst in some cases, the melancholic tendency obtains, with concentration of thought on anything connected with the patient herself, especially her physical ailments.

Of sympathetic phenomena, some connected with the eye have been already referred to. Blushing, pallor, palpitation, faintness, irregularity of heart, neurotic angina (in each case unassociated with organic lesion), various hyperæsthesiæ of the abdominal cavity, colic, gastralgia, enteralgia, hepatalgia, nephralgia, inertia of bowels, disordered secretions, some forms of diarrhœa, meteorismns, and phantom tumour, are all connected with emotional action on the circulation; either by way of the vaso-motor centres in the medulla, of the subordinate centres in the spinal cord, of the cervical ganglia, or of the great ganglia in the abdomen.

Amongst sympathetic phenomena may be placed the copious pale urine of the hysterical, and the various neuroses of the extremities. Of these, one of the most remarkable is the symmetrical gangrene of the extremities, occurring without blocking or disease of arteries.

In any given patient, it is so difficult to exclude all possible causes for elevation of temperature, that the existence of neurotic pyrexia is still an open question. But when, in a highly neurotic patient, free from tuberculous and gouty taint, with all organs seemingly free from lesion, the thermometer, under the careful watchfulness of the physician himself, registers a decided elevation, the question arises whether there is such a thing as a functional paralysis of the heat-inhibitory centres. That such centres exist, seems now positively proved by pathological observation. Their very locality is more or less accurately ascertained. Their functional disturbance was some time ago a subject of discussion at the Academy of Medicine in Paris. We believe that such functional disturbance, brought about by an irritable condition of the vaso-constrictors, is a fact, and one that can be explained in no other way than by vaso-motor action. It is, of course, wholly outside the will of the patient. May not the high temperature met with in the status epilepticus be the outcome of a similar causation?

It is seen, therefore, that the protean phenomena in neurotic patients are due to an abnormal excitability of the sympathetic nerves and ganglia. Given this excitability, the sympathetic system is played upon directly by emotion, reflexively by irritation, or by slight functional disturbance affecting a ganglion, or any nerve-twig leading to a ganglion. Although, therefore, the different neuroses may demand a treatment that varies according to the organ affected, yet no treatment is likely to be effectual that does not act on first principles, and endeavour to subdue, generally by means of nerve-tonics, this morbid excitability.

If one seeks a term that will express the predisposing cause for neurotic phenomena, one must use some word that will mean "starvation of nervous centres." This may be either a cell-condition *ab origine*, or a cell condition induced by a disorder of vessel. Remedy for it may therefore take the form of better nutriment to the cells (fatty and farinaceous food), or of means that will improve arterial tone, and so foster a normal osmosis. Pretty frequently both classes of remedies are called for, and, in some cases, neither will be really efficacious, until the patient is removed from an environment either of depressing circumstances, or of a malarial or other toxic atmosphere. The Weir-Mitchell system for treating hysterical persons goes mainly on the principle of brain-feeding, though also making a point of removing them from hurtful surroundings. How useful the excess of fatty food is in the treatment of many forms of mental disease, themselves only modifications of neurotic phenomena, need hardly be said. To promote the normal nutrition of the whole brain, is only another mode of saying that the intellectual centres must not fail in their inhibitory influence on the emotional; that the controlling centres of chemical action in the body, and thereby of animal heat, must exercise their due function; that those which present undue vaso-motor constriction or dilatation must be kept in their normal state of balance; that the seats of sensory perception shall be neither too acute or too dulled, a condition probably largely under the influence of the circulation; that the voluntary motor area shall be, in its whole extent, governed by the will; and that each movement shall be properly co-ordinated with its associates.

Besides the question of food, that of the promotion of a normal circulation takes first rank. We are speaking, of course, of cases in which there is no coarse lesion. In such patients, the occurrence of neurotic phenomena may be prevented by exciting a better condition of heart-action, by increasing arterial tension, or by obtaining both these effects. Ammonia, ether, iron, digitalis, strophanthus hispidus, convallaria majalis, strychnine, belladonna, and, in very moderate doses, alcohol, stimulate the heart. It is nearly certain that, in a slight degree, alcohol in small doses really stimulates the heart, over and above its paralytic effects on the vaso-constrictors. In a much slighter degree, arsenic and jaborandi are heart-stimulants. Arterial tension is increased by ergot, belladonna, the bromides, the acids, squill, calabar bean, strychnine, nitrate of potash, casca bark, and turpentine.

But over and above brain-feeding, and increase of cardiac action, or of arterial tension, there is something that takes place in the walls of vessels under the influence of such agents as arsenic, the salts of zinc, caffeine, nux vomica, guarana, etc., that seems to prevent undue constriction and undue dilatation of vessels, especially probably the smaller arterioles and the capillaries; the effect of which influence is to promote a normal osmosis, the taking in of supply from vessel to cell, the giving out effete material from cell to venule.

These three modes of action on the higher nervous centres may be considered as of equal efficacy in respect to the sympathetic ganglia. The great semilunar ganglia are of the highest importance with reference to the abdominal and pelvic nerves; scarcely less so with reference to the heart itself. But not these only. Every sympathetic centre in the brain and the medulla oblongata, in each segment of the spinal cord, in the vast chain of ganglia on each side of the vertebral column, in the structure of the heart, the stomach, the intestine, the uterus, connected with the liver, the spleen, the pancreas, the kidney, on every vessel of a small or medium size, demands, like the brain itself, a rich nutrition, a normal circulation, an easy access from cell to vessel, to vessel from cell. Each ganglion, however insignificant, is under the control of those above it, and may itself be the centre of a reflex arc. It is on their well-being, in every ramification of the body, except perhaps in the pulmonary (as opposed to the bronchial) tissue, that nutrition in the highest sense belongs; a nutrition that, whilst usually dependent on the whole chain of ganglia, from the lowest at the periphery to the highest in the cerebral cortex, yet, in the case of acephalous monsters born alive, is shown to be possible under the control of the sympathetic ganglia alone.

It would be tedious to examine each neurotic phenomenon with reference to therapeutics, especially as large groups of them vanish sometimes under the administration of some one remedial agent. In some, the remedy used seems to exercise a tonic effect upon the nerve-nuclei in the medulla oblongata. Guarana in migraine, quinine, arsenic, gelseminum, in neuralgia of the fifth nerve, are instances of this. Does not digitalis act in steadying the heart by giving power to the nucleus of the vagus, the heart's inhibitory nerve? In many diseases, quinine acts as an antipyretic by its antiseptic properties; but where no septic influence can be supposed, does it not reduce hyperpyrexia by its tonic influence, on heat-controlling centres in the cortex of the brain? Is not the hyperpyrexia of hysteria—sometimes so marvellous in its intensity—best met by lines of treatment that bring back the normal power to all portions of the nervous system, and thus to these heat-controlling centres? In the palpitation dependent upon spinal jar, where no organic change has taken place, no ordinary means are of any avail, unless the jarred portion of spine, from which arise the nerves that supply the cervical ganglia, particularly the inferior cervical ganglion, has been allowed a prolonged period of rest. In this neurosis, the cardiac symptoms are frequently associated with a sense of constriction of the thorax, cramp of limbs, and sense of general terror and distress, that show the intimate relations existing between this portion of the spinal cord and the centres above and below it. In the treatment of all visceral neuroses, it is almost an axiom to look last at the organ that seems disordered, and to fix attention, first on the general conditions of the nervous system of the patient, whether that condition be congenital or acquired; and secondly, on the region from which may have started the reflex irritation of the particular organ.

The important points in all neuroses are the abnormal influence of emotion, and the excitability of nerves and ganglia to reflex irritation. As the channel for the transmission of emotion is eminently a vaso-motor one, and as excitability to reflex irritation is evidence of deficient tone, it stands to reason that so-called sedatives are poor treatment. The tendency should be to give tone to the nerves and ganglia, vaso-motor and other; at first, perhaps, by ergot, by hazeline, by acids, by abundant food; and, later on, by iron, paying attention all through to mental influences.

In certain circumstances, a tonic treatment is not enough for reflex vomiting. A peculiarly difficult form to treat is the vomiting of phthisis, in which, presumably, irritation of the pulmonary branch of the vagus is carried to the medulla, and reflected down both on its gastric branches and on the phrenic nerves. This, even if very obstinate, may be met by hypodermic use of eucaïne, though the *rationale* of its effect is not well known. It may act by causing anæsthesia of the pulmonary branches of the vagus, or by rendering the centre of the reflex arc less easily excited. In the latter case, it may have a tonic effect by its constricting power over vessels.

It would not be right to call chorea invariably a neurosis. Some cases, and generally those the least amenable to treatment, depend on organic lesions; but, in the large majority of cases, no such lesion exists; and in them a sedative treatment acts very imperfectly, as compared

with a tonic. The salts of most of the metals are useful in this relation, and those of arsenic and zinc pre-eminently so. In low-lying districts with a damp soil, the consensus of large bodies of medical men is in favour of iron; and doubtless in this respect the particular therapeutical agent will vary with the surrounding circumstances; but the principle is the same.

Then, again, as to the imperfectly known neuroses of the extremities:

1. A tingling is met with of all the extremities, both hands and both feet; sometimes with a normal appearance of the skin, sometimes with a waxy blanching. It is a neurosis, but a neurosis depending upon a great variety of causes. The tingling is a reflex manifestation of irritation at a distance, in the stomach, uterus, intestine, etc.; perhaps sometimes from the peripheral nerves themselves, exercising a paretic effect either on portions of the cortical sensory area or on the cervical and lumbar bulbs, or on all these co-incidentally, or on the vaso-motor ganglia on the vessels themselves; or it may be due to deficient heart-power, and then is accompanied by the waxy blanching of the skin, and with more or less local loss of temperature.

2. Cases are met with in which both cerebro-spinal and sympathetic nerves are involved; and pain, heat, and vascular congestion alternate with pallor, cold, and absence of pain.

3. There is a state of semi-paralysis of the blood-vessels of the extremities, causing flushing of the feet, and generally pain and tenderness. Pain may precede the vaso-motor phenomena. The feet are more commonly affected than the hands.

4. There may be a great coldness of the feet, or of the fingers, associated with contraction of the vessels of the extremities. It is possible that this condition is closely allied to the first variety, and may depend on deficient *vis à tergo*; but it has been thought to be due to overexcitation of the vaso-motor centre.

5. A further stage of this, even if it may not be considered a separate variety, is one in which symmetrical gangrene is the direct result of contraction of vessels. In all these varieties, the vessels themselves are neither occluded nor diseased. It would be against experience to say that these neuroses occur only in patients who have inherited a neurotic tendency. They seem frequently to be set up by the circumstances of the environment. Some varieties are associated with dilatation of vessels, and in these the use of ergot and of nerver-tonics is essential; but in the forms that own a constriction of vessels, the opposite treatment would hardly be successful. Friction, gentle galvanic currents, tonics, the removal of the sources of reflex irritation, and a due regard to a sufficient *vis à tergo*, will do more than paralysing drugs, or even than the application of external heat.

In the same line of thought, much might be said on many of the neuroses; on exophthalmic goitre, which, in some of its phenomena, may be included in this category; on diabetes insipidus, often recovered from under ergot and galvanism; on vaso-motor insomnia; on heat-exhaustion and heat-fever, in the first of which depression of nerve force must be met by strengthening remedies, in the latter, the paralysis of heat-controlling centres by quinine; on the non-organic forms of angina pectoris, in which the recurrence of the attacks would be badly met by sedatives and antispasmodics.

A CASE OF HÆMORRHAGE INTO THE CRURA CEREBRI, WITH REMARKS.

By EDWIN RICKARDS, M.B. Oxon.,
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W. C., aged 64, was brought to the hospital from a lodging-house, where he had been for a fortnight. He was a very reticent man, seldom speaking to his fellow-lodgers, and he was addicted to drink. The day before admission into the hospital, it was noticed that he was unsteady in his gait, and that his right eyelid was partially dropped; it was, however, thought that he had been drinking. He went out into the town, and came back by himself. He needed no assistance in going to bed. The following morning, his right eye was closed, and the left eyelid drooped; he was very drowsy, and, when he tried to walk, he staggered. He was admitted into the hospital that day (February 3rd). Though drowsy, when roused he was violent in his language, and pugnacious, using his right arm far more freely than the left. He only spoke when questioned, and then generally answered incoherently. He would not take food, saying there was poison in it. There was a slight but decided loss of power in the left limbs. As far as could be ascertained, the reaction to faradism was the same on both sides of the body. There was a loss of expression on the left side of the face, and the conjunctiva of the left eye did not seem quite so sensitive as that of the right. The right eye was com-

pletely closed; between the eyelids on the left side, there was just a chink. The orbicularis palpebrarum acted well on both sides. He was too irritable to be examined further.

On February 4th, the left eye also was closed. He was more rational and tractable, and took food; in other respects, the same. He gave his right name. His head was always turned to the left side of the body, though he was able to move it freely. When the eyelids were raised, the eyeballs were seen to move freely in every direction; there was no strabismus; the pupils were equal, and acted to light and to accommodation; they were not contracted nor dilated. He could count fingers correctly with both eyes, separately and together. There was very slight but decided loss of motor power in the left limbs; he only used these limbs to make a special effort. When a hand of an observer was placed on any part of his body, he would exhibit great power with his right hand to remove it, and failing, he would then use his left hand, which comparatively possessed very little power. The sensibility of the left side was diminished, but not destroyed; the prick of a pin was not felt nearly so acutely on the left as on the right side. The tongue, when protruded, did not deviate to one side. The reflexes were normal; there was no ankle-clonus. Being asked if he had pain in his head, he put his hand to the back of his head. There was no pyrexia. He passed his urine in the bed.

From February 4th to February 14th, his condition remained unchanged. He lay in a semi-conscious, unintellectual state, with his eyes closed. He passed fæces and urine under him. When roused, he took food. His bowels acted only under the influence of large and repeated doses of aperients. On February 14th, he became comatose. On February 15th, he somewhat rallied. The limbs on both sides were flexed and stiff, but not rigid. The loss of power and sensibility of the left limbs was slightly increased, though he could move them and feel the prick of a pin. On February 17th, he passed into a state of profound coma, and died.

Post Mortem Examination.—The brain weighed 52 ounces. The membranes were thickened, especially at the base. There was not any excess of cerebro-spinal fluid, and the convulsions did not appear to be flattened; the vessels of the brain were atheromatous; no thrombosis or aneurysm was discovered. On section, the brain seemed congested, and its substance somewhat softer than natural. On laying open the lateral ventricles, they were seen to be dilated, and to contain over five ounces of clear fluid. On removing the fornix and velum interpositum, at the back of the third ventricle, and in the inner and upper part of the crura cerebri, a blood-clot was found. It was not symmetrically placed, the right crus being damaged by it to a much greater extent than the left. The clot occupied the inner half of the right crus, and extended downward to the locus niger; only the inner and upper fibres of the left crus being affected. The clot, situated beneath the iter or tertio ad quartum ventriculum, compressed to occlusion that canal against the corpora quadrigemina. There was no blood in that canal, or in the fourth ventricle. The anterior surface of the clot was free in the third ventricle, being covered by the ependyma only; the posterior border was about a line in front of the anterior edge of the pons Varolii. The clot measured from before back superficially $\frac{1}{2}$ inch, but below the surface $\frac{3}{8}$ inch; it was $\frac{3}{4}$ inch from side to side, $\frac{5}{8}$ inch from above downwards in its deepest part, namely, in the right crus. That part in the upper strand of the left crus was about a line thick in its thickest part. The central portion of the clot was of lighter colour, and less firm than the rest. There was nothing noteworthy about the other viscera, except that the lungs were congested, especially the left.

REMARKS.—In this case it seems probable that at first (February 2nd) the hæmorrhage was confined to the right crus, causing partial ptosis on the right side and unsteady gait, either by rupture of nerve-fibres or by pressure that the hæmorrhage subsequently (February 3rd) increased in that crus, producing complete ptosis on the right side, and extended into the left crus, giving rise to ptosis on the left side; that the mental condition was due to the accumulation of fluid in the lateral ventricles of the brain, caused by the upward pressure of the clot on the iter a tertio ad quartum ventriculum, the communication between the lateral ventricles and the spinal canal being thereby cut off, or by indirect pressure on the veins of Galen. It would seem phenomenal that the impairment of sensibility of the left side of the body was not greater, seeing how large an amount of the upper part of the right crus was destroyed, and that the hæmorrhage, by compressing the inferior strata of the right crus did not cause greater paralysis of motion on the left side. Doubtless the pressure on the inferior part of the right crus was not so great as it would have been, had the clot been enclosed in the crus. Its upper surface was not covered by fibres of the crus, and evidently during life the pressure from it was upwards, and tilted up the corpora quadrigemina.