Cases of Mental Disturbance after Injury to the Head, with particular reference to Loss of Memory.

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Case 1.—Some years ago a neighbour and friend presented himself with a generally dishevelled appearance at my office, and informed me, with some minuteness of detail, that he had been thrown from his horse owing to suddenly putting up his umbrella, at which his horse, shied; that he was stunned for a short time; that a man had caught his horse and assisted him to remount, and that not feeling very well he had come direct to me. His manner was so strange that I thought it best to see him home, and during the short walk thither he repeated to me over and over again, with wearisome reiteration, the detailed story of his fall. I left him in bed, with strict injunctions to stay there, and then found the man who had witnessed the accident, and discovered that the account given to me was correct, that the head had struck the ground, and that there was insensibility for two or three minutes. The next morning my patient remembered everything up to the time of the fall, even the fall itself and the cause of it, but all else was a blank. The assistance rendered him to remount his horse, his visit to me, our walk to his home, and our talk by the way, had never been recorded on the tables of his memory. No serious symptoms followed; headache, at first troublesome, disappeared in two or three days, and after some days rest and quiet my patient resumed his ordinary professional work, apparently none the worse for the accident. Such cases are not uncommon, and are indeed met with by most medical men in active practice. Their main interest lies in the loss of memory, on which I shall have something further to say.

In the next case, which was under the care of Dr. R. J. Garden, the loss of memory extended over a longer period, and the injury was more severe.

Case 2.—A man when drunk fell down a stone staircase, lighted on the back of his head, and was admitted into hospital on October 16. There was a contused wound of the scalp nearly 2 inches long and exposing the pericranium. No slit or depression in the bone could be found. Blood issued in moderate quantity from the nose and left ear. There was insensibility, with relaxed muscles, pallor, cold surfaces, regular somewhat dilated pupils, and shallow
quiet breathing, with occasional sighing. Pulse 60, small and uneven. On the next day the insensibility had somewhat diminished; there was restlessness, some irritability when disturbed, and incoherence of speech when roused. Pulse 100, fuller and more even; temperature 101. No fluid from ear, and nothing to point to fracture of base of skull. On the 19th the insensibility had disappeared, the patient was restless, irritable, confused, and incoherent, with a pulse of 108, and an evening temperature of 103. Under cold to head, purgatives, complete rest and quiet, the temperature subsided, and the patient became more rational. Three weeks after the accident the memory continued much impaired; there was a loss of recording power for recent events, the manner was peculiar, there was occasional pain in the head and dizziness on standing up. He was deaf in the left ear, where a raw line extended across the tympanum. The pulse and temperature were normal. The memory slowly returned, and the patient progressed to complete recovery.

Case 3.—T. T., aged 46, a storekeeper, and sharp man of business, when inspecting a new store in process of erection, stepped back and fell into an excavation for a cellar about 12 feet deep, striking his head violently. He was attended by Dr. MacQueen, to whom I am indebted for particulars of the early symptoms. The first were those of concussion, and as these passed off symptoms of cerebral irritation supervened, and subsequently there were hallucinations of sight and hearing, complete loss of the sense of taste, great restlessness, and many of the symptoms of subacute mania. He was admitted into the Licensed House for the Insane at Cook's River, on October 27, 1881, one month after the accident, and I saw him on the following day. His expression answered some questions rationally, but displayed a number of exalted delusions. He claimed as his own all the property around the asylum, had an exaggerated idea of his business capabilities, and spoke of having just ridden and won a horse-race. His memory was extremely defective. He had no knowledge whatever of his accident, and stoutly denied that he had been in any way ill or under medical care. No single event which had happened since the accident had made any impression on his memory. He had no idea even how he had travelled from home to Cook's River, and, further, he was considerably astray, as I ascertained from Dr. MacQueen and his brother, as to the events of his past life. With all this his manners were those of a gentleman, and on any reference to minor business topics he appeared shrewd and intelligent. The pulse ranged from 92 to 96, and the temperature was slightly more than normal. Three weeks after admission (seven weeks after the accident), when I again saw him, the pulse was less rapid, the temperature was normal, his manner was less fussy,
and his general appearance had improved. He had no remembrance of having seen me before, and I found that, though he recognized intimate friends who visited him, and spoke to them freely, he had no remembrance at the next visit (even though the interval was only a day or two) of having recently seen them, and a few minutes after the visits had no remembrance of the conversation which had passed. There was no remembrance of the accident, and he gave a perfectly apocryphal account of how he came to the asylum, and imagined that he had started from some new diggings and not from home. The sense of taste had returned, and the exalted delusions, though still present, found less ready and frequent expression. By the middle of December, more than two months after admission, and more than three months after the accident, the delusions had all but vanished, and the memory had much improved; the registering or recording power for recent events was nearly, if not quite, re-established, and his account of his past history was connected and correct. The period from the accident until about one month after admission was an absolute blank. He was discharged at the end of December, went to Tasmania, and came and saw me in the beginning of February, 1882, apparently quite well. In October, 1882, Dr. MacQueen wrote of him as recently married, and added, “his memory appears perfect, and I notice no alteration in him, though his brother and partner says he is less attentive to business, and that liquor affects him more than before the accident.”

In this case, and also in the two following, in addition to the amnesia, the marked exaltations and delusions of grandeur and wealth are interesting symptoms to the consideration of which I propose to advert in a subsequent part of this paper.

Case 4.—F.P.V., aged 49, a member of our profession, of temperate habits, and in active practice, was riding hurriedly to see a patient, in the middle of November, 1878, when his horse “propped” at a ditch, and he fell, pitching on to his head. He was picked up insensible, and remained more or less unconscious for a fortnight. There was bleeding from the ear, sub-conjunctival haemorrhage, and other symptoms of fractured base of skull. When he recovered consciousness he was restless, fidgety, and discontented; there was great loss of memory, and it was noticed that his mind was astray. He exhibited numerous extravagant delusions, and on one occasion was violent and made an attack on his wife. He was seen by Dr. Cox, by whose advice, after a short period of treatment, he was sent to Gladesville Hospital, on January 18, 1879. On admission (two months after the accident) the temperature was normal, and the chief physical symptoms were those of debility. He was thin and out of condition, and looked as if he had suffered from a long and exhausting illness. His demeanour was quiet and gentlemanly, and he answered ordinary
questions rationally and freely. He had not the slightest remembrance of his accident, or of any event which had happened in the two months which had since elapsed, and insisted that he came from India eight days ago, to see a sister who was ill in the hospital. He could not remember that he had ever lived at Adelong, where he was in practice for years, and described himself as the Commander of a Russian man-of-war, and the absolute owner of several large ships, and of considerable wealth. He knew the attendants who were constantly with him, and recognized the medical officers at their daily visits, but in an hour or so forgot that he had seen them. He occupied himself in reading newspapers and books, but did not appear to retain what he read, and he was interested in the ordinary amusement and life of the hospital. A month after his admission (three months after the accident) his wife visited him; he recognized, and seemed very pleased to see her, but in a short time had no remembrance of her visit. The recording power seemed absolutely gone. He seemed to have forgotten all about his home and the practice of his profession, and even his professional knowledge seemed lost. His delusions (all having reference to wealth and importance) were very numerous, and he was at times irritable, especially as to his detention, though, as a rule, most gentlemanly and well-conducted. By the end of April, upwards of five months after the accident, he was much stouter, the delusions had almost disappeared, his memory was improving, and he began to speak on professional subjects. In June his delusions had altogether disappeared, and the memory had so much improved that current events were duly registered, and his past life easily recalled. His accident, and all events subsequent to it, until within the last six weeks, had, however, left no impression on his mind. He returned to the practice of his profession, and died in the year 1881, from causes unconnected (so far as I could discover) with his accident.

Case 5.—J. K., aged 40. Like the last patient was a member of the medical profession, and as I eventually ascertained, after much correspondence and trouble, was of intemperate habits, and had led a wandering and unsettled life. After some years practice in Ireland, he served as medical officer in the Paraguayan army, then lived for some time on the western coast of South America, was wrecked in the Pacific, landed on one of the South Sea Islands, was rescued by a ship bound to Melbourne, and in Melbourne was engaged by the agent as surgeon to one of the San Francisco steamers, which he joined in Sydney. In March, 1870, whilst his ship was in Sydney, he fell, whilst in a state of intoxication, from a first floor balcony of a house in Macquarie-street, and was taken to the Sydney Infirmary. He was unconscious for some hours, and on recovery was found to have lost his memory and to be peculiar in manner. He was admitted
to Gladesville in the month of April, 1870, and was then in average general health, though somewhat thin and pale; the pulse was quiet and the temperature normal. He was exceedingly polite and gentlemanly in manner and correct in habits, and expressed himself as very contented with his surroundings. He had various extravagant delusions as to his importance and wealth, and spoke frequently of his knowledge of and association with eminent and wealthy people. He had not the slightest remembrance of the accident or of any events since, and beyond the fact that he was an Irishman and a doctor nothing as to his past life could be obtained from him. There was complete absence of the registration or conservation of new impressions. He did not even recognize the medical officers as they visited him from day to day, and though he read the newspapers, he had no idea what they contained.

Six months afterwards he was more intelligent, could remember the names of and recognize people he saw frequently, and gave some particulars of his past life when questioned, but recollection involved an effort, and, as he pathetically said, it was harder for him to remember these things than it was at one time to pass a college examination. A year after admission the extravagant delusions were somewhat less prominent, his memory for distant events was much better, but all his medical knowledge had absolutely vanished, and the impression made by current events was so slight that it seldom lasted beyond three or four days.

After this time some troublesome ulcerations appeared in various parts of the body, which were evidently syphilitic and yielded to iodide of potassium. There has been no further mental improvement, and no retrogression. He is now at Callan Park, and is always polite in manner and correct in habits. He is able to read and to play simple games, recognizes his immediate associates and frequent visitors, and his feelings and emotions are correct and apparently unimpaired, but the intellectual faculties and ideas, and professional knowledge, are almost effaced; the registration of new impressions is very faint, and the record when made seldom lasts more than a few days.

As a preliminary to discussing the pathology of the cases the notes of which I have read, it is necessary to point out, first, that though "there is memory in every nerve cell," to use Mandesby's words, in its highest forms it is an organization extending widely through the cortical layers of the cerebral hemispheres; and second, that in the three cases in which the loss of memory was both marked and prolonged, the parts of the memory most affected were those which are the first to fail in progressive amnesia due to old age, or accompanying the dementia of chronic brain disease. In these conditions forgetfulness, limited at first to recent events, extends to ideas, to intellectual acquisitions, the technique of science and professional knowledge. Then personal
recollections are obliterated; whilst the feelings and emotions which are the most profound, the most common, and the most tenacious of the phases of mental activity, and the organic acquisitions, the aptitude for mechanical work, the routine of daily life, and the habits which become more or less automatic or instinctive, require only a minimum of conscious memory, and have their seat in the cerebral ganglia—the medulla and spinal chord,—remain until the last. Pathological destruction indeed appears to attack first, and in many cases to be limited to the most highly developed and most unstable forms of memory, to those which have a personal character, are accompanied by a consciousness and localization in time, and constitute what may be called the "Psychical memory." According to Ribot, "progressive destruction of memory follows a logical order, it advances progressively from the unstable to the stable. It begins with the most recent recollections which, lightly impressed upon the nervous elements, rarely repeated, and consequently having no permanent associations, represent organization in its feeblest forms, and it ends with the sensorial instinctive memory which becomes a permanent and integral part of the organism, and represents organization in its most highly developed state.” From the researches of Griesinger, Foville, and others, it would appear that the pathological cause of this intellectual dissolution is "an atrophy which first invades the exterior cerebral layers, and then penetrates to the white substance, causing a fatty and atheromatous degeneration of cells, tubes, and capillaries of the nervous tissue,” so that these elements, a prey to atrophy and degeneration, are no longer capable of the conservation of new impressions. If the perception is entirely new it is either not registered at all in the nervous centres, or if registered the impression is faint and soon effaced, whilst new modifications and dynamical associations of cells are either impossible, or if possible, are not permanent. Bearing these facts in mind, and turning to cases of more or less temporary amnesia, we cannot pass over the most common form with which we are acquainted—that due to epilepsy. In attacks of petit mal and epileptic vertigo, although the outward signs of disturbance are in some cases extremely slight, the temporary loss of memory is often complete, and the mental automatism is hardly distinguishable from that seen in some cases of injury to the head. The pathological condition in these cases is, according to Hughlings Jackson, who in the 5th vol. of the West Riding Asylum Reports enters at length into this question, one of exhaustion of the cells forming the highest nervous centres, due to a nervous “discharge” during the paroxysms, but there is probably at the same time a disordered condition of the cerebral circulation in the convex, continuing for some time after the “discharge” has occurred, and interfering with the nutrition of the cerebral matter.
We may note in passing that the ultimate consequence of repeated epileptic seizures, especially in the form of vertigo, is the progressive and final destruction of psychical memory.

In all the cases which I have related the first symptoms were those of concussion—in the first case were limited to these—and it is necessary to inquire in what this somewhat mysterious condition consists. The theory put forward by Rokitanski and Nelaton, that the symptoms are due to minute extravasations of blood in the brain, may be passed over, because it has been repeatedly ascertained by post mortem examination that these small apoplexies are in some cases entirely absent, and all that can be inferred from their presence is that concussion and extravasation occasionally co-exist. Such was indeed probably the condition in the third case I have given, in which there was loss of taste, due to some injury or extravasation, caused by counter-stroke in the lower part of the temporo-sphenoidal lobe, where, according to Ferrier, the centres of taste and smell are localized in immediate relation to each other. The remaining theories of concussion are:

1st. That propounded by Fischer, of Breslau, who believes that the blow on the head produces reflex paralysis of the vessels of the brain and serious interference with the nutrition of the cerebral ganglia, and points out that an empty state of the arteries and a congested state of the veins is the only condition which is found on post mortem examination constantly accompanying the symptoms which clinical observation discovers to be those of concussion.

2nd. A modification of the old vibration theory of Pott, which supposes a molecular disturbance of the protoplasm of the tissues of the brain, which is accompanied by an impairment or abolition of their functions.

It appears to me highly probable that in extreme and prolonged cases, such as some of those I have narrated, both these theories are required to explain the symptoms. Fischer's theory is no doubt sufficient to explain the symptoms of concussion, and the very temporary loss of memory which as a rule accompanies it, but it is difficult to imagine the reflex paralysis of the vessels lasting long enough to interfere with the nutrition of the cerebral elements, so as to cause anything like a prolonged wasting and loss of function, which there is every reason to believe existed in the three last cases cited, unless there had been some molecular disturbance in the nerve cells themselves; though of course it is possible that sudden changes in the blood supply may alone be sufficient to initiate these.

There can I think be no doubt but that the prolonged loss of memory in the cases mentioned was due to minute or molecular changes in, and to subsequent want of nutrition of, the nervous
elements in the cortical layers of the cerebral hemispheres, and that as nutrition and health were re-established the memory returned. The whole history of the cases puts any question of coarse pathological changes out of consideration.

In the fifth and last case there was no return of function beyond a certain point, and in this there were the complications of syphilis and alcoholic excess. It is to the latter that I attribute the failure, as amnesia is one of the most frequent and marked symptoms of cerebral degeneration, due to chronic alcoholic poisoning. The mental exaltation, accompanied by delusions of grandeur, which was distinctly present in the 5th case, was extremely marked in the 3rd and 4th cases, and it is somewhat curious that I have not been able to find recorded any cases of brain affection due to injury in which similar symptoms have been observed, but they have been noticed in some cases of acute mania and of multiple sclerosis, and in rare cases of chronic cerebral softening or multiple thrombosis such as those recorded by Dr. Gasquet in the *Journal of Mental Science* for April, 1884. The existence of delusions in the cases I have detailed is no doubt due to the fact that the original injury or disease involved the highest co-ordinative plexuses of the cerebral convex, and that with the temporary abolition of functions of these centres the lower centres, no longer controlled, were thrown or sprang into activity. The patients lived from moment to moment without memory of what they had been. But why the delusions took this particular form of grandeur and extravagance, and whether this was due to pathological or physical changes, or was due to temperament, I can offer no explanation, though I would point out that in all these cases there was a stage of irritation or inflammation with increased blood supply, involving an augmentation of functional activity. These delusions undoubtedly possess a diagnostic importance, and in the 3rd case a most careful examination was necessary to make certain that the patient was not suffering from that clinical entity which we know as *general paralysis*, and under which, owing to hasty examination, some very different forms of disease are at times included.

In the cases above mentioned there were no delusions as to muscular strength or personal beauty, and these are present in the great majority of cases of general paralysis, and materially assist in the correct diagnosis of that affection. I have brought these cases under your notice because they appear to me interesting by reason of the pathological problems involved in them, and as showing, as far as two of them are concerned, how completely psychical memory may be re-established, even after long absence, when the loss has been due to uncomplicated injury to the head.

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