nitrate of potass, given with the bicarbonate and nitrous ether, converted into draughts of effervescing citrate, by means of lemon-juice. If there be much red sediment in the urine, an ample allowance of beef-tea, to which a few drops of the liquor potassæ have been added, must be freely administered, with solution of quinine, as soon as the febrile symptoms have lessened, and the urinary secretion has been partially restored. The patient, unless plethoric in habit, must at the same time have plenty of nourishing but anti-bilious diet; and when vascular action is of the asthenic type, an allowance of wine may be necessary. The age, strength, and habits of the patient must also be taken into account. Occasionally both local and general depletion may be necessary. The first can be best effected by means of cupping-glasses, or the scarifications may be effected with the point of a lancet, as practised by Sir R. Dobson. If the disease be of the phlegmonoid kind, and the extent of sero-fibrinous exudation threaten suppuration or the vitality of the part, incisions of from two to three inches in length must be practised, to relieve the strangulation. Various local applications are made use of by various practitioners, such as fomentations of poppy-heads, collodium, solution of sulphate of iron, &c.; but in this disease, as in rheumatism, I have found nothing better, as a lotion, than camphor mixture, with a proportion of vinegar and tincture of opium, applied warm, by means of lint, and then covered with oiled silk or French wadding. Both in rheumatism and in this disease the lotion now recommended will be found useful in relieving the local symptoms, provided proper constitutional means are employed at the same time.

SOME PHENOMENA OF THE INTER-PAROXYSMAL CONDITION OF EPILEPTICS,

AND THEIR RELATION TO TREATMENT.

By J. RUSSELL REYNOLDS, M.D. LOND.

(Concluded from p. 102.)

THE *second class* of cases is formed by the presence of more or less marked change in the intellectual powers. This field is so wide that I can do little more than mention some of the most prominent objects it contains. By far the commonest and earliest change is *loss of memory*. At first it is noticed only with regard to the trivial matters of the day; whilst those long since passed are readily recalled. Subsequently, the patient forgets the earlier elements of his knowledge, and his mind then becomes an utter blank. The progress of deterioration resembles, in many respects, that which is natural to the decay of human life; often, as it were, anticipating the work of time, and hurrying a just opening life into a premature old age, with all its feebleness, and more than all its gloom. Failure of memory (except when occurring only as the immediate sequel of severe attacks) is commonly attended with diminished power of apprehension; and this is at first most marked with regard to new ideas, but, subsequently, appears to affect the mind in relation to previous knowledge, diminishing the power of applying past experience to the new circumstances of daily life. The patient cannot, or frequently does not, concentrate his thoughts upon any subject. Ideas follow one another, it may be in very rapid succession, as they are accidentally suggested by one another, or by surrounding events. When this power is only slightly deteriorated, the mind may be recalled by a strong effort, or a powerful impression; but when the intellectual disease has advanced further, this becomes impossible, and incoherence of expression indicates but too plainly the incoherence of thought, which may pass still further into utter fatuity.

These earlier mental changes resolve themselves mainly into defective volition. The first failure of memory is due to want of attention rather than to anything else. The individual does not sufficiently attend to what is going on for deep impressions to be made, and consequently there is no power which can recollect them. Attention appears to be simply the direction of consciousness by an effort of volition; and in this first failure there is the first indication of diminished will. Probably the loss of apprehension has its origin in the same cause; it is the consequence of neglected or not properly exercised attention. By simple disuse, the power becomes diminished. The same thing is to be observed with regard to thought. The associations, which in mental health form the basis of correct

judgment and logical appreciation, from having their ground in the truest relations which we can discover between separate ideas, are lost altogether, or are replaced by associations of a merely accidental, or inessential character; and thought becomes incoherent, or "wandering," from the deficiency of voluntary power exercised in its direction and control. Thus, with deficient volition, and with increased readiness of emotional disturbance, the epileptic is reduced to a mere machine played upon by every external impression, or suggested feeling, and without any power to appreciate, account for, or control his state.

It may be said that some epileptics give evidence of most powerful and determined will. History furnishes the record of some of the world's masters who were epileptic, and I have seen some cases marked by great so-called self-willedness and determination; but these appear to be exceptions, and to be more readily referable to obstinate or pertinacious clinging to an idea, for which very frequently the individual can supply no reason. It is, as he says, an impression which guides him, not a duly-formed volition, and an impression which he will admit to be as frequently wrong as right. There are doubtless some cases in which no abnormal deficiency can be detected; but many individuals, in whom excess of determination might be at first sight supposed to exist, in reality possess a volition defective in its highest function—viz., the control and direction of their own minds.

The question at once arises, with regard to the failures which have been mentioned, whether they are not simply the consequences of attacks? In order to answer this question, let us remember the large class of cases in which no such mental deterioration could be discovered; and yet farther, that the degree of intellectual weakness bears no constant proportion to the severity, frequency, or duration of the fits, as the following numbers show. They represent the first twenty cases of which I have the record, and they are taken, therefore, indiscriminately. Eight presented marked cerebral failure; twelve did not. Of the eight in whom the memory and other faculties were deteriorated, the disease had existed from one to five years in four, from five to ten years in three, from ten to fifteen years in one; whereas of those in whom the mind was healthy, the disease had existed from one to five years in three, from five to ten years in two, from ten to fifteen years in three, from fifteen to twenty years in one, from twenty to twenty-five years in two, and upwards of forty years in one. The question of mental failure is not to be resolved, then, into one of duration of the disease. I have examined this question very carefully in all the cases which have fallen under my notice, and the result is, that in almost every case in which the mind was severely impaired, this impairment was noticeable from, or very soon after, the commencement of the disease, and increased steadily as the disease advanced; and the probability is, that those who have not after a few attacks evinced any mental failure, will not do so to any marked degree, even after many years have passed. In some cases, the mind had suffered seriously before any convulsive phenomena presented themselves. In one case, ridiculous ideas, and even distinct delusions, existed for nearly two years, at the end of which time a convulsive paroxysm occurred, and the patient has since become a confirmed epileptic. In another, occasional aberration occurred for six months, and was then followed by two or three epileptic attacks, from which, however, and from his mental disturbance, this patient has now happily recovered. In a third case, decidedly maniacal attacks took place, not either immediately before, or immediately after, the fits, but in the intervals between them, and sometimes they appeared to alternate with the convulsions. Instances of variations might be multiplied indefinitely, but I feel convinced that when an epileptic presents mental failure or derangement, it is not so much the result of the paroxysms to which he has been subjected, but the effect either of the epileptic conditions themselves, or of some morbid processes developed coetaneously with them.

In endeavouring to estimate the real value of deficient volition in the development of the epileptic diathesis, we enter upon a most difficult task, but one with regard to which I will be as brief as possible. It is plain, from the history of cerebral diseases, and from physiological experiments, that the complete removal of volition does not necessarily induce convulsions. It is commonly believed, and many facts appear to warrant the belief, that such removal enhances the probability of their occurrence.

Many authors speak of an antagonism between the cerebral and spinal, the voluntary and involuntary functions, and quote this antagonism to account for the occurrence of convulsive phenomena when consciousness and voluntary power are lost.

But is this antagonism a reality? Time will not allow me to state more than the conclusions which I think we may form upon this point, and I will venture to do so in a propositional form.

1. Those reflex actions which are normal in character—e. g., deglutition, &c., are not opposed by volition.

2. If attention is directed towards them, they become unnatural.

3. Volition may interfere with the conditions of stimulation, and so postpone the act; but,

4. If the appropriate stimulus is brought to bear, no amount of volition can prevent their occurrence.

5. Volition may direct, limit, or prevent many consensual, automatic, and secondarily automatic movements.

6. When volition is removed, ordinary—i. e., normal and physiologic—reflex actions, are not more readily induced; but,

7. Extra-ordinary—i. e., abnormal and pathologic—reflex actions, are induced much more easily.

8. Volition being normally active, there is a natural tendency to resist and prevent those movements which arise from abnormal stimuli, or which are pathologic in degree.

9. When there is undue readiness of excitation, the will endeavours to resist, (if it, the will, is normally active.)

10. If volition is normal, the attempt is more or less successful.

11. If volition is deficient, abnormal movements, when arising from abnormal stimuli, or from excessive pathological reflection, are not duly opposed, and thus their probability and intensity are increased. So that,

12. If, in addition to the first element of the epileptic constitution, (the characters marked in the first group of cases,) there is added the second, (noticed in the class which we are now considering,) such addition renders the first more severe; or, in other words, deficiency of volition renders the occurrence of abnormal involuntary movements probable, and increases their intensity when they do occur from a morbidly susceptible reflective centre.

A similar condition to that which exists in the a-volitional centres of motor impulse is found in the centres of sensation. There is in the latter an undue impressibility, as *muscae volitantes*, vertigo, tinnitus aurium, formication, &c., serve to indicate.

We have now to examine the *third class* of cases, those in which some change from the condition of *organic* health forms the marked feature of the inter-paroxysmal period. These cases are, so far as my observation has extended, much less numerous than the other two.

Some of these organic conditions are physiologic, others are pathologic. It is my intention with regard to the former, to point out only some of the physiologic conditions peculiar to each period of life. They are doubtless, in themselves, wise provisions for the individual's good, and in a perfectly natural mode of life and healthy constitution, their existence would scarcely be betrayed by variations from the normal standard; but from some causes, such as the artificial state of society and its results, these conditions are exaggerated, and become the germs of morbid processes. The habit of expecting, and of realizing some of these, has become so confirmed, that their presence is looked upon as natural—"a second nature" it must be owned. Allusion is made, of course, to the first and second dentition, puberty, pregnancy, parturition, and the climacteric period. It is exceedingly common to find that epileptics have had convulsive attacks during their first dentition, and the great fatality from such seizures during this period needs no comment. Many epileptics who have had attacks when less than two years of age, have been quite free until their second dentition.

When the permanent teeth have all appeared the attacks have ceased in some; but others, unfortunately, have become confirmed epileptics. An interesting case has recently fallen under my notice, in which a child had repeated convulsions when cutting the milk teeth; then enjoyed perfect health until the permanent molars appeared, when he again suffered repeated epileptic seizures for eighteen months. From twelve to eighteen years of age he was in perfect health, but was brought to me a few months since, having had two severe epileptic attacks. Upon looking into his mouth, I discovered great intumescence, and redness of the gums behind the last molar teeth in the lower jaw, evidently caused by the development of the *dentes sapientiae*. It remains yet to see what may be the course of disease when these teeth have assumed their proper position.

With regard to puberty, it appears that its influence has been somewhat overrated. There are very few cases in which I have been able to affirm that it exerted a direct effect upon

the development of the disease. In some cases, attacks, having commenced at an early period, have ceased when the menstrual function has been duly established; but in others no such beneficial effect can be traced. In some individuals, however, the commencement of epilepsy has clearly dated from the commencement of this curious periodic condition of the female organism, and then the attacks appear to be more or less connected with the menstrual *nisus* in after-life.

The influence of pregnancy is too complicated a question to be entered upon now; suffice it to say, that although in some cases there may be induced *urinæmia* as the proximate cause of convulsions, this is certainly not present in all.

The climacteric period bears much the same relation to epilepsy that the commencement of puberty does—i. e., one of uncertain character; and its influence, if any, is probably owing to some ulterior conditions of special derangement, which do not come under notice now. What there is common to these varied conditions is the simple fact of a *change* in the organic processes; and when we remember that the nervous system is, as it were, suspended in the midst of ever-shifting organic elements, and receives from their normal changes the stimuli which set up its due or physiologic actions, it is at once apparent that any unusual process must, from its novelty alone, occasion new nervous phenomena of varied character. That such new phenomena do occur is a matter of almost universal observation. When the individual is in perfect health, they resolve themselves into new sensations, new emotions, new thoughts, and some muscular contractions, which do not, however, pass the physiologic limits; but when these novel processes are attended with unusual organic disturbance, or when they occur in individuals whose nervous system is already in an unduly susceptible condition, their results too frequently become pathologic, and may set up habits of disease which sadden the whole of after-life.

With regard to the distinctly *morbid organic conditions* with which the epileptic constitution may be associated, the same general law is to be borne in mind. We may find *plethora*, on the one hand, *anæmia* on the other, and gathered around these two, almost every form of local disease and of general *cachexia*; whilst in some cases the organic processes are perfectly natural in their performance.

Rigors in the adult, and convulsive attacks in the infant, may be precisely similar when arising from an inflammatory process in any one of the three great cavities, or when occurring from the influence of some poison in the blood; so that the simple elements of convulsion do not appear to depend upon the peculiar nature, but upon the simple presence of organic change. On the other hand, every form of disease with which epilepsy is sometimes associated may occur without such complication; so that the organic conditions cannot, *per se*, be considered of essential or even important influence.

To resume: the epileptic presents in the inter-paroxysmal period the predominance of involuntary motility, very frequently notable diminution of the voluntary, and thus, between the attacks, exhibits phenomena of which the fit itself is but a more intense, it may be often extreme, development. The essential feature appears to be, undue readiness or susceptibility of induced or reflective nervous action. This is often aggravated by positively diminished will, and called into play by the stimulus of change in the organic condition.

Are these ultimate facts in the pathology of epilepsy? In the present state of science I think they are, but it is to be hoped that further research may indicate some more general conditions to which they may be referred. The blood has yet to be carefully examined in its physical, chemical, and vital properties, and it is impossible now to say what may result from this inquiry.

There are some healthy phenomena which, if they do not explain, may relieve the solitude of those we have been considering. Involuntary actions occur, as physiologic conditions, from simple reflection, from emotion, and from idea. When any violent effort is made, the thorax is involuntarily fixed, and respiration is suspended. Perception and volition are lost in sleep, and may be lost under the influence of strong emotion. And, farther, there is a tendency to the grouping of muscular actions, by which they become interdependent, and secondarily automatic. We have in these processes of ordinary healthy life many of the phenomena which appear so mysterious when brought suddenly together in the epileptic paroxysm.

With regard to *treatment*, the formation of these three groups may be of much service as our guide. When the signs described under the first head are strongly marked, much good is to be derived from sedatives, such as *hyoscyamus*, *cotyledon umbilicus*, *conium*, *cannabis indica*, and the careful inhalation

of chloroform in small but repeated doses. I have found the first and the last produce the most marked effect. Hyoscyamus may be given in the form of tincture, from ten to thirty minims three or four times a day; chloroform (from twenty to forty minims) may be placed on the handkerchief, and slowly inhaled every four or six hours. When the cerebral powers appear failing, judicious mental and moral training is certainly of great service. Whilst all undue excitement or over-fatigue should be avoided, much harm may be done by the patient being denied all mental exercise. He should be taught to cultivate the habits of volition, self-direction, and self-control, by due and appropriate exertion of his mind. With regard to organic conditions, special derangements require special medicines, diet, and regimen. Tonics are frequently of service, and my own experience leads me to place more confidence in the oxide of zinc and in the acetate of strychnia than in any other. Much is to be accomplished by alteratives, or such measures as will ensure healthy and abundant secretions. To avoid the possibility of gastro-intestinal disturbance, the most rigid diet should be enforced. With regard to the attacks, they may be often postponed, or put off altogether for a time, by the use of purgatives and alkalis when there is habitual constipation or gastric disturbance with acidity of stomach; and by hyoscyamus or chloroform when the signs of irritable reflective centre are predominant. In other cases the exhibition of a stimulant has the same effect, if there is great exhaustion from over-fatigue or any other cause. Still it is to be feared that there are many cases which will baffle all treatment directed according to our present amount of knowledge; but if we can relieve some, they inspire the hope that, with more advanced pathology, we may be able at some future period to confer the still greater benefit of more successful therapeutics.

Grosvenor-street, 1855.

THREE CALCULI IN THE BLADDER SUCCESSFULLY REMOVED BY LITHOTRITY.

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I SEND the following successful case of lithotritry for publication, as I think it will be interesting, the instruments employed in the operation being different from those commonly used in lithotritry in this country. I have given the symptoms following the several sittings with minuteness, for I find very few cases of the kind reported in detail:—

Isaac A.—, aged fifty-six, a well-made, healthy-looking man, was admitted into St. Mary's Hospital May 12th, 1855, under the care of Mr. Coulson. His occupation is that of heater in a foundry at Dundivan, near Glasgow, from which place he had come to London to be relieved from the presence of a stone in the bladder, or, at least, from symptoms similar to those experienced by a friend of his who had been operated on in London by Mr. Coulson, the operation performed having been that of lithotritry.

The history of the affection under which he is labouring is as follows:—His health has been generally pretty good. Ten years ago he suffered from pain in the loins, and could not put on his stockings for some time. The urine at that time deposited a good deal of gravel of a brown colour. This condition lasted about three months. Up to two years ago nothing referable to the urinary organs was noticeable. A short time previous to this latter date, he occasionally passed blood in the urine. A few months after the first occurrence of this event, he passed two small stones by the urethra, collectively equal in size to that of a small pea. Subsequently to this period he had laboured under symptoms indicating the presence of a calculus in the bladder—viz., pain before and after the act of micturition, frequency of that act, occasional discharge of blood mixed with urine, &c. The pain is chiefly felt after the act of micturition, and lasts ten minutes or so. He is able to get about pretty well; and his general health seems to be unaffected. The stream stops suddenly now and then.

These symptoms indicated the nature of the disease the patient was labouring under; and this opinion was confirmed by sounding the bladder. Mr. Coulson gave it as his opinion, based on an attentive examination with the sound, that there were three stones in the bladder, one of which was considerably larger than the others.

The nature of the operation to be performed had next to be considered. Mr. Coulson would have preferred the operation of lithotomy; but the patient did not acquiesce, and expressed his desire to have the same operation performed that his friend

had undergone—viz., that of lithotritry. The case was one favourable for lithotritry in many ways. There was no disease of the kidneys; no undue irritability of the bladder; the bladder was capable of holding without difficulty a tolerable quantity of urine; and the size of the stones was not such as to offer any insuperable difficulties in the way of crushing them. Added to this, the patient's health was good.

The state of the bladder having been ascertained as above, the patient was kept quiet for a few days, and in addition to the ordinary hospital diet, four ounces of gin was ordered to be given daily.

May 16th.—Mr. Coulson used the lithotrite for the first time. The patient was brought into the operating-theatre, placed on a bed, with the pelvis elevated, and resting on a firm cushion, for which purpose a round sofa cushion was found most efficient. A catheter was then passed, and the bladder emptied of its fluid contents. A syringe, capable of containing four ounces of water, was then adjusted to the mouth of the catheter, and the contents of the syringe thrown into the bladder. Mr. Coulson then withdrew the catheter, and introduced a large-sized lithotrite. The instruments used were made by Charrière, of Paris, a larger and a smaller one—the same as employed at present by M. Civiale, and capable of being used in three ways, either to crush the stone by the hand or screw, or for the employment of percussion. These instruments were, both on this occasion and at the subsequent sittings, found very effectual in producing the ends desired. The two projections at each side of the handle indicate precisely the position of the fixed part of the lithotrite—viz., the female portion. The male part is easily fixed, when the stone is caught between the blades, by turning a catch which projects against the screw a few turns of a female screw, and thus affords a point of resistance, from which the force used in crushing the stone by means of the screw acts. The lithotrite having been introduced, the larger of the stones was readily seized, and in part broken up. The smaller lithotrite was then introduced, well oiled, and a similar manœuvre repeated. The time occupied did not exceed five minutes, a point on the importance of which Mr. Coulson lays considerable stress. No blood followed the use of the instruments. A large catheter was next passed into the bladder, and the water drawn off. The syringe was then brought into requisition again, and the bladder washed out two or three times. A little warm wine-and-water was administered, and the patient removed to the ward, having expressed no particular complaint of pain during the operation. No detritus came away during the washing out of the bladder, as was, indeed, the case at the subsequent operations. When removed into the ward, he was ordered to take a draught, containing half a drachm of tincture of hyoscyamus, and one ounce of camphor mixture.

18th.—A tolerable quantity of gritty matter passed to-day and yesterday with the urine, and one piece, evidently a part of the outer shell of a large stone, of a quadrilateral form, and more than half an inch long, was passed to-day. The patient feels comfortable; the bladder is rather irritable, as might be expected. In the evening a slight shivering fit took place.

19th.—A second operation was performed to-day differing in no respect from the first. The operation was effected without producing pain in the true sense of the word, and without any emission of blood. After the operation, wine-and-water and twenty drops of tincture of opium were administered, and ordered to be repeated at bed-time.

The following day, the patient being a little feverish and restless, a dose of saline mixture with a little tincture of hyoscyamus was prescribed three times a day.

23rd.—The patient is better, but has very little appetite, and does not sleep very well. But few fragments of stone have been passed since the second crushing, and very little gritty detritus. A third operation was performed to-day. It was found that the calculi lay, for the most part, at the right side of the bladder, and towards the pubis, so that the concavity of the lithotrite had to be turned downwards and to the right side in order to seize them. This was, in the following operations, found almost invariably the favourite position of the calculi. One large calculus separated the blades of the lithotrite nearly two inches. No pain was experienced; no pieces came away during the operation. An opiate, with wine, was given as before, and ordered to be repeated at bed-time.

24th.—Last evening a very large piece came away, more than half an inch long and several lines thick, forming a portion of the outer surface of a large stone. During the night the urine passed involuntarily, and there is not perfect control over the orifice of the bladder this morning, this condition being, in all probability, due to the presence of some fragments at the vesical extremity of the urethra.