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A Lecture ON EPILEPSY.

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EPILEPSY is a disease of which we know extremely little definitely, and with certainty nothing at all. We are up to a certain point agreed as to what cases are to be included under the term; we have much real and trustworthy knowledge as to the etiology of the disease; but its pathology is largely conjectural, and its treatment mainly empirical.

SYMPTOMS.

Epilepsy is characterised by recurrent attacks of general convulsion, attended with or preceded by loss of consciousness, usually sudden. This sudden loss of consciousness is perhaps the most constant feature of an epileptic fit. The convulsions vary in character, intensity, and duration, and may in *petit mal* be represented only by fixation of the eyes and features, with, perhaps, dilatation of the pupils, or by slight twitching of some of the facial muscles or of the fingers.

In true epilepsy these recurrent convulsions constitute the disease. The patient in the intervals enjoys such health as is natural to his constitution, and there are no symptoms suggestive of any affection of the nervous system. When we can refer the convulsions to a definite lesion of the cranial bones, or of the membranes or cortex of the brain, we are only too glad to remove the case from the category of epilepsy.

In a typical attack there is at the onset a peculiar cry, ending, when I have heard it, in a long expiratory groan, sudden pallor, loss of consciousness, and general tonic spasm of all the muscles, of which the groan is an expression. With the loss of consciousness is a headlong fall, sometimes in a constant direction in each attack, to one or other side, backwards or forwards, or preceded by certain movements, as, for instance, by a pirouette of three turns in a case in which I saw several fits, sometimes determined by the position in which the patient happens to be at the moment. The rigidity may last till the face becomes livid. It is followed by clonic spasms, usually at first one-sided, the face being distorted, the mouth drawn towards the convulsed side, the head and eyes jerked by a succession of spasms in the same direction, the jaw champing and froth issuing from the mouth, which may be bloody, from the tongue, also in convulsive motion, being caught between the teeth. Respiration is now laboured, noisy and stertorous, sometimes exhibiting the nasal stertor to which attention was originally called by Dr. Bowles. The countenance becomes purple and swollen, and the conjunctivæ injected. Similar clonic convulsions affect the other side, and the fit terminates in a series of synchronous general muscular spasms, the limbs being in an extended position. Minute petechiæ may be left behind as a result of the intense congestion. The urine is often passed and sometimes the fæces, at what period of the attack I do not know. The convulsions, as they subside, leave the patient in a profound stupor, at first amounting to coma, gradually shading off into sleep, from which the patient wakes up usually aching and sore from the muscular exertion, sometimes headachy,

confused, and stupid; sometimes much as after a night's rest and with no recollection of the attack.

After *petit mal*, which may consist merely of a momentary suspension of consciousness, with fixation of the features and staring eyes, there is no coma, but there may be maniacal excitement of extreme violence. Homicide has not infrequently been committed in paroxysms of epileptic mania.

There may be variations in any part of the picture without any special significance attaching to the character of the fit. The severity of the case is estimated rather by the frequency than by the violence of the attacks, more especially as regards the effects on the mental faculties.

The epileptic fit is often preceded or initiated by what has been called an aura, an odour, a flash of red or coloured light, a subjective noise, a sensation in the epigastrium or in one of the limbs travelling towards the heart; a comparison of the sensation to a breath of wind suggested the name of aura. The starting-point of the aura has been supposed to indicate the part of the brain in which the initial disturbance occurs. An epileptic fit may come on at any period of the twenty-four hours, and may seem to be determined by a great variety of circumstances. A favourite time for the occurrence of attacks is in the night, especially towards morning, and again soon after rising. A patient may suffer from nocturnal epilepsy for years without knowing it, and when a case first comes under investigation it is always important to inquire if the patient has been subject to bad dreams, has ever wet the bed, or has found the bedclothes or himself on the floor. There are cases in which the seizures take place at no other time. It is important to note that they rarely come on during exertion or excitement. This has a practical, as well as, perhaps, a theoretical bearing. We need not forbid epileptics to take exercise or to ride, or even to cycle in moderation. In this conclusion I am glad to have the concurrence of my friend, Dr. Buzzard.

CAUSATION.

In the causation of epilepsy the most important element is undoubtedly an inherent tendency in the nervous system. Epilepsy runs in families with other neuroses. It is common in idiots and often associated with a low type of nervous organisation, intellectual and moral, and with a misshapen head or some bodily defect or deformity.

This inherent tendency or predisposition is for the most part congenital, but it varies greatly in degree. In some cases it is so powerful that the attacks occur early in life, and in spite of every care and of the most favourable conditions; in others they take place only under the influence of some violent exciting cause, or when the general health has run down or the nervous system has been exposed to some deteriorating influence such as alcoholic excess, immoderate smoking, or sexual abuse. If we are to call by the name of epilepsy those cases in which recurrent attacks of convulsions are distinctly due to an obvious peripheral irritation ceasing on its removal, we must admit that epilepsy may exist without any inherent tendency in the nervous system properly speaking, other than such as may be generated by peripheral irritation. On the other hand, it is possible that a predisposition may lurk in the nerve centres, and never be brought out in the course of a long life.

I am not sure that sufficient importance has been assigned to the sensory nerves in the causation of epilepsy. It is more and more recognised that the sensory side of the nervous system is the dominant one. Sensory impressions are the initial nervous operations, all motor actions are in response to afferent impressions, and the sensations to which they give rise constitute the primary basis of all intellectual processes. We look upon the brain and nerve centres as the structures in which nerve force or energy is generated; but whatever

may be the nature of nerve force, it must be formed and liberated in the sensory nerve endings, or, rather, beginnings. The impulse here originated, which travels to the spinal cord and brain, and starts reflex action or is transmuted into a sensation, is as much a manifestation of nerve energy as the impulse which, coming down from the spinal cord, excites muscular action.

Nothing can be more clearly established by experience than the relation between painful dentition and convulsions in childhood. Convulsions which have been going on for hours may at once cease when the tense and painful gums are incised. Gastro-intestinal derangement, again, is a frequent cause of infantile convulsions. Cases also are related in which the expulsion of a tapeworm or of long round worms has been followed by the cessation of convulsions.

It is a generally accepted view that the sense of buoyant health or its opposite—a feeling of unaccountable depression—is dependent upon the impressions transmitted to the nerve centres from the great viscera, and it is reasonable to infer that since peripheral irritation, such as the instances just given, can give rise to recurrent convulsions, a persistent visceral derangement may possibly be a cause of epilepsy.

It is, perhaps, worth while referring to the remarkable fact that an epileptic fit can sometimes be averted, and even an incipient Jacksonian convulsion arrested, by a tight band bound round the wrist or arm. If a peripheral impression can produce such an effect in the way of inhibition, it may be inferred that impressions of another kind and degree are capable of generating a tendency.

While the tendency to epilepsy must be looked upon as chiefly inherited, it is not very commonly manifested in infancy or childhood. Cases occur in which the disease appears to be established by infantile convulsions, but infantile convulsions must not be regarded as constituting an epileptic tendency, since they may happen to children entirely free from neurotic inheritance, and who never subsequently suffer from nervous affections.

When infantile convulsions are followed by epilepsy it is probable that the brain has been damaged.

A noteworthy point in the clinical history of epilepsy is the frequency with which the fits begin to occur at puberty or during adolescence. So close is the association between epilepsy and this period of life, that when the first attack is much deferred and takes place in the adult, we look for some contributory cause which has brought out the latent inherited tendency, or suspect that we are dealing not with epilepsy as such, but with some morbid condition of which epileptiform convulsions are among the symptoms, syphilis in the young adult, cardio-vascular derangement, or degeneration after middle age. It is not necessary to dwell on the various causes of nervous stress and excitement incident to early adolescence.

When epileptiform convulsions set in suddenly and frequently at any period of life peripheral irritation of some kind may be suspected. One such instance in my experience was a necrosed terminal phalanx, the fits, previously frequent and violent, ceasing when the bone was removed. Another was a piece of glass embedded in the wrist in close relation with the median nerve; pressure on the spot at once brought on a convulsion.

PATHOLOGY.

In the absence of definite knowledge as to the causation of epilepsy, we fall back upon every kind of speculation and consideration which may throw light upon the problem which the disease presents. If we only knew completely and exactly what takes place in the nervous system when a convulsion occurs, we should have gained a step towards the comprehension of a disease, the most prominent feature of which is recurrent convulsions, though not perhaps any great advance since a convulsion is not the first, possibly not even the most important, element in an epileptic attack.

A convulsion is the result of an excessive and disorderly liberation of nerve energy, as an ordinary purposive action is the result of a duly limited and orderly nervous discharge. This nerve force is generated in and by nerve cells or by reaction between the cells and the intercellular plasma; in any case, it is through the cells and their axons that the energy is conveyed to the muscles.

We do not know the precise nature of this force, but it can

only be a transformation of forms of energy with which we are more familiar, and everything points to a chemical change of the nature of oxidation as its source. From the fact, indeed, that oxygen seems to be absolutely necessary to the functional activity of the cerebral cortex, it would almost seem that here the oxidation was direct, but such is not the case in the same degree in the grey substance of the spinal cord.

Another point which we may infer with regard to nerve force is that it must be characterised rather by intensity than by quantity; its electrical analogue will be the spark of static electricity rather than the galvanic current. The chemist cannot point with confidence to the products of oxidation of the nervous structures and estimate the amount of waste they have undergone from the exercise of their functional activity, as he can in the case of muscle. Another consideration pointing in the same direction is that there must be some quantitative as well as qualitative relation between the chemical process by which nerve force is set free and the substances by which this process is influenced. It is not simply by its presence in the blood that hydrocyanic acid at once arrests the evolution of nerve force in the vital centres of the medulla, or that morphine more gradually suspends the functional activity of the cortex, and ultimately of the lower centres. A fatal dose of prussic acid being equally distributed in the blood, only an incalculable minute proportion can be carried to the medulla; and in whatever way it interferes with the chemical changes by means of which the nerve force is evolved, it affords a means of estimating the amount of chemical change and of showing that quantitatively considered it must be extremely small.

From whatever point of view the evolution of nerve energy is considered, the conclusion suggested is that in the grey matter there is accumulated a substance of an explosive character, ready to liberate energy not by gradual combustion like coal, but by a sudden readjustment of chemical affinities, as in the case of nitro-glycerine.

The passage of an electric spark through a mixture of oxygen and hydrogen will give rise to a violent explosion. The gradual burning of like volumes of one gas in the other will liberate an equal amount of energy, but gradually. An explosive compound such as nitro-glycerine may be said to consist of carbon, hydrogen, and oxygen in explosive proportions, held apart by combinations into which nitrogen enters, which defeat their natural affinities. Let any condition be applied which destroys this restraint—flame in the case of gunpowder, percussion in the case of gun-cotton—and the normal affinities assert themselves with explosive violence. A piece of gun-cotton will burn harmlessly on the open hand; fired by a percussion cap it would blow the hand to pieces.

A convulsion, then, represents an explosion of nerve matter—that is, a more or less general discharge of the explosive material accumulated in the grey substance of the cortex of the cerebrum or cerebellum or of the central ganglia. A question which at once arises is how such discharge is determined; and here experiment gives us the usually contradictory suggestions, while clinically it occurs under the most diverse conditions.

Convulsions attend death from loss of blood and from suffocation; we may have them at the invasion of almost any of the acute specific fevers, and they are common in disease of the kidneys; they may mark the onset of acute inflammatory affections of the brain, or occur at almost any period during their course, or as part of the final symptoms. Convulsions, again, may be excited by peripheral irritation—as in teething of children already referred to. It is difficult to draw trustworthy inferences from such diverse premises, and there is not time for any such discussion as might serve to establish even provisional explanations. It may be stated, however, that the experimental methods by which convulsions are induced have in common arrest, more or less sudden, of the cerebral circulation. It will be remembered that Hughlings Jackson attributed convulsions to spasm of the cortical arterioles; and I may, perhaps, add that for many years I have held the view that uræmic convulsions are due to stoppage of the circulation in the cortical capillaries and not to the direct action of any poison.

There remain the definite indications of Jacksonian epilepsy

and of the experiments of Hitzig and Ferrier. There can be no question that electrical stimulation of the cerebral cortex and of various subcortical grey centres can excite muscular actions, local and general, and nothing is better established than the causation of convulsive movements of a part by a lesion of a cortical centre. A local convulsion traceable to such a lesion may also become generalised with loss of consciousness.

The explanation of epilepsy to which the foregoing considerations lead up is that the explosive material in the cortical grey matter or other important collections of grey substance is unstable, and goes off too easily. It is this inherent instability—the liability to explosion without adequate exciting cause, perhaps even spontaneously—which characterises epilepsy and distinguishes the epileptic convulsions from convulsions determined by some violent external cause.

It is sometimes assumed that a convulsion exhausts the explosive matter in the nerve centres, and Dr. Hughlings Jackson has spoken of the coma which follows an epileptic seizure as paralysis from such exhaustion. This view seems to me to be disproved by the status epilepticus where one convulsion succeeds another for many hours with intervals of unconsciousness.

The periodical recurrence of the fits at almost regular intervals, irrespective of any apparent provocation, is suggestive of accumulation of the explosive nerve substance up to an amount beyond the control of the normal inhibitory influence. It might be, on the one hand, defective constitution of the nervous material, or, on the other hand, imperfect inhibitory control.

Mostly it is an inferior quality of nerve substance which is formed, and the instability is evidently a result of malnutrition. It is conceivable, however, that it may not be the formation of a low grade of nerve substance, but of too sensitive a type of explosive material. Possibly in this we have some sort of explanation of the undoubted fact that men of genius—military, literary, and scientific—have been epileptics.

NIGHT AND EARLY MORNING ATTACK.

It has already been mentioned that the fits of epilepsy are extremely liable to come on during the night or in the early morning or soon after rising. This is highly suggestive of cardio-vascular conditions as among the influences by which the time of an outbreak is determined. It is at about 4 A.M. that the temperature of the body is lowest, during sleep the circulation seems to run down and the vascular pressure to fall. In cyclic albuminuria, which is most common in adolescents, it is the change from the recumbent to the erect position (with perhaps exposure of the skin) that determines the appearance of albumen in the urine, and if such change of posture can so far affect the circulation in the kidneys, it may influence in an even greater degree the circulation in the brain. This fact is at any rate evidence of the lowered tone of the cardio-vascular system during sleep.

PROGNOSIS.

The prognosis in a case of epilepsy turns mainly on the question how far it is due to a tendency inherent in the nervous system, how far to causes outside the nervous system which might either generate or aggravate the tendency, or, the tendency being there, provoke attacks.

Heredity will enter very powerfully into the consideration. It is not necessary, however, in order to come to an unfavourable conclusion, that there should be a family history of epilepsy. Insanity, alcoholism, marked eccentricity, vice, perhaps even hysteria or migraine in parents or near relations, may be evidence of hereditary instability.

If, with the liability to recurrent attacks of convulsion, there are other evidences of a low type of nervous organisation, such as idiocy or weakness of intellect, or moral depravity; if there is any faulty construction of the cranium, if the head is too large or too small, or if there is the expression which we recognise and call epileptic, there is practically no chance of the cessation of the attacks.

If, again, the fits have begun in childhood, or at or soon after puberty, and have recurred regularly and frequently, whether or not there have been other injurious influences at

work, it may be concluded that an inherent tendency to instability exists.

If, on the other hand, the patient has the look of bodily and mental vigour, if some serious exciting cause has preceded each attack, if the fits have not begun till late in the period of adolescence or till adult age has been reached, it may be presumed that the inherent tendency to epilepsy is not strong, and that it may possibly be held in abeyance.

Very important indications also may be furnished by the state of the circulation. Prolonged observation has convinced me that the tension of the pulse is unduly low in epileptics. This low tension pulse I have come to consider as a characteristic of the disease. It is a part of the general sluggishness of the organic operations like the pallor which is common and the dull complexion and flabby skin. Whether the deficient arterial pressure is a cause of the malnutrition of the nervous centres, or a mere consequence, its significance is the same and it is an unfavourable prognostic indication. A pulse of unduly high tension for the age of the patient, on the contrary, is a ground for hope of recovery. More than twenty years ago a boy, the son of an army medical officer, who had had to leave the navy on account of epileptic fits, was brought to me. He had a high-tension pulse and exhibited no signs of bodily or mental weakness. I ventured to give a favourable opinion as to his future, and when a year or two had passed without a fit, his father's influence secured permission to enter the army. I met this patient accidentally last year in excellent health. He had only had one attack after he joined the army; this was during one of the Afghan campaigns under circumstances of great fatigue and privations and it did not interfere with the discharge of his duties.

TREATMENT.

In all cases the epileptic should have an open-air life as far as possible, and should be provided with employment in which he can take an interest and occupy his time. Nothing could be more satisfactory than the experience of the Epileptic Colony, near Chalfont, and in the much larger establishments in Germany and America.

Exercise of almost every kind may be permitted. Attacks rarely come on during exertion, and I have not hesitated to allow patients to ride. I am not quite so confident with regard to cycling, though I have never heard of an accident attributable to a fit, and I should only permit of swimming under competent supervision. The fear with respect to games is not of an attack at the time but during the reaction afterwards and especially next morning.

A very important question is whether an epileptic boy or girl should be allowed to go to school. Unless the fits were frequent I should answer in the affirmative, particularly as regards boys. The grounds on which hesitation would arise would be the effects on other children of witnessing a fit and the dread of its being known that the child was an epileptic. Both considerations would apply more seriously to the case of a girl; it would tell more against her in after-life, and girls are more susceptible to violent nervous impressions than boys.

Epileptic children and young people should be very carefully dieted, but not, so far as my opinion goes, on any particular or peculiar principle. The food must be adjusted to the digestion of the individual, the object to be held in view being to keep the general health at its best. Overfeeding should be strictly avoided, and the evening meal should always be light. It must be borne in mind that constipation or flatulence may bring on a fit, and the wholesome neglect of trifling derangements of the digestion to be recommended in healthy adolescents is not permissible when dealing with such as are subject to epilepsy. No stimulants should be allowed. It is doubtful whether they are ever of any service; and there is always the danger that the unstable nervous organisation may fall under the influence of alcohol.

The first point to be determined will be how far the case is one in which the inherited tendency is dominant and in which palliation only is to be looked for, or whether a hope of complete recovery may be entertained. But even in the most hopeless cases we should study the general constitutional conditions and the functional efficiency of the different organs. Exciting causes should as far as possible be identified. In

one constipation may be found to determine an attack, in another imprudence in diet, indigestible food, heavy or late meals. The menstrual period may be attended with attacks before, during, or after, even when quite normal; still more when menstruation is irregular or attended with severe pain is it liable to provoke fits.

The treatment of epilepsy, for the most part, resolves itself into the routine administration of bromides, just as the mere discovery of a cardiac murmur is too often the signal for giving digitalis or strophanthus. Whether the attacks are severe or slight, attended with violent convulsion or consisting of a momentary suspension of consciousness, whether the intervals are long or short, the rule is to give bromides. The potassium bromide is the most efficacious but it is depressing, and ammonium, sodium, and of late years strontium bromide, are had recourse to, singly, or more frequently in combination. It is not to be denied that the bromides have a marked influence in reducing the frequency and violence of the attacks, or that this is a great gain to the sufferer, but in no disease is it more true than in epilepsy that to relieve symptoms is not necessarily to cure the disease; and the question arises whether the relief of symptoms, the diminished frequency and mitigated violence of the fits, may not in many instances be too dearly purchased. That such is the case is distinctly my opinion. An almost more important consideration even than the depressing effect on the sufferers themselves is that the ready routine method of dealing with epilepsy interferes most seriously with the study of individual cases.

We are familiar with the bromide rash, and an attempt is commonly made to obviate its eruption by arsenic. Less conspicuous and attracting less attention, though infinitely more important, is the lowered tone of the nervous system, the loss of energy and of memory, the lessened efficiency, the depression of spirits and impaired enjoyment of life. I have seen patients reduced to a condition of practical dementia by long-continued dosing with bromides, and when the attacks have ceased it has seemed to be because the nerve centres had no longer energy sufficient for an attack. Julius Cæsar and Napoleon are said to have been epileptics; I am quite certain they would not have won their battles or left such a mark in the world's history if they had been energetically treated by bromides. It may be added that large doses of bromides have been found experimentally to affect unfavourably the dendrons and gemmules of the cortical cells.

A very important question is here suggested: What is the ultimate effect of postponing the fits? One view is that each attack predisposes to others, diminishes the resistance to the outlet of nervous energy along certain channels, tends to the establishment of a habit. Some sort of support is lent to this view by cases in which the fits tend to occur in groups or series; but there can be nothing of the kind in cases in which a single attack takes place at long intervals, say of months, and, according to my judgment, a general survey of the disease indicates not so much a liability to the outburst of nerve energy from deficient resistance along certain paths as to the formation of an unstable nerve substance by malnutrition. What we have to aim at is not to dull the sensitiveness of the nerve centres, but to increase their vigour and stability.

The idea on which I base my practice in regard to the treatment of epilepsy is that the use of the bromides is to diminish the frequency and severity of the fits, while the cure of the disease, the removal of the instability of the nervous system, is to be sought by other means. Occasionally the instability of the explosible nerve substance may be due to some visceral irritation, especially perhaps ovarian, and protection from this by the diminished sensitiveness to external impressions which is produced by the bromides may allow the nerve centres to regain their equilibrium, or give time for the subsidence or removal of the disturbing influence. It is also possible that if a brain had not originally any considerable inherent epileptic tendency, but had acquired the liability from some of the varied influences which lower the nervous tone, the prevention of the fits might afford time for the repair of the injury done by the adverse conditions. But for the most part there will be functional derangements or states of imperfect nutrition which may be dealt with in the intervals. I think there is a possibility of more harm being done by the

bromides in the intervals by a deteriorating influence on the brain than the mere postponement of the attacks would be worth.

The rules, then, which I lay down for myself are somewhat as follows:

In what I call long-distance epilepsies, in which the intervals between the fits are six weeks or over, I do not give bromides regularly and continuously unless there is some other indication for their employment, such as sleeplessness or excitement. If the attacks recur punctually at definite intervals I should try to avert them by a short course of bromides when they were due. In any case, if the patient has premonitory symptoms which he recognises, he should be instructed to take bromides as soon as they come on. If, again, he is aware that an attack is liable to follow any special incident in his life, exertion, excitement, worry, such social events as a concert, theatre going, or dinner party, he may try to baulk it by bromides.

When the fits are frequent, and especially when it is clear that the bromides exercise a restraining influence, they must be given in such amount as may be found necessary and at such hours as may be suggested by the time at which the fits are liable to occur. In particular a dose will be given at bedtime when the attacks come on in the night or early morning. Even here, however, the time gained between the fits should as far as possible be turned to profit. We should not rest content with the diminution of the attacks, but should endeavour to discover and remove the underlying cause.

It appears to me that there is an opening for fruitful inquiry in those cases in which the attacks are nocturnal, and again in those in which they occur soon after rising. Clearly here there is cardio-vascular instability which reacts upon the nervous instability, and it would seem to be a reasonable anticipation that by moderating the running down of the vascular tone which takes place during the night the liability to attacks would be diminished. This is a course of observation which can only be carried out by the family medical man or by the resident officers of an institution. A teacup of hot and strong beef-tea might be given at bedtime, or a glass of hot milk. In the case of morning attacks this might be taken immediately on waking, and at this time cayenne or pepper might be added to the beef-tea, or perhaps a little spirit or ammonia or something pungent to the milk. I should infinitely prefer food to drugs; but, food failing, a dose of digitalis or other cardio-vascular tonic at night; in the morning, perhaps, nitroglycerine might be given.

In seeking to apply remedial measures, as distinct from the prevention of the fits, we must first inquire carefully into the patient's habits and mode of life, and put a stop to anything which is adverse to health, or especially which may exhaust the nervous system. Irregular meals, late hours, sedentary habits, self-indulgence of every kind, especially such as is vicious. Discipline is of the greatest value. The genuine epileptic is usually deficient in will power, and needs the outside help which is comprised in the term discipline. But I need not dwell on these general measures, though they are of great importance.

We must next ascertain whether there are any persistent functional derangements, and a thorough physical examination of the chest and abdomen ought to be made. Constipation must not be permitted, still less loose and irregular action of the bowels. Indigestion, especially when associated with flatulence, must be corrected. All abdominal uneasiness must be looked upon with suspicion, as must any irregular distribution of the gases in the stomach and intestines, or general distension of the intestinal canal. The urine will of course be examined, and not merely for albumen or sugar, but as affording evidence as to the general condition of the patient.

Disorders of menstruation may play an important part in epilepsy. It does not follow that because the fits in any given case occur chiefly at the menstrual period, which is otherwise normal, the epilepsy is of ovarian or uterine origin, but, on the other hand, ovarian irritation or dysmenorrhœa or other derangement may be responsible for attacks taking place at any time. I cannot of course go into the treatment required by this class of cases.

There remains the question whether anything can be done to improve the stability of the nervous centres by such remedies as are known to be of service when the nervous tone has been impaired, or when the functional activity of the brain has been disturbed by conditions of the circulation.

I have already stated that in epilepsy generally the pulse is small and the arterial tension low. Exceptions occur, and in my experience, when a young epileptic has a pulse of unduly high tension, the prognosis is favourable. The tension can be brought down by care in diet, and by eliminants. In post-hemiplegic epilepsy, again, when the pressure within the arterial system, which has resulted in the rupture of a cerebral vessel, persists, the frequency of the fits can be materially reduced—I think I have seen them kept off altogether—by keeping down the pulse tension, which can best be effected by mild mercurial aperients.

For the generally lowered vitality of epileptics I have given phosphorus and the hypophosphites, or arsenic with strychnine or quinine, and sometimes iron. I am disposed to think that the arsenic, which is often given at the same time with the bromides to prevent the rash, may sometimes have a considerable share in the production of good results. I cannot say definitely that I have seen cures, because in consulting-room practice we cannot follow up patients who recover, but I have seen many instances of remarkable improvement, the fits becoming less frequent and severe month by month. A satisfactory feature of such treatment has been the increased sense of well-being and enjoyment of life which has attended it, the improvement of the memory, and generally increased intellectual efficiency. This has been particularly noteworthy when bromides which had been taken for some time were left off.

Epilepsy will repay further study. Jacksonian convulsions have been differentiated from true epilepsy; the recurrent convulsions caused by local or general thickening of the cranial bones of traumatic or idiopathic origin ought to form a distinct category, and I think that further distinctions will be established, so that we shall speak of the epilepsies rather than of epilepsy. The different forms will then have each its own treatment. It is because my thoughts have moved in this direction that I have brought the subject before you.

A BRIEF HISTORY OF THE OPERATIONS PRACTISED FOR CANCER OF THE BREAST.

By SIR WILLIAM M. BANKS, LL.D., F.R.C.S.,

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In this present age we consider that we live very fast, but, if we turn to the books and newspapers of the beginning of last century, we shall find that our ancestors a hundred years ago believed that they lived at a very rapid pace, while our descendants at the end of this century (when there will be Saturday to Monday cheap excursions to Mars) will look with pitying amazement on the poor old things who vegetated their lives away in 1901. But it must be admitted that the acute rush of life of the present day has come with rather startling suddenness upon us. It is essentially the product of the railway, the telegraph, and the telephone, and, as such, it has occurred during the lifetime of men who are not so far past middle age. So that plenty of us are capable of judging whether this very rapid advance has in every respect been a salutary one. For it must always be remembered that in all Nature the principle of slow growth and long life, of rapid life and speedy extinction prevails. This rule holds good with regard to a man's reputation. Formerly a surgeon took time over his work and thought about it and made sure that it was sound and would stand the test of trial by his brethren. After that fashion worked Syme and Simpson, Christison and Bennett, Graves, Stokes, Paget, Lister, Murchison, Wilks and all those men who have been the real makers of modern medicine. For they and their fellows of the same stamp

planned the structure and laid its foundations, being ignorant of the meaning of self-advertisement and solely intent upon the production of sound and true work. It is a question whether the same fine spirit is animating us now, for praise seems accorded only to the most recent and most obtrusive discoverer, whose discoveries are at the end of six months too often relegated to limbo.

It is due to this state of feeling that there has arisen a complete revulsion from the condition of matters which prevailed in our profession down to the beginning of the 18th century. Till that period a blind and unreasoning worship of the doctrines of the great men of the past was universal. This veneration, moreover, was of the most bigoted and intolerant kind. One cannot obtain a better glimpse of it than by reading the life of Ambroise Paré, and seeing how he was tormented by Gournemelen, the Dean of the Faculty of Medicine. As Mr. Stephen Paget in his life of Paré says, referring to a book on surgery published by Gournemelen, "This book is an idiotic appeal to authority and tradition; the very thing that Paracelsus would have liked to burn. The rest of Paré's answer to Gournemelen is no less emphatic, showing the wonderful vigour and spirit of his old age. He appeals once and for ever from tradition to experience; he will show this *petit maître*, this ass, what it really means to be a surgeon." The unfortunate thing is that the pendulum has swung so far in the opposite direction that it is the man who appeals to experience who is now considered the ass. The idea is that there is no time to attend to persons who mildly plead long experience as a reason why they should be heard. Nothing is worthy of consideration if it is more than eighteen months old. To use the vulgar phrase of the day it is not "up to date," which phrase is too often synonymous with crude and hurried and superficial. When a man takes to critical moralising people say at once that he is a grumbler. I admit the soft impeachment, and what I venture very gently to grumble at is a leading article in the BRITISH MEDICAL JOURNAL for November 16th, 1901, entitled Operations for Gastric Ulcer. A paragraph runs thus:

Twenty years ago, and even more recently, it was considered, in operating upon the breast, for example, that the whole malignant growth should be removed, the incision being made at a short distance from the margin of the tumour in supposed healthy tissue. The researches of Stiles, Heidenhain, and Rotter, and the operation of Halsted founded upon them, have entirely revolutionised that procedure. It is now accepted that, however small the primary growth may be, it is essential that the whole breast, the lymphatic vessels draining the breast, the chains of glands into which the vessels pour, should all be taken away. So the modern and the ancient operations may be contrasted. In the latter the tumour itself was excised, and, as an extreme measure, the glands, if felt to be enlarged, were removed through a separate incision; in the former the tumour, the whole of the breast in which it lies, the whole of the lymphatic system, vessels, and glands accessible, are mercilessly cleared away by patient dissection. Of the improved results that have followed this wide removal all surgeons are, we believe, convinced.

It must be obvious that there can be only one interpretation of this paragraph—namely, that until Dr. Halsted brought out his operation, founded upon the microscopic researches of the three other gentlemen mentioned, there had been no improvement whatever upon the old method of removing the growth by incisions made at a short distance from its margin through supposedly healthy tissue. I cannot but notice the perseverance with which this statement is being constantly reiterated, for in the BRITISH MEDICAL JOURNAL (April, 1900) I thought I had produced sufficient evidence of its extreme unfairness. But here it crops up again, Stiles and Heidenhain being now reinforced by one Rotter. So I am a second time compelled, greatly against my own inclination, to review the position.

It has occurred to me, however, that to look back and see what the surgeons of old thought and did in the matter of cancer of the breast might have some little interest from the antiquarian point of view. Hildanus, in 1646, in his *Observationes Chirurgicae*, writes a letter to his friend Dr. Andreas Weickius upon the Excision of Tumours of the Axillæ and the Removal of the Breasts. Under the former head he makes some most sensible remarks:

But before everything we must carefully make out whether the tumour can be shifted and moved from one point to another, and whether it can be radically excised. For the operation will be fruitless if any part of the tumour, however minute—nay, even the membranes in which tumours of this sort are usually enveloped—be left behind. For the disease sprouts up again, and becomes more malignant than ever, while there is no hope that we can remove what remains behind by cauterising.