of Cambridge, a friend of the patient, who was present at the operation, kindly remained with him, and gave him twenty minims of laudanum with advantage. When I saw him in the afternoon, I gave him ten grains of chloral-hydrate, as I thought the diarrhoea was probably, like the frequent desire to micturate, spasmodic. I also prescribed thirty grains of chloral at bedtime, and hot flannels sprinkled with laudanum to the abdomen.

March 27th. The diarrhoea returned in the evening, but was checked by an injection of starch and laudanum. This also relieved the pain in the abdomen, and the patient slept after it for two hours. At 2 A.M., he had the thirty grains of chloral, and slept after this till nearly 6 A.M. Diarrhoea then returned again, but was checked by fifteen minims of laudanum. When I saw him at 3.30, I found him much more comfortable. He had had a little pain in the abdomen, which had been relieved by linseed-meal poultices. The tongue was cleaner; pulse quiet, 78; temperature 101 deg. Fahr. He was not so thirsty, but slightly flushed. I ordered milk and lime-water, and a bismuth and morphia mixture for the diarrhoea.

March 28th. He had one relapse of diarrhoea last evening, which bismuth mixture soon relieved. He passed a comfortable night without chloral or opiates.

From this time his progress towards recovery was uninterrupted. He was going about again on April 3rd, his temperature and pulse being normal. No increased liver-dulness could now be detected. Dr. Burrell and I again carefully examined this gentleman on May 22nd, and we could detect nothing abnormal about the liver. The patient expressed himself as feeling quite well. On June 9th, the patient wrote to me from Hastings, stating that he was still going on satisfactorily.

CASE II.—H. W., aged 16, an errand boy, living in Cambridge, was admitted into Addenbrooke's Hospital, under my care, April 5th, 1876. The lad had a healthy appearance, and gave the following account of his illness. He came of a healthy family. His own health was quite good up to four years ago, when he was in the hospital for a period of sixteen weeks, under one of my colleagues. His symptoms at that time were slight constipation, nausea, abdominal pain, and the presence of a hard lump at the epigastrium. He got stronger during his stay in the hospital, but did not lose the swelling, which seems to have been present ever since, but has given him no trouble with the exception of a little pain at rare intervals. Two weeks ago, he felt a settled pain and soreness in the centre of the epigastrium, and aching pain across the chest.

A large tumour of the size of a foetal head occupied the right hypochondriac and epigastric regions, and was apparently continuous with the liver. The surface of the tumour was somewhat nodulated. The tumour was very prominent and globular below the right ribs; the left half did not stand out so well, and was rather difficult to define; on it could be felt several small flat elevations, one of which was acutely tender. There was a loss of the elasticity of the ribs over the tumour. The tumour itself felt rather elastic, and moved up and down on breathing. No hydatid fremitus could be detected.

The case was diagnosed by Dr. Humphry and myself as one of hydatid of the liver. Accordingly, on April 9th, Dr. Humphry, at 11 A.M., introduced a needle of the aspirator into the tumour at a spot one inch below the point of the ensiform cartilage and three-fourths of an inch to the right of the middle line. Twenty-two ounces of hydatid fluid containing echinococci were withdrawn.

6 P.M. Immediately after the withdrawal of the fluid, the patient felt easier, and was soon quite comfortable. Pulse 94. Temperature, 99.2 deg. Fahr. Ordered beef-tea and milk.

April 10th. He complained of frontal headache and of being dizzy. He twice vomited a small quantity of thin, yellowish, bilious-looking fluid. He did not sleep much last night. Temperature, 99.8 deg. Fahr. Pulse 98. The bowels acted last night.

From this time, the patient went on satisfactorily in every respect. No urticaria followed the operation.

On April 15th, it was noted that the patient felt quite well.

On May 25th, the patient presented himself at the hospital for careful examination. The lad said he felt perfectly well. There was no pain nor tenderness over the region where the tumour had been; and careful percussion failed to reveal any enlargement of the liver. So far as one could judge, the cure was perfect.

REMARKS.—My remarks on these cases shall be very brief. In Case I, I at first could not make up my mind whether I had to deal with simple pleurisy, or with an enlarged liver complicated with pleurisy. When the pleuritic signs had diminished and the patient could bear a more careful examination, I came to the conclusion that the patient had, in all probability, hydatid tumour of the liver, for the following reasons. 1. The dulness reached further up in the front of

the chest than behind; whereas, in pleuritic effusion, we get usually the very opposite condition. 2. The line of percussion-dulness was depressed on deep inspiration, and moved upwards on expiration, which does not take place in cases of large pleuritic effusion. 3. At the base of the right lung behind, there was not that complete dulness and absence of vocal fremitus which are usually present in simple pleurisy. 4. Although the margin of the liver was not much depressed below the ribs, the latter were pressed against by the liver, and prevented the normal resilience of that part on percussion, which, as Sir W. Jenner remarked to me, was positive evidence of increased pressure in the region of the liver. At first, I could not detect the hydatid fremitus; but, when this became evident, of course all doubts as to the nature of the malady were dispelled from my own mind, as I regard this sign, when present, as quite pathognomonic of hydatids. The absence of jaundice, ascites, etc., and the age of the patient, were against the supposition of cancer of the liver. In previous cases, when I have found the fluid purulent-looking at the second aspiration, I have thought it better to make a large opening with a trocar and insert a drainage-tube. I now prefer to perform successive aspirations rather than convert the hydatid sac into a large abscess, unless serious constitutional symptoms imperatively demand a free opening.

Case II calls for no special remarks.

A STUDY OF TWO ILLUSTRATIVE CASES OF EPILEPSY.

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THE two cases of epilepsy which I venture to relate seem to me to illustrate some points in the nature of this process. I bring them forward chiefly because they present certain divergencies from the ordinary phenomena of epilepsy, and because these very divergencies throw some light, as I believe, on the nature of epilepsy in general.

I presume that all are agreed that, in the epileptic seizure, there is a violent perturbation in some part of the central nervous system, which perturbation often extends widely in that system. It is convenient to call this, with Hughlings Jackson, a discharge by the nervous tissue. The discharge is sudden and usually violent. It is also certain that the central nervous system consists of some parts which are related to the reception of impressions from without, and which may be named sensory parts, and others which are related to the muscular apparatus, and which may be named motor portions. If we cannot divide the whole nervous system into sensory or motor portions, we can at least say that some are motor and some non-motor. We must also believe that there are some parts more intimately related to intellectual processes than others; and this would form a third division, perhaps, overlapping the other two. Recent investigations seem to show that the convolutions on the surface of the brain are divisible in some such way. It seems to be proved that there is a part of the convolutions which may be definitely called motor, and many individual motor centres have been distinguished in this district. The sensory and other centres are not so easy to distinguish; but something has been done even in this direction. It seems probable also, from the results of recent research, that epilepsy usually begins in the discharge of nervous tissue in the convolutions, and the discharge may begin in any one of these presumed districts; and may remain there, though it generally extends beyond. The symptoms, at the commencement of the attack, are of very great importance; because, for one thing, they indicate where the discharge begins, and, besides, the patient can often tell us something about them if they have occurred before consciousness is lost. The symptoms will be different according to the kind of nervous tissue which discharges. If it be motor which first discharges, then spasms or convolutions will be the earliest manifestation. If a sensory part be first affected, then some peculiar feeling, referred to the periphery, such as a sensation of colour, will be the initial symptom. If, on the other hand, a centre related to the intellect be primarily attacked, then some idea or thought will first manifest itself. It is a fact worthy of the most careful attention, that the discharge seems always to begin in the same centre; the initial symptom is, in a given case, nearly always the same. Of course, there are cases where the loss of consciousness is so sudden that the patient is able to tell us nothing about it; but when we get a description from the patient, I believe it is almost invariably found that, in the individual case, the same movement, or feeling, or thought, always begins the attack. As the attack progresses, generally the whole brain is by and by set into a state of commotion; but we can often learn much by the

order in which the phenomena develop. The cases offer subject for reflection on these various points, as will be seen further on.

But before proceeding to the cases, I have something to say as to a matter on which the first case seems to me to have some bearing. In every case we ought to endeavour to find whether any cause is discoverable of this condition of the nervous system. Has anything occurred to set up this state, by virtue of which the nervous system is subject to sudden and severe discharges? Various causes have been adduced, to one of which only I shall refer. Convulsions are frequently referred to peripheral irritation. The convulsions of tetanus undoubtedly owe their origin to a peripheral cause; and the convulsions frequent in children are often ascribed to dentition or intestinal irritation. In the normal process of sensation, we must believe that the irritation of the sensory nerve sets up some temporary change in the central nervous system, this being the correlative of sensation, and we know that this change is often propagated to motor centres. The whole process of reflex action involves the reception by a sensory centre of an impression from without, which is propagated to a motor-centre, and thence to the muscles. We can readily believe that a sensory irritation, if continued, may induce some permanent change in the receiving centre. There is a case, quoted by Hughlings Jackson from Paget, in which a neuralgia was induced by an injury to a nerve. After an operation, in which the nerve was divided, the neuralgia persisted, evidently because an independent process had meanwhile been set up in the centre. It seems that peripheral irritation may set up processes in the central nervous system, by virtue of which it becomes unstable, subject to sudden and violent discharges. The parts primarily affected will, of course, be sensory parts; but here, just as in the case of reflex action, the discharge may pass from the sensory to the motor, and so a convulsion may result. It is also to be borne in mind that some centripetal nerves are not, in the strict sense, sensory; and irritation of such peripheral nerves may lead to convulsions without any sensory manifestation. In the first of my cases, we shall find, however, a sensory irritation apparently producing an unstable condition of the nervous system, in which discharge of a sensory part is followed by that of a motor.

CASE I.—S. G., a boy, aged 15, was admitted to the Western Infirmary on August 18th, 1875, with the statement that he was suffering from epileptic fits. On inquiry, it appeared that about a fortnight before admission, while at his usual occupation of holding a hammer against a rivet, the hammer slipped off the rivet, and the index finger was crushed between the shaft of the hammer and an iron bar. This caused great pain at the time, which soon passed off; but the nail was subsequently lost. He continued at the same occupation; but, in the course of a week or ten days, he experienced a feeling of numbness, or stinging, which began in the ball of the thumb, or base of the index finger, extending to the palm of the hand to the fingers, and afterwards up to the wrist. This was followed by twitches, first in the thumb, and afterwards in the fingers and forearm. For three or four days the convulsions went no further, occurring three or four times in each of these days. But on the fourth and fifth day after the first attack—the patient having all this time continued at work—the convulsion extended up the arm, and, when it had reached the chest, he became unconscious. While the spasm was still confined to the arm, and the patient was yet conscious, he was sensible of twitches on the right side of the face. He did not remember the legs moving during the attack; but he was told that, while unconscious, he kicked. When this first severe attack came on, he was in a ship which was building; and his first recollection, after the events mentioned above, was his lying in the dead-house (a place to which accidents are carried), with men standing around him. He soon recovered sufficiently to walk home. The same evening, he had a second severe attack exactly like that described. Since then, he had only one before admission, and it did not reach beyond the shoulder, and was unaccompanied by loss of consciousness. After each of the attacks, either small or great, the arm was left powerless and cold. The patient remained in the ward for about seven weeks, having, in the interval, an acute abdominal affection, but there were no fits during his residence.

About a month after he left the hospital, he returned to the dispensary. He had gone back to his employment, and the fits had recurred. He was advised to get some other kind of work, and bromide of potassium was prescribed. He has not been seen since. It may be added that the boy had been previously healthy, and had no attacks of this kind before those related.

The interesting feature in this case is the close relationship which seemed to exist between a peripheral irritation and the onset of the convulsive attack. An injury is inflicted on the sensitive index finger, involving the loss of the nail. The boy continues at an employment which involves a series of shocks and severe vibrations to the hand hold-

ing the hammer. In a week or ten days, an affection presents itself, which has for its immediate or physiological cause a peculiar condition of the central nervous system. The part of the nervous system involved is obviously related to the injured part of the body, and the first manifestations are sensory—a peculiar numbness or stinging in the hand and fingers. This is followed by motor phenomena; and here, again, the first symptoms are in the same locality—the twitches follow the order of the peculiar sensations. The analogy to reflex action is very striking. We have the peripheral irritation, the central sensory impression, and the discharge of motor impulse; but the sensory impression is, as it were, prolonged and stereotyped, and has been established as a confirmed condition before it leads to those very obtrusive motor phenomena. It is to be remarked here also, that the cessation of the sensory irritation seemed sufficient to put an end to the attacks. He had only two fits after he stopped work, and the second one was not severe. He had none while resident in the hospital, although treatment was intentionally delayed in order to observe the case. The recurrence of the irritation when he resumed work seems to have set up the condition again.

As to the part of the brain involved, we must suppose that the portion first discharged was a sensory part, and we have no very certain indications as to the locality of the sensory centres of the hand. But the parts discharging, when motion of the hand begins, are probably those in the neighbourhood of the fissure of Rolando, in the left side. The spread of the spasm, in this case, seems to confirm the view that the centres for the hand, arm, and for neighbouring parts in general, lie near each other.

CASE II.—W. B., aged 30, a saddler, consulted me at the Dispensary of the Western Infirmary, in June or July of last year, for epileptic attacks; and I was at once struck in his description with the fact that, while in the fit, he seemed on some occasions to perform actions closely resembling those of volition. He seemed to be greatly benefited by large doses of bromide of potassium, and, after attending for some time, was absent from the dispensary for a good many months. He returned in February last, and, in the meantime, a pulmonary affection had developed, for which he was sent into the hospital. This pulmonary disease forms itself a very interesting series of facts; but I propose to leave it entirely out of account, and devote attention to the nervous symptoms.

He has been subject to fits for about four years, and there is a doubtful history of one attack when he was twelve years of age. During these four years, the fits have been very irregular, both in frequency and severity, sometimes recurring several times daily, sometimes remaining away for weeks or even months, but they subsided when under treatment. The character of the individual attacks has also varied considerably, some of them being unaccompanied by loss of consciousness, but this being the exception. It is worthy of note, however, that in the most severe of the fits, he has not had any general convulsions, and has never fallen, although often attacked while in the erect posture. Observations made by patients and attendants in the ward during some recent attacks agreed that, though there was some movement of the hands, this was very slight, and did not amount to much more than clenching of the fists. We shall see afterwards that several of the phenomena are inconsistent with general convulsions.

In answer to questions as to the existence of any warning previous to the fit coming on, he gives what at first sight appears to be rather an unsatisfactory answer; but, as he is an intelligent man, the unsatisfactory nature of his communications must be taken as an index of his own feelings. He says that, with a few exceptions, to be presently noted, every fit he has ever had was preceded by giddiness, and a peculiar "thought", as he expressed it. He obviously attached great importance to this "thought", saying that, if it were known, the whole case would be explained. He cannot tell what the "thought" is, yet is confident that it is always the same. He always recognises it at once when it occurs, and he tries to fix it in his memory, but he invariably forgets it when the fit is over. On a few occasions, this giddiness and "thought" have been absent, but these have been times when the attack came on suddenly without any warning. When he has had warning, it has invariably been this same one. At the end of the fit, there is nearly always vomiting.

Sometimes, the fit only consists of the aura, followed by a peculiar feeling in the abdomen, which passes up to the head, and back to the abdomen, when vomiting results. This slight attack is not accompanied by unconsciousness, at least of any duration. At other times, there is the aura, then a period of unconsciousness, and then the vomiting.

It is to the phenomena, during this period of unconsciousness, that I wish to direct particular attention. If the attack come on while he is lying in bed, nothing special seems to happen; but if he were up and

going about, there are often occurrences which are worthy of notice. I shall here subjoin the descriptions of one or two of these attacks.

He was standing on a chair, putting a hat-box on a shelf, when one of the fits came on. His child noticed something queer, and ran for his wife, who found him standing on the chair with pallid face, and the box raised in his hands. He stood in this position for a minute or two, and then, recovering, placed the box on the shelf.

He was working in a shop in Renfield Street, at a time when a son was lying ill of fever. He thinks he imagined his son was dead; but, at any rate, without being the least conscious of what he did, he (according to the account of his shopmates) laid aside his tools, took off and hung up his leather apron, and, after muttering some unintelligible words to the foreman, left the shop. He himself remembers nothing of this; but woke to consciousness to find himself sitting on one of the benches in George Square. On comparing the hours, it seems that this was about ten minutes after he left the shop, and in the interval he walked through the busy streets from Renfield Street to George Square.

On another occasion, while he was sitting on a trunk, his wife noticed by the pallor of his face that he was having a fit. After the paleness had gone, he cried out: "There it is; take it, lift it", pointing to the floor. He at the same time made efforts to raise the lid of the trunk on which he was sitting. All this time he was quite unconscious, and has no idea of what he saw or supposed he saw.

Several times, he has walked considerable distances while perfectly unconscious, and has once or twice dropped his staff while in this state. Quite recently, he was outside the hospital on leave, and met a friend in Partick. One of the attacks came on, and the next thing he remembers is standing in a public-house and pointing to the bottles on the shelf. His friend, seeing him ill, had asked him to go to the public-house, and he had walked there, a distance of over a hundred yards, apparently without difficulty, but absolutely unconscious.

In the relation of this case, one is struck at once with the peculiar nature of the so-called aura or warning. In speaking of the former case, I regarded the feeling of numbness in the thumb and fingers as the first evidence of action in the nervous centres. This feeling, which I suppose would be called an aura, I regarded as, in fact, the beginning of the attack, and as affording evidence to us of the seat of origin of the process. And the aura in the present case I would regard as of similar import. The peculiar thought which the patient describes as preceding every attack indicates that the action always begins in the same part of the nervous centres. He says there is nothing specially terrible or unpleasant about the thought, nor is it a particularly agreeable one; but he has always found it there, and has always found it the same. The fact that a phenomenon of this kind is the initial one in the present case I regard as of considerable importance in relation to certain other peculiar features in the case. The centre primarily involved must be a very high one; it is one intimately related to mental or intellectual processes. This I regard as of consequence in view of an explanation, originated by Hughlings Jackson, of such phenomena as we find here. In an article in the *West Riding Asylum Reports* for 1875, there is a paper by that author, to which I would refer for a more detailed exposition of the theory. Suffice it to say that, in those cases in which patients are found to perform actions during a fit which have all the appearance of voluntary acts, these actions are really automatic. The nervous system is apparently built up in successive stages. The lowest centres, such as those in the cord, are simple; but, as we ascend, we come to more and more complex centres till we reach the highest, which are presumably most intimately related to the mind and will. The lower centres are, to a certain extent, independent, but also under the command or control of the higher. We may perform such actions as walking without any appreciable exercise of volition, or we may do them with the most direct volition. In the former case, the centres concerned in walking are acting, in a measure, automatically; in the latter, they are dominated by the higher centres. And now, if a high centre be put out of action, the lower may act automatically. If, as the result of an epileptic attack, a high centre be temporarily paralysed, then the lower centres may go on acting out of the control of the will. We know that epilepsy does produce a temporary exhaustion or paralysis of the centres which have discharged, and, if these be high centres, and if, along with them, low centres be not affected, then, after the discharge of these higher centres, there may be an unconscious and automatic action of the lower ones. And we may apply this to our case. The fact that the fit always begins with some indescribable thought indicates that a high centre is affected; and the fact that there are never serious convulsions shows that the fits are not in the habit of going deep, at least to motor centres. But, as a result of the fit, we have these peculiar automatic actions which I have so often referred to.

I would here advert to one other point involved in this view of Hugh-

lings Jackson. He insists that these actions occur after the discharge; are not actually the fit, although often described as if they replaced it. The case before us adds confirmation to this view. It is noted that paleness always accompanies the attack, and, in describing one of these peculiar occurrences, he distinctly states that, according to the evidence of his wife, it was after the paleness had gone that he pointed to the floor and cried out, "There it is; take it, lift it", and so on.

The particular kind of automatic action seems to be determined by accident. Hitherto he has never done anything peculiar when the fits occurred while he was in bed. He just lay still. But, if he were walking, he continued walking. In the last occurrence reported, the action seemed to be determined by the invitation of his friend to adjourn to a public-house. In this respect, the phenomena of the fit itself contrast with those following it, and I believe this to be a general rule. The attack comes on in an invariably constant form; but these automatic actions depend on the particular centre which happens to be most active at the time.

But this and similar cases have also some importance in a medico-legal point of view. Suppose that this man, instead of being a gentle and peaceable citizen, had been a rather ferocious man, with frequently thoughts of ill in his head; or suppose even that, at the particular time of the onset of one of these fits, his thoughts had been running on evil things. In either case, the subsequent automatic action would probably be determined by the ideas present, and, instead of an innocent and perhaps absurd performance, we might have a gross and palpable outrage. In such a case, I think there are few lawyers who would believe that the act was otherwise than criminal, especially if the previous conduct of the accused lent any weight to this view.

NOTES OF A VISIT TO THE MILITARY HOSPITALS OF THE CONTINENT.

By ALBERT A. GORE, M.D., Surgeon-Major, Dublin.

ON entering Austria, the traveller gets into an altogether different military atmosphere from that of Germany. The more practical dress of the German soldier gives place to uniforms more diversified in colour, and to an army less homogeneous in its rank and file. The men are of lighter build and rather taller than those composing the German infantry. The white uniforms, with turn-down grey or green collars, the light-blue trousers, and cow-skin knapsacks, have a pretty effect. Both men and officers wear a small stock, with a white rim, which shows above the collar. The men of the Hungarian regiments wear tight-fitting pantaloons and laced boots. Blue and brown loose-fitting patent jackets are also worn. The knapsack appears smaller than the one carried by the Prussians; but the folded greatcoat is more round the body, as in Germany, and the chako replaces the helmet. The general effect of the different uniforms in large masses is striking. The Hungarian soldiers are small, active fellows, with dark beards. The "campaign dress", or every-day uniform, of the Austrian medical officer is a pretty one, and very similar to that worn by officers of infantry: a small chako, with a gold beading round the bottom and a gold-lace device in front; a short light-blue patent jacket, with breast and side pockets, gilt buttons, a black velvet patch on the collar, on which was embroidered the badges of rank in gold—one, two, or three stars, according as the officer is an under-surgeon, over-surgeon, or battalion-surgeon. These stars are replaced by two pieces of gold-lace, indicating the rank of brigade-surgeon or surgeon-major. The collar of the Generalarzt is of gold-lace, with a broad Austrian knot of the same material on the cuffs. Gold-lace round belt, cavalry-pattern sword, and dark-coloured trousers, with a red or gold stripe, are worn by all officers. The hospital orderlies, or men of the Garnitals corps, wear dark-green patent jackets, with a patch of magenta on the collar. There are twelve companies of ambulance and hospital service; 1,180 on a peace footing, 3,876 on a war strength, and a "sanitary department", 1,291 in peace, 6,200 in war. The standing army numbers 278,470, capable of being raised to 831,709. The different ranks of medical officers are: Unterarzt, Oberarzt, Regimentsarzt, Brigadearzt. Each regiment of the line is composed of three field-battalions, two reserve, and one dépôt-battalion. When a soldier falls sick, the procedure is very similar to that in use in Prussia. An under-surgeon resides in barracks or the immediate neighbourhood.

Previously to the termination of the Franco-Italian war in 1854, and as late as the military events in Bohemia in 1866, the punishment in the Austrian army had been most severe, applications of the cane being not uncommon for very slight offences. Since then, a milder code has sprung up, with the happy effect of creating a far better feeling between officers and men. Arrest in barracks, or, in graver cases, the use of