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RESEARCHES
ON THE
PATHOLOGY OF THE BRAIN.

PART III.
ON THE ORGANIC DISEASES OF THE BRAIN.

By JOHN ABERCROMBIE, M. D.
FELLOW OF THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

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1819

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RESEARCHES

PATHOLOGY OF THE BRAIN

ON THE ORGANIC DISEASES OF THE BRAIN

BY JOHN ABERNETHY, M.D.

OF THE HALL OF CHURCH OF ST. MARTIN

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PART III.

ON THE ORGANIC DISEASES OF THE BRAIN.

WHEN urgent symptoms seated in the brain do not yield in a short time to active treatment, and, on the other hand, do not shew any tendency to come speedily to a fatal termination, we begin to suspect some of those permanent changes in the organization of the brain, which we include under the general term, organic disease. The morbid condition, in such cases, may exist under various forms. There may be a tumour external to the brain, and in its formation quite distinct from it. There may be a tumour imbedded in the substance of the brain; and there may be induration of a portion of the brain itself. To these are to be added, thickening of the membranes, ossifica-

tions, hydatids, and several other morbid appearances, which will be more particularly referred to in the sequel. The symptoms also appear under various forms; and they vary considerably in their progress. In some of the cases they are at first very slight, and advance slowly and insidiously for a considerable time before they assume an alarming appearance. Other cases commence with more violent symptoms, which have generally either an inflammatory or an apoplectic character. In these, the first urgency is relieved by the evacuations and other remedies that are employed; but we soon find reason to believe that the disease is not thus to be removed. The patient perhaps is becoming pale and exhausted under the remedies, while the affection of the head is but little abated. New symptoms probably begin to appear, such as important affections of the senses, convulsive or paralytic symptoms; and thus we are led to perceive that the complaint which at first had the appearance of an acute attack, has passed into organic disease. Organic affections of the brain also frequently supervene upon injuries; and in these cases we observe the same variety in the symptoms. The injury may have been slight, and at the time perhaps excited no alarm; and it is only after a considerable interval that we find reason to suspect that from that period some diseased action has been going on in the brain, which at last comes to produce symptoms of a most unequivocal and alarming nature; or the injury may have been severe, the immediate urgency of the symptoms may have been subdued by the appropriate treatment, and organic disease may have been left, as the result of the morbid condition that had thus been excited. In all these cases the disease may go on for a considerable time, producing a variety of symptoms to be afterwards mentioned, and may at last be fatal suddenly by convulsion; more slowly by coma, of several days continuance; or still more gradually by the patient being, without either coma or convulsion, worn out by protracted suffering.

In tracing the symptoms of organic disease of the brain, it is necessary to distinguish betwixt those symptoms which are properly connected with the disease itself, and those which immediately precede the fatal termination; and it is necessary to keep in view the changes which take place in the morbid appearances, in connection with these fatal symptoms. It is chiefly when the patient dies of some other disease, without any change in the disease of the brain, that we find the morbid condition of that organ in what may be termed its original state. When the disease is itself fatal, it is generally by an attack of chronic inflammation; and, in connection with this,

important changes take place both in the seat of the original disease and in other parts of the brain. In the cases which will be referred to, these varieties will be observed. There are some in which, while the disease in the brain was going on, the patients died of other diseases, or were suddenly killed by accidents; and there are some in which they died suddenly in convulsion, without any symptoms that previously indicated perceptible change in the disease. There are some also in which they died gradually exhausted by protracted suffering, without any important change in the symptoms in the brain. But there are others in which, a short time before death, important changes took place in the symptoms, resembling an attack of chronic inflammation, and the patients were cut off by the usual course of this affection, terminating by coma of several days continuance. In these cases, besides the original organic disease, we find various morbid appearances connected with the fatal attack, such as effusion, suppuration, or a softened state of a part of the brain; (see case 11th;) and, in some of them, there is reason to believe that the organic disease itself, or part of it, has passed into suppuration. This probably occurred in cases 10th and 28th. In some cases, again, an attack of this kind may occur, and may be carried off by the ordinary treatment, the original disease then going on, until another attack of an inflammatory character is fatal. This probably occurred in cases 6th and 13th.

Another remarkable variety occurs, in which the organic disease seems to produce no urgent symptoms until the symptoms of chronic inflammation appear. This probably occurred in case 1, in which the symptoms commenced only six weeks before death, though the remarkable tumour that was met with on dissection must have existed for a much longer period.

In all the forms of the disease remarkable remissions of the symptoms occur, so that the patient and his friends may be deceived into a belief that no fixed disorder exists in the brain. Sometimes the pain occurs periodically, and with remarkable regularity, generally attacking in the early part of the night and going off towards morning. In other cases it is excited by various occasional causes; such as external heat, stimulating liquors, bodily exertions, agitation of mind, or even the excitement of cheerful conversation.

SECT. I.—SYMPTOMS OF ORGANIC DISEASE IN THE BRAIN.

When we attempt to arrange the organic diseases of the

brain, according to their symptoms, they seem naturally to be divided into eight classes.

I. The first class is distinguished by long continued and severe headach, without any other remarkable symptom. The pain varies very much in its seat and in its severity; and, in some cases, it occurs in paroxysms so as to resemble periodical headach; in other cases there is constant pain, but with paroxysms of aggravation. It is sometimes an acute lancinating pain, darting across the head from temple to temple; sometimes a more obtuse and fixed uneasiness, often referred to some particular part of the head, as the crown or the back of the head. In many cases it is accompanied by a violent throbbing, and this may be general, or it may be referred to a particular part, as the back of the head, or one temple. In the more violent paroxysms the pain is intense, obliging the patient to remain for a considerable time in one position, the slightest motion aggravating it to perfect torture; and sometimes there is transient delirium. In the earlier stages, and in some cases through a great part of the course of the disease, the symptoms suffer remarkable remissions, so as to deceive a superficial observer in regard to the real nature of the disease, and often to make it be considered as periodical headach, sick headach, or headach connected with dyspepsia. The latter supposition is countenanced by the stomach being frequently much disordered, and the more violent attacks being often accompanied by vomiting. The diagnosis is sometimes difficult, but, by attention, it may generally be made with tolerable precision. The long duration and violence of the pain will lead to a suspicion that the complaint is something more than common headach; and though the stomach is at times much disordered, it will be found that the complaints in the head do not keep pace with the state of the stomach, but that they are often most severe when no disorder that can account for them exists in the stomach. The patient generally cannot bear a warm room, the noise of company, or the exertion of cheerful conversation, without being distressed, and his headach increased. The same effect is produced by wine and all bodily exertions. He seeks quietness, coolness, and darkness. In these respects the disease differs from dyspeptic headach, which is usually relieved or dissipated by activity and cheerful company. Sometimes the paroxysms are accompanied by vomiting, and sometimes by violent throbbing in the head. If, along with these severe local symptoms, the face be pale and the pulse feeble, as is often the case, and the whole appearance indicating the reverse of plethora, organic

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disease may be suspected. In many cases, however, the diagnosis is extremely difficult; and it is only by the severity of the pain and its obstinate resistance of the most powerful remedies, that we come to suspect the nature of the disease. I have already alluded to a remarkable modification of this form of the disease, (exemplified in case 1st,) in which extensive organic disease seems to exist for a considerable time without producing any urgent symptoms until a short time before death. The symptoms which then appear seem to be rather connected with an attack of chronic inflammation than to be immediately dependent upon the organic disease.

The terminations of the cases of this first class will appear from the examples. They may be fatal by coma with or without convulsion; suddenly by convulsion; by gradual exhaustion without either convulsion or coma; or, while the affection is going on, the patient may die of another disease.

The description now given of this first form of the disease applies more or less to all the other forms; they differ from it chiefly in the addition of other symptoms, which make the nature of the complaint much more distinct, and it is in the character of these additional symptoms that they differ from one another.

II. In the second form, after some continuance of fixed uneasiness in the head, such as has now been described, the organs of sense come to be affected, and frequently the intellect. Every sense may be affected; most commonly the sight; frequently the hearing, sometimes the taste, and occasionally the smell. The loss of vision generally takes place gradually; the sight being first obscure, so that the patient sees dimly as through a mist, or with the outlines of objects ill defined; and after some time this terminates in blindness. One eye generally is first affected in this manner, and some time after it has become blind, the other begins to see indistinctly, and gradually becomes blind also. When both eyes are affected at once, the one is often affected in a greater degree than the other; the one pupil perhaps being observed dilated and immoveable, while the other appears much more healthy. One remarkable case will be mentioned, in which the blindness took place rather suddenly, and in which, some time after it had taken place, sight was restored under the action of an emetic, continued distinct for an hour, and then was lost for ever. In some cases double vision occurs, and it may either be permanent, or may occur only at intervals. In many cases of this class the intellect is impaired, and sometimes the speech is lost. In their terminations they

admit of the same varieties which have been mentioned in regard to the former class. The morbid appearances present no uniformity. In two of them there were tumours so situated as directly to compress the optic nerves; in another a large tumour pressed upon the corpora quadrigemina; in a third, the disease was seated at the lower part of the anterior lobe; and in case 12th, in which the right eye only was affected, it was in the substance of the left hemisphere, near the posterior part. In one by Drelincurtius, the disease was an enlargement of the pineal gland, and in another, in which there were both blindness and deafness, a large tumour was seated between the brain and cerebellum.

III. The third class corresponds with the second, in the pain and affections of the senses, with the addition of paroxysms of convulsion. These may occur with some degree of regularity like epilepsy; but in other cases they only occur at particular times, when, from causes which elude our observation, the disease seems to be aggravated and combined with an inflammatory tendency, (case 13th.) In case 19th the paroxysms had a resemblance to tetanus. In case 21st they rather resembled slight apoplectic attacks. In this case there was loss of sight, hearing, smell, and speech, and at last of the power of deglutition.

The cases of this class present the same varieties of morbid appearance as the former; no diversity appears in them that can account for the difference in symptoms betwixt the second and third classes; and when we compare both these with the first class, nothing appears to explain the remarkable difference in the symptoms, except in those cases in which the disease was so seated as immediately to compress the optic nerves. This seems invariably to produce blindness; but in the other cases it will appear that tumours similarly situated, and nearly of similar size, were, in some cases, accompanied by blindness and convulsion; in others, by blindness without convulsion; and in others, by pain without either of these affections. On what these remarkable differences depend, remains to be investigated by extensive and accurate observation. Case 18th is remarkable from the circumstance, that the convulsions ceased when the lungs became diseased, and did not return; the affection of the lungs being fatal.

IV. The fourth class is distinguished by convulsion, without any affections of the senses. In many of the cases there is little complaint of pain; and, in general, there is not that fixed

and constant pain which occurs in the other classes. The convulsion in some cases occurs under the usual form of epilepsy; in others, in more irregular attacks, occurring repeatedly for a short time, and then ceasing for a considerable interval. Sometimes violent paroxysms of headach precede or accompany the attack of convulsion. After some time the memory is generally impaired. These cases may be fatal suddenly in one of the fits, or by coma of some days continuance. The morbid appearances, as will be seen from the cases, are various. A tubercle in the cerebellum,—an hydatid in the right hemisphere of the brain,—induration of the pons Varolii, or of the substance of the brain,—tumours and bony spiculæ in various parts of the brain, are the most remarkable. An important variety of the disease occurs in which the convulsion is confined to one side of the body. Two cases of this kind are referred to; in one of which there was a tumour on the surface of the opposite hemisphere; and in the other, a portion of the opposite hemisphere was indurated. The former case was also remarkable from the long continuance of the disease, and from the weakness and diminution of size of the lower extremity of the affected side.

V. & VI. The fifth and sixth classes lead our attention to a new set of symptoms,—the paralytic. These may occur in the form of hemiplegia, paraplegia, or paralysis of all the parts below the neck. In some cases one limb only is affected. The disease is distinguished from the ordinary apoplectic paralysis by the affection coming on gradually,—one limb, perhaps, or part of a limb, being first weak, and the weakness extending by degrees over that limb and the corresponding one, and increasing very gradually till it amount to paralysis. In one of the cases the paralysis was preceded by violent pain in the limb. In other respects the cases of this class may resemble several of the other classes. There may be fixed uneasiness in the head, or there may be headach occurring in paroxysms. The speech is generally affected, and in many cases the memory. In one case there was blindness of one eye; in another, of both. In one there occurred convulsion, but not till an advanced period; in another, epilepsy for more than a year.

The dissections exhibit tumours or indurations variously situated; in the cases of hemiplegia, on the opposite side of the brain; in those of paraplegia, in the cerebellum or tuber annulare. In a remarkable case (33) of universal paralysis, with the mind entire to the last, the tumour was in the posterior part of the left hemisphere; in another, in which the disease was on the tuber annulare, there was first hemiplegia, which was recq-

vered from, then paraplegia, and at last universal paralysis. Extensive effusion occurred in several of them. This is probably to be considered as an effect of the disease.

VII. The seventh class presents to us a subject of much interest ; a train of symptoms which are very apt to be referred to the stomach, but which really depend upon disease in the brain. In many of the cases of organic disease the stomach is affected, but those to which I now allude are remarkable from the affections of the stomach being the most prominent symptom, and from there often being, through a considerable part of their progress, but little complaint of the head, or no complaint there so fixed and urgent as to direct our attention to the brain as the seat of the disease. There is generally, however, in these cases, some complaint of pain or weight in the head, sometimes occurring in paroxysms like periodical headach, or in paroxysms accompanied by vomiting, like what is called "sick headach." The pain is increased by exertions, external heat, passions of the mind, and stimulating liquors. There is generally variable appetite, bad sleep, oppression of stomach, acidity, and occasional vomiting. The vomiting sometimes occurs in the morning on first awaking, and sometimes it occurs at uncertain periods, and without any warning, occurring so rapidly that a patient will sometimes discharge the contents of his stomach upon a book which he is reading. There are various uneasy sensations, which are sometimes referred to one organ, sometimes to another ; and the disease has been often ascribed to derangement of the functions of the liver, or disordered action of some of the chylopoietic viscera. In this manner the case may go on for a considerable time before its real nature is fully ascertained. After some time, however, symptoms begin to appear which point out its dangerous character, such as fits of loss of recollection, affections of sight, convulsive paroxysms, and in one of these death may occur ; in some cases unexpectedly, in others preceded by a train of severe suffering. In cases of this class we must beware of being misled in regard to the nature of the complaint, by observing that the symptoms in the stomach are alleviated by attention to regimen, or by treatment directed to the stomach itself. If digestion be impeded, from whatever cause, the uneasy symptoms in that organ may be alleviated by great attention to articles of diet, but no inference can be drawn from this source in regard to the cause of the derangement. In the earlier periods of these cases the diagnosis is often difficult. There is generally more fixed and permanent uneasiness in the head than we should expect to

find in a dyspeptic case, and the uneasiness is increased by causes which would probably be beneficial to a dyspeptic head-ach, such as activity or cheerful company. The uneasiness in the head, also, is not regulated by the state of the stomach; but may be most severe, when from circumstances we have reason to believe the stomach to be in good order.

The morbid appearances connected with this class are various. The most remarkable in the annexed cases were in the cerebellum.

VIII. The eighth class is distinguished chiefly by those slight and transient apoplectic affections which I have alluded to when treating of apoplexy. I have formerly given several remarkable examples of these, connected with organic disease in the brain, and shall in this part of the subject add several more, illustrative of the different forms of the disease. In some cases it consists chiefly of an habitual giddiness, which makes the patient afraid to walk alone; in others there are sudden attacks of loss of all muscular power, which are soon recovered from and without loss of recollection. Sometimes there are attacks of perfect coma, which may occur at regular or at irregular intervals; the patient in some cases having such warning of their approach, that he lies down and immediately becomes comatose. There is usually more or less unsteadiness of the limbs, and generally, but not always, headach. In some cases there are affections of sight, and these may be either permanent or may occur in paroxysms. Sometimes urgent symptoms, such as giddiness and loss of recollection, are excited by bodily exertions, and go off on desisting from them. I refer to a former dissertation on apoplexy for the doctrine which I have proposed in regard to the pathology of these affections.

SECT. II.—OF THE NATURE OF THE ORGANIC DISEASES OF THE BRAIN.

The various forms of disease which have now been described are found to be connected with great variety of morbid appearances in the brain; but much observation is still wanting in regard to the minute characters of these appearances, and the connection betwixt particular forms of them, and particular varieties of the symptoms. The following are the most prominent appearances.

I.—Tumours formed by circumscribed depositions of coagul-

able lymph on the surface of the brain. These, I think, are generally formed under the dura mater, and they may be found in various steps of their progress, from recent depositions of a gelatinous appearance, to more firm and organized masses. In case 16th, of the first part of these essays,* I have described a remarkable tumour, formed by deposition of this kind, between the laminæ of the dura mater; and in different parts of that tumour, the different steps in its formation were distinctly traced, some parts of it being in the state of clear recent gelatinous matter, others firm, dense, and opaque. In a case quoted from Lancisius, in the second part, † a tumour, which was probably of this kind, occurred under the frontal bone; and there is another example of it in a case of epilepsy, from M. Poupart, referred to under that head in this paper. It is described as a thick, white substance, harder than jelly, under the dura mater. This affection probably proceeds from a state of chronic inflammation of a part of the dura mater, and is commonly accompanied by thickening of that membrane, at the part which covers the deposition.

II.—A very dense tumour growing from the dura mater, externally and internally of a uniform white appearance, like coagulated albumen. This does not appear in irregular masses like the former, but in distinct rounded tumours of various sizes, I have described one that grew from the falx, which was nearly five inches in circumference. They do not appear to be covered by any sac, but to be a production from the surface of the membrane. The large one which I have now referred to had, when analyzed, the properties of coagulated albumen. It was uniformly white and firm, and did not appear to be organized. The tumour growing from the tentorium in case 9th had nearly the same external appearance, but internally it was of a reddish colour, and appeared to be organized. The symptoms connected with tumours of this kind will be seen from the cases to be very different in different cases. Sometimes they arise from the outer surface of the dura mater; in this case they have frequently been known to produce absorption of the bone, and have been found rising externally under the integuments, so as to be mistaken for wens. I have given an example of this kind of tumour in case 25th. Many others are mentioned by the

* On Chronic Inflammation of the Brain and its Membranes, Edinburgh Medical and Surgical Journal, Vol: XIV. p. 291.

† Ibid. p. 577.

French writers.* In many of them the disease seems to have been originally induced by injuries; and in others an injury seemed to have accelerated the process of caries by which the tumour was making its way through the bone. When these tumours have been rashly meddled with by incision, death has generally been the consequence.

Small tumours which resemble those of this class are sometimes met with attached to the choroid plexus. I have seen one in each lateral ventricle the size of small hazel nuts in a man who died suddenly after having had repeated epileptic attacks at long intervals, and having been for some time affected with symptoms threatening apoplexy. Dr Baillie has delineated a similar appearance in one of his engravings.

III. A tumour on the surface of the brain, and distinct from the cerebral substance, inclosed in a sac, and with a slight attachment to the surrounding parts. Tumours of this class lie under the dura mater, and the sacs of them seem to be derived from the arachnoid membrane or the pia mater. The structure of them is variously described; some are compared to a scrofulous gland; others are said to be of a fatty appearance; others are reddish and more distinctly organized. They may be found in a state of suppuration, as in case 10th. They probably originate in enlargements of the small glandular-looking bodies which are found on the surface of the brain. They vary in size, and are sometimes met with as large as an egg.

IV. Particular parts of the brain in a state of enlargement, as the pineal gland in case 6th, the pituitary gland in case 10th.

V. Morbid changes in the substance of the brain or the cerebellum. I have formerly proposed an opinion that the diseases which come under this head are the result of chronic inflammation affecting a small part of the brain; and I have endeavoured to trace its progress from the state of simple inflammation to that of induration and final suppuration, in which it often terminates. In its early stage I believe it is a disease that may be cured, and that it may continue a considerable time in this state,—that after a certain time it passes into induration, and that probably there is in some cases formed around the indurated portion a sac of coagulable lymph. In this state it may

* See Mr John Bell's Principles of Surgery, Vol. II. p. 396, et seq.

continue for a long time producing urgent symptoms, and may at last be fatal by passing into suppuration, or without having suppurated. According to the stage of its progress, therefore, in which death takes place, we may find a portion of the brain in a state of recent inflammation, or indurated, and of a red or yellowish colour; or we may find a part of it hard and a part suppurated; or we may find the diseased part entirely suppurated. The simple induration we find chiefly when the patient dies of some other disease. When the disease itself is fatal, it is generally by a fresh inflammatory action, and thus the indurated part often passes into suppuration. We find, accordingly, in such cases, other marks of the inflammatory state, as deposition of coagulable lymph and serous effusion. The symptom attending this form of the disease, both in the brain and cerebellum, will be seen from the cases. The striking distinction in the appearances is betwixt simple induration of the cerebral matter and tumours imbedded in the substance of the brain. The term tumour seems to have been by many applied to both, so that there is a great want of precision on this part of the subject. That which is properly called a tumour in the substance of the brain, perhaps should have a sac by which it is separated from the cerebral matter; and it remains to be investigated whether such a tumour is a portion of the brain in a diseased state, and around which a sac of coagulable lymph has been formed by an inflammatory process, or whether a distinct tumour may be formed in the substance of the brain of the same kind as those which are formed on the surface.

VI. Ossifications. Under this head are to be included both osseous projections from the inner surface of the cranium, and internal ossifications, which are commonly formed in the dura mater, most frequently in the falx. An example of the former kind occurred in case 16th, connected with headach, convulsions, and blindness; and another, in a case quoted from Mr Gooch under the 8th class, in which there were frequent attacks of an apoplectic appearance combined with a convulsive affection resembling emprosthotonos. The internal ossifications usually appear in the form of thin laminæ of bone in the substance of the dura mater, most commonly in the falx, where they are sometimes found of considerable thickness. Of such ossifications there are many examples on record; some of them in cases in which the patients had enjoyed good health until cut off by some incidental disorder; others in which there had been urgent symptoms distinctly referable to the brain; and others in which there had been a long train of obscure com-

plaints, and no other morbid appearance but these ossifications were met with on dissection. The latter cases were chiefly affections of the stomach, with some headach; and some examples of it will be found under the 7th class of cases. It is probable that ossifications produce urgent symptoms in the brain, when they are in the form of sharp spiculæ, or have acute angles, which are so directed as to irritate the brain or the membranes. An example of this occurs in case 8th, in which a part of the dura mater, which was in contact with an angle of the ossification, was evidently inflamed. Another, connected with epilepsy, is quoted from La Motte under the 4th class of cases, in which there were bony spiculæ directed against the pia mater; and a third, from Van Swieten, under the same class, in which there was in the substance of the cerebellum an irregular piece of bone an inch long, and half an inch broad.

VII. *Hydatids*. This name has been applied to several appearances in the brain, some of which do not appear to be really hydatids. Of this kind are the vesicles which are frequently met with in the choroid plexus; they seem to be merely the loose cellular texture of that organ elevated into vesicles by watery effusion. In a case by Dr Baillie they could be injected from the veins. Real hydatids, however, seem to occur in the brain, as in a case quoted from Zeder, under the 8th class, in which there were numerous hydatids, one, particularly, the size of an egg, which contained three smaller hydatids within it. There are many examples of cysts in various parts of the brain, containing a watery fluid, but it is doubtful whether they are to be considered as hydatids. A cyst of this kind occurs in case 21st, and another in case 23d, in which the fluid was yellowish, and partly gelatinous. A woman mentioned by Bonetus, after a blow on the back of the head, had headach for a year with constant vertigo, and then died apoplectic. In the substance of the left hemisphere there was a cyst the size of an egg, which contained a clear fluid. (*Boneti Sepulchretum*, Vol. III. p. 319.) In a priest who had become stupid and died apoplectic, there were found certain round bladders full of a pituitous fluid above the corpus callosum. (*Ib.* Vol. I. p. 258.) In a girl, mentioned by the same writer, who died on the 12th day of a febrile disease which ended in coma, there was found, on separating the two hemispheres, a cyst which burst on a slight touch, and discharged limpid fluid to eight or nine ounces. (*Ib.* p. 172.) Bonetus mentions other cysts of a much larger size, one especially, attached to the nates and the infundibulum, which burst on taking it out, and discharged fluid to the amount of lb. ij. The

patient had complained of fixed pain in the vertex for four months. I was long inclined to doubt the accuracy of these accounts, and to suppose that, in such cases, the fluid had been really contained in the ventricles, until I received, through my friend Mr Frampton, the remarkable case by Mr Headington, (No. 29,) in which an hydatid or cyst was found in the left ventricle that contained $\frac{3}{4}$ xvj. of fluid.

I think it probable that some of these watery tumours are formed by effusion betwixt the laminæ of the membranes, or in cysts formed by doublings of the pia mater, connected with an inflammatory process. The possibility of such an occurrence appears from the case of a boy mentioned by Mr Paisley, who had fixed pain at a particular spot on the left side of the head, followed by coma, and died in 12 days. There was much effusion and other morbid appearances in the brain; and on the surface, exactly corresponding to the seat of the pain, there was a tumour the size of a large hazel nut, formed by a separation of the laminæ of the dura mater, and the deposition between them of a bloody serous fluid. (Edinburgh Medical Essays, Vol. III. p. 265.) In case 12th I have described a singular cyst found in the substance of the left hemisphere, full of a pure albuminous fluid.

Several tumours are mentioned which do not belong to any of these classes; the stony tumour, for example, in case 5th, and in the case quoted from Schenkus; the bloody tumour of Rochoux in case 28th, and some others. Of these little is known; the latter, perhaps, was of the nature of fungus hæmatodes. An affection of this kind has been observed in the brain, and fungous protrusions from the substance of the brain. These are familiar to us after the operation of trepan, but may also occur without any injury. A man mentioned by Dr Donald Monro, had a pulsating tumour above the left eye-brow, pressure on which produced headach and giddiness. He could give no account of the origin of it, but that he first observed it six months before, and it was then two fingers-breadth in diameter. It increased in size, and after seven months he died lethargic. On dissection the tumour was found to arise from the anterior part of the left hemisphere of the brain, and to have made its way through the frontal bone. It was the size of a China orange; its structure resembled the medullary substance of the brain, and it appeared to be covered by the dura mater. (Trans. of the Coll. of Physicians, I. 353.)

CASES AND ILLUSTRATIONS.

SECT. I.—FIRST CLASS.—Long continued headach, terminating at last by coma, or by gradual exhaustion, or the patient dying of some other disease.

1. A boy, aged 7, had been for more than a year affected with scrofulous sores, and during that time had been in a declining state, without any urgent symptom, till six weeks before his death, when he began to complain of pain of the abdomen, and a fixed and severe pain of the forehead. His pulse was natural, but his appetite was bad, his tongue foul, and his sleep disturbed. The pain of the belly was removed by purgatives, but that of the forehead continued very severe, so as sometimes to occasion screaming. The usual remedies having been employed, the pain was much alleviated, and for a fortnight he made little complaint. The headach then returned with much severity, and, without any other change in the symptoms, he gradually sunk into coma, and died in three days. *Dissection.*—Much fluid in the ventricles, and the substance of the brain in several places very soft and much broken down. A large firm white tumour adhered by its base to the middle of the falx at its lower part on the right side. It was nearly five inches in circumference at the broadest part, and about an inch and a half in thickness. Internally it was uniform, white, and firm, like coagulated albumen. It was imbedded in the substance of the right hemisphere where it had formed a depression for itself, but without any adhesion to the substance of brain. Its attachment to the falx was at the very lower part, and part of the tumour descended lower than the edge of the falx. There were two smaller tumours the size of hazel nuts, but of the same appearance, attached to the falx, one at its posterior and the other at its anterior extremity, both on the right side; and a fourth, also small, imbedded in the anterior lobe of the left hemisphere, and attached by a slender filament to the pia mater.

2. A boy, aged 14, affected with scrofulous disease of the knee, was seized with severe headach, which continued without any other symptom for two months. He was then seized with convulsion, followed by coma, and died on the 8th day. *Dissection.*—Serous effusion both in the ventricles and on the surface of the brain. Behind the posterior part of the medulla oblongata, there was a tumour the size of a walnut, of a rose colour and a fatty consistence, intersected with red lines. It was inclosed in a thin sac, and adhered

very slightly to the neighbouring parts. There was another of a smaller size in the substance of the left lobe of the cerebellum. The mesenteric glands were enlarged, and the small intestines in several places ulcerated. (Edinburgh Journal, II. 405.)

3. A man, aged 35. *Symptoms*.—Consumptive complaints and scrofulous sores; violent headach, which was sometimes so severe as to oblige him to remain for a considerable time in one posture, the slightest motion aggravating it to perfect torture. In this state he continued seven months, and then died of complete marasmus, without any change in the head symptoms. *Dissection*.— z^{iiij} . of fluid in the ventricles of the brain; a firm tumour the size of a pigeon's egg at the upper and middle part of the right hemisphere. It was inclosed in a reddish sac, and was internally of a yellowish colour. A larger tumour of the same appearance in the left lobe of the cerebellum. Extensive disease of the thorax and abdomen. (Ib. 406.)

4. A woman, aged 50. *Symptoms*.—Violent and constant pain under the sagittal suture for six months; then a lethargic state from which she recovered, the pain continuing as before for three weeks, when the lethargy returned, and was fatal. *Dissection*.—A tumour three inches broad, adhering to the membranes by the side of the third sinus; (the left lateral sinus?) effusion in the brain both externally and internally. (Willis, An. Brut. Pars II. Cap. 2.)

5. A noble lady. *Symptoms*.—Long continued headach, varying in degree, sometimes occurring in paroxysms which obliged her to scream and grasp her head with both her hands, the pain being such as if a sharp instrument were driven through her head. She died of dropsy. *Dissection*.—Under the dura mater, near the torcular, there was found a hard, rough, irregular mass of a stony consistence, (lapideam,) with many sharp processes and angles. It adhered firmly to the dura mater. (Borellus, App. Obs. xv.) A similar case by Schenkus, I. 113. A stony tumour like a mulberry in the brain of a man who had suffered from long continued and intense headach, which left him no interval of ease day or night.

6. An officer, aged 33. *Symptoms*.—Slight pain or confusion of head, with impaired appetite. After ten weeks nausea and pain in the balls of his eyes, especially when he turned them to either side. He was then wounded in the head; lost much blood; bone exfoliated, then healed. He was better for more than a year; was then attacked with headach, watchfulness, flushing, and ophthalmia. Recovered after three months, and was able for his duty, but never free from headach. It gradually increased; was sometimes referred to a spot on the occiput, and sometimes through the whole head. Was aggravated by motion, which produced a painful jarring in his head, and very much increased by going to stool. Pulse from 80 to 90. Pain at last became excruciating, with numbness of the left

hand. Became suddenly delirious, then comatose, and died, having been confined to bed but three days. Whole duration of the complaint three years. *Dissection.*— ζ iiij. of fluid in the ventricles. In the seat of the pineal gland, a little to the right side, there was a firm tumour, the size of a nutmeg; internally it was like cheese, but organized. Cerebellum very soft and broken down. (Trans. of Soc. II. 198.)

7. A young man, of 19 or 20, had violent pain in the forehead. It occurred in paroxysms, which generally continued four days, and were followed by intervals of partial relief of about the same duration. After two years he died suddenly in the night, in convulsion. *Dissection.*—In the substance of the cerebellum there was a tumour the size of a pigeon's egg, hard in the centre, and externally soft. All the other parts healthy. (Planque, Biblioth. III. 348.)

8. A man, aged 35, had been for a year affected with so violent a pain in his head that he sometimes lost his reason. *Dissection.*—Under the junction of the lambdoidal and sagittal sutures, there was at the broadest part of the falx a small triangular piece of bone with very sharp angles. Where these angles came in contact with the dura mater, it was livid, and discharged a little pus. There was effusion in the ventricles. (Saviard, Chirurg. Obs. vi.)

SECT. II.—SECOND CLASS.—Pain, Affections of the Senses, Speech, or Intellect.

9. R. N. a shoemaker, aged 47. *Symptoms.*—Headach, and a feeling of weight in the head, which began in May 1816, increased by stooping, and even by the posture in which he sat at his work; increased gradually, notwithstanding copious evacuations. In August, had giddiness and dimness of sight; pulse natural. In September, sight more affected, could only see objects in a very strong light. In October, several attacks of delirium in the night time; pain still constant and severe; sight continued to diminish, and by the end of December was lost. About the middle of January, a degree of stupor and forgetfulness, pupil insensible. Died comatose on 31st. *Dissection.*—About ζ iv. of fluid in the ventricles. A tumour, the size of a large egg, was attached to the tentorium, in such a manner that part of it lay above it, and part below it, the anterior part of the tentorium entering into its substance, to a considerable depth on its posterior part. On its upper part, the falx near its termination entered into it in the same manner. Internally, the tumour was firm, organized, and in colour resembled the structure of the kidney.

10. An officer who had seen much service. *Symptoms.*—Severe

headach, which subsided after some time, leaving a feeling of tightness across the forehead. After six or eight months, sudden diminution of sight of the right eye, and soon after blindness of it; then blindness of the left eye. Under the operation of an emetic the sight of the right eye was recovered for an hour; after this continued perfectly blind, and pupils insensible, but had no other complaint except disordered stomach, and a frequent disposition to vomit. Pulse natural. Died comatose, two years after the commencement of the disease. *Dissection.*— $\bar{z}$ iv. of fluid in the ventricles. A tumour the size of a hen's egg, containing a thick purulent fluid, was situated under the anterior part of the brain, and interposed between the optic nerves, which were much separated from each other by it. Below, it was attached to the pituitary gland, which was very soft, and enlarged to five or six times its natural size; posteriorly the tumour extended into the third ventricle. (Med. Trans. V. 223.)

11. A man, aged 30. *Symptoms.*—Excruciating headach, which commenced after hard work in a hay field. The pain was chiefly referred to the forehead, from which it extended over the left ear, but sometimes affected the right side of the head also, and occasionally the neck; most severe in the night; violent throbbing in the head. After six weeks his sight was much impaired, and soon after lost; face a little twisted to the left side; pulse little affected. Two months from the beginning of the complaint, he had an apoplectic attack, and died in two days. *Dissection.*—A tumour the size of a large walnut projected from the lower part of the anterior lobe of the left hemisphere of the brain. Internally it resembled an absorbent gland. The greater part of the medullary substance of the left hemisphere was reduced to a soft pulpy state, and was of a light brown colour. (Med. Trans. V. 241.)

12. A. M. a shoemaker, aged 50, for sometime affected with cough and bloody expectoration. In June 1818 was affected with headach and some confusion of thought, which appeared chiefly in a tendency to misapply words. The pain increased, attacked him in violent paroxysms, and was referred to the forehead. The sight of the right eye was impaired, and soon after lost; his speech became indistinct, and after sometime inarticulate. Six weeks after the beginning of the complaint, all the symptoms were increased. Violent paroxysms of pain were excited by the least motion, even by change of posture in bed. He seldom attempted to speak, but often pressed his hand on his forehead, and he seemed to have uneasiness in his right arm. He had some squinting; general weakness and paleness; intellect impaired. Died comatose in August. Pulse had been usually natural, sometimes slow. *Dissection.*—In the substance of the left hemisphere of the brain, towards the posterior part, there was a soft and vascular sac containing about $\bar{z}$ ij. of a thick colourless albuminous fluid, coagulable by heat, and exactly resembling the albumen of an egg. The cerebral substance around the sac was softened; the brain in other

respects was healthy. The ventricles contained a small quantity of serous fluid, and had no communication with the sac.

Many other examples of this class are on record, which it is not necessary to describe particularly, the symptoms being in all very similar, viz. fixed pain in the head, gradual loss of sight, generally first in the one eye and then in the other after some interval, the intellect being frequently impaired in the advanced stages, and the disease fatal, either suddenly by convulsion, by coma of a few days continuance, or by gradual exhaustion. In a case by Platerus, fatal by gradual wasting, there was a tumour larger than an egg, compressing the origin of the optic nerves. In one by Drelincurtius, there was a steatomatous tumour, the size of a fist, between the brain and the cerebellum. In this case there were both blindness and deafness, and it was fatal suddenly by an apoplectic attack. In another, by the same writer, the pineal gland was enlarged to the size of an egg, and was of an earthy or stony structure.

SECT. III.—THIRD CLASS.—Pain, Affections of the Senses, and Convulsion.

13. A girl, aged 11, long liable to headach, and affected with weakness of sight, and a peculiar tenderness of the integuments of the head, in autumn 1814 received an injury of the forehead from a fall, and from that time suffered much from headach, with frequent epistaxis. About the end of December, headach increased in violence, with fever, intolerance of light and sound, squinting, and convulsive paroxysms, which for some time occurred every half hour. In March 1815, a great amendment took place, and for nearly a year she continued better in regard to the head symptoms, but affected with scrofulous sores on the neck, and on the leg. In May 1816, headach increased, with impatience of light and sound, squinting, gradual failure of sight, and at last blindness in July. She died in October, her intellectual faculties having continued unimpaired. Great intolerance of sound continued to the last, and remarkable acuteness of hearing. *Dissection.*—A tumour the size of a walnut rested on the sella tursica, and compressed the junction of the optic nerves. It was composed of a medullary substance of a yellowish colour, and was covered by a thin and delicate membrane. Considerable effusion in the ventricles.

14. A lady, aged 40, of a scrofulous habit. *Symptoms.*—Gradual failure of memory, of sight, and hearing; inarticulate speech; epileptic paroxysms, at first once in the fortnight, afterwards more frequent; her gait feeble and tottering; died in six months. A year before her death, she had been much stunned by a fall down a stair. *Dissection.*—A tumour the size of a small orange lay on the pars petrosa of the left temporal bone, inclining to the opposite

side, and producing a great depression in the substance of the brain. The 7th pair of nerves, and the branches of the 5th pair, were compressed and stretched by the tumour. Internally it consisted of a soft uniform substance, resembling the cineritious matter of the brain. •

15. A young man, aged 15. *Symptoms*.—Deep-seated pain in the head. After six months inarticulate speech; then three attacks of convulsion, each of ten or fifteen minutes duration; the last left paralysis of the right side, which disappeared next day. Died comatose in another month, having had repeated convulsive attacks, intense head-ach, impatience of light, afterwards dilatation of the pupils, deafness, paralysis of the eyelids, very difficult articulation, and some delirium. Pulse slow. *Dissection*.—Membranes of the brain very vascular; 3iv. of fluid in the ventricles. On the left side of the pons Varolii there was a hard tumour the size of a bean; cerebral substance round it was soft, approaching to suppuration. (Coindet sur l'Hydrenceph. p. 98.)

16. A man, (age not mentioned.) *Symptoms*.—Severe headach, followed by amaurosis and epileptic paroxysms, which occurred almost daily; died in an apoplectic attack. *Dissection*.—On the inner surface of the left parietal bone there was an osseous spongy tumour, three inches broad, and more than an inch in thickness. (Wepfer, p. 508.)

17. A man, aged 35. *Symptoms*.—Severe pain, and sense of weight in the head for two years; copious epistaxis; lost the sense of smell; then frequent epileptic paroxysms, which continued for two years; died suddenly. *Dissection*.—On the anterior part of the right hemisphere, the substance of the brain was hard and callous, and adhered intimately to the dura mater. On the left side there was some extravasated blood. (Morgagni, Ep. ix. § 25.)

18. A man, aged 24. *Symptoms*.—Severe headach, with fever. Fever ceased, headach remained, with watchfulness and imbecility of the head, (vertigo?) Blindness of the left eye, and after a month of the right also. Convulsive paroxysms, which continued to recur for half a year; they then ceased, and he died of cough, with purulent expectoration, hectic fever, and wasting. *Dissection*.—Extensive disease of the lungs; much effusion in the brain. In the substance of the left hemisphere, there was a tumour larger than an egg, covered by a firm sac; internally it was white, firm, and uniform, re-

• For Cases 13th and 14th I am indebted to Dr Hay, under whose care they were.

resembling coagulated albumen, but harder; it weighed 14 drachms. (Fel. Platerus, L. I. 108.)

19. A man, aged 26. *Symptoms*.—Severe headach, most distressing when lying on left side, and giddiness; occurring in paroxysms. After several months, pain increased, with defective vision; dilated pupil; pain increased by motion; paroxysms of giddiness, with loss of speech and blindness during the paroxysm, and stiffness of the limbs; then double vision; violent pain in the neck, with convulsive paroxysms, affecting the muscles of the neck, and drawing the head violently backwards. Two months after this, he had numbness and spasmodic motions of the superior extremities. Died suddenly in a fit resembling epilepsy seven or eight months after the commencement of the disease. *Dissection*.—A hard tumour, two inches long, and an inch and a half broad, was firmly attached to the tentorium, and imbedded in the posterior lobe of the left hemisphere of the brain. It contained $\frac{3}{4}$ of greenish pus. Substance of the brain near it was very soft, and broken down. Where the tumour pressed against the occipital bone, the dura mater was obliterated, and the bone rough. $\frac{3}{4}$ of fluid in the ventricles. (Clarke, Ed. Journ. VI. p. 275.)

20. A woman, aged 23. *Symptoms*.—After suppressed menstruation, violent headach, imperfect vision, dilated pupils, and after some time blindness. Repeated convulsive attacks, after one of which, she lost her speech for two days. Died comatose about four months after the commencement of the complaint. Intellect entire, till a few days before death. *Dissection*.—On the surface of the right hemisphere there were three hardened spots, each an inch in diameter. They constituted a part of as many tubercles which extended into the medullary substance of the brain. A similar tubercle was imbedded in the substance of the hemisphere, and one smaller on the surface of the left hemisphere; slight effusion in the ventricles. (Powel, Med. Trans. V. 219.)

21. A woman, aged 19. *Symptoms*.—Headach, vertigo, suffusion of the eyes; paroxysms in which she fell down insensible without convulsion. They attacked her once in three weeks, and at each time there were two paroxysms at the distance of twelve hours. After eight or nine months these attacks increased in severity. She lost her hearing, and then her sight, first of the right eye, and after fourteen days of the left also; then lost her smell. Speech and deglutition were much impaired. Soon after this died apoplectic. *Dissection*.—Imbedded in the substance of the right hemisphere, there was a hydatid three inches long and two broad, and very vascular; brain in other respects healthy. (Med. Ch. Trans. II. 260.)

SECT. IV.—FOURTH CLASS.—Convulsions without affections of the Senses. Intellect sometimes impaired.

22. A woman, aged 43. *Symptoms*.—Headach; spasmodic affections of the limbs; after seven months was confined to bed; violent paroxysms of headach; loss of memory. Convulsive attacks more frequent; at last several times a day. Died suddenly in one of them, six or seven weeks after she was confined to bed. *Dissection*.— $\frac{3}{4}$ iv. of fluid in the ventricles. A tubercle the size of a nut in the left lobe of the cerebellum; surrounding substance much softened. (Rochoux sur l'Apop. p. 151.)

23. A man, aged 60. Epileptic for six years, with loss of memory. Died suddenly. *Dissection*.—A hydatid the size of a pigeon's egg in the substance of the posterior part of the right hemisphere. It contained a yellowish fluid, which was partly gelatinous. Substance of the brain under it was hardened. (Lancisius de Sub. Mort. Cap. xi.)

24. A boy, aged 16 months, formerly healthy, was seized with an attack of convulsion. It affected chiefly his right side, which was very strongly convulsed. He had a second attack on the evening of the same day, after which he had fever, blindness, and loss of the power of deglutition. In this state he continued, supported by glysters, for ten days, when he had another fit; and after this he gradually recovered the power of vision and deglutition. From this time there was a degree of paralysis of the right side, but in other respects, he enjoyed good health for four years. He then became affected with epileptic paroxysms, which at first occurred once in two months, but gradually increased in frequency. After a longer interval than usual, a few weeks before his death, the fits returned after a fright, recurred with great frequency, and were fatal. He was then twelve years of age; his right side had continued weak; and at the time of his death, the right lower extremity was three inches shorter than the other. His intellectual faculties had been weak, so that he never could be taught to read. *Dissection*.—On the surface of the brain, under the left parietal bone, there was a tumour the size of an egg. It was situated between the pia mater and the arachnoid membrane. Internally, it was of a white, and somewhat gelatinous appearance, but very firm, and when cut into, some serous fluid was discharged from it; no effusion.*

25. A woman, aged 50. Epileptic for 30 years. Was seized with a cough, which excited acute pain under the upper part of the occipital bone. In one of the epileptic fits she received a violent blow on this spot. From this time she was never free from suffering; and after six weeks, a tumour appeared on the spot, which pul-

* For this case I am indebted to Dr Beilby.

sated. It could be pressed back into the cavity of the cranium, and this produced coma. After several months, she had palsy of the right arm, and both lower extremities, and soon after died. *Dissection.*—The tumour was generated in the substance of the dura mater. It projected inwards into a hollow on the left hemisphere, and outwards through an opening in the bone, which was two inches in its long diameter, by one and a half. The dura mater near it was remarkably vascular. (Marigues, *Mem. de Chir.* p. 26.)

It is unnecessary to detail particularly the cases of this class. They present the usual symptoms of the epileptic paroxysm, occurring at various intervals, and in various degrees of severity, sometimes accompanied by violent attacks of headach, and sometimes with little uneasiness in the head. They are sometimes fatal suddenly in one of the fits, and sometimes by coma. A variety of morbid appearances have been observed in such cases. Portal found a remarkable induration of the pons Varolii. In a case by Sandifort, there were three tubercles on the dura mater, near the sagittal suture, on the right side, and in the anterior part of the right hemisphere, a sebaceous tumour, the size of a walnut. In a case by Lieutaud, there were seven sarcomatous tumours near the longitudinal sinus; and in another a glandular tumour, the size of a bean, in the substance of the right corpus striatum. In a young man, mentioned by M. Poupart, in whom the fits occurred once a week, there was "a thick, white substance, harder than jelly, under the dura mater." In a man mentioned by Lamotte, who died of an abscess of the lungs, after being many years epileptic, several sharp, bony spiculæ were found between the dura mater and pia mater, their points being directed against the pia mater. Several cases of the same kind are referred to by Van Swieten, in one of which there was an irregular piece of bone in the substance of the cerebellum, an inch long and half an inch broad. In a case by Dr Anderson, in which epilepsy came on after a severe injury on the back of the head, the posterior part of the brain, in both hemispheres, was found inflamed, and much hardened, with thickening of the membranes. A modification of epilepsy is met with, in which the convulsion is confined to one side of the body. In a case of this kind, by Dr Anderson, a portion of the brain, on the opposite side, was much indurated, with adhesion and thickening of the membranes. The same peculiarity in the symptoms occurred in Dr Beilby's case, (case 24.) The following case, by Lieutaud, differs from these epileptic affections.

26. A man, aged 30. Had violent headach for three months, then violent convulsions, which were soon fatal. *Dissection*—The longitudinal sinus, externally and internally, was covered with innumerable small glandular grains. Similar bodies were found on the choroid plexus. In the fourth ventricle there appeared a tumour the size of an egg, formed by a congeries of innumerable hard glandular bodies, verging to suppuration. Nearly the whole of the cerebellum had the same appearance.

SECT. V.—FIFTH CLASS.—Symptoms in the Head, with Paralysis.—Hemiplegia.

27. A man, aged 36. *Symptoms*.—Occasional attacks of severe pain in the head, shooting from behind forwards. After a few months, he found, on awaking one morning, double vision. After a few days more, his right hand was weak, and the weakness, with numbness, extended gradually over the whole right side, with distortion of the mouth, and inarticulate speech. The left eye was drawn towards the nose. Pulse natural. About two months from the commencement of the paralysis, he became convulsed. The convulsion returned at short intervals, and he died in 24 hours. *Dissection*.—On the left side of the tuber annulare there was a tumour the size of a hazel nut. It was lying on, and sunk into the tuber. It extended to the left corpus pyramidale, compressing it and the abductor nerve, and was closely attached to the basilar artery. A small coagulum was formed within the artery, at this place, and its coats were very soft. The tumour was in a state of imperfect suppuration. Yelloly. (Med. Ch. Tr. I. 181.)

28. A man, aged 63. *Symptoms*.—Six months after a severe blow on the head, had pain and sense of weight in the head, at first coming in paroxysms, then more permanent, with slight weakness of the right side, and transient loss of recollection. Symptoms increased very gradually to paralysis of right side, loss of speech, twisting of the mouth to the left side, and great failure of intellect. Died comatose more than two years from the commencement of the disease. Coma had continued a week. *Dissection*.—On the outer and anterior part of the left hemisphere there was a tumour the size of an egg, and full of blood, “which seemed to be contained in it in some places, as it is in the spleen;” in others it was in small clots, a line or more in diameter, very firm, of a cellular texture, and greyish colour, resembling tubercles. The tumour in general was of a red-brown colour, and very firm. It adhered slightly to the dura mater and the arachnoid, which was red and thickened where it covered the tumour. Below, it was imbedded in the substance of the hemisphere, and the cerebral matter was softened. 3i. of fluid in the ventricles. (Rochoux, p. 149.)

29. A boy, aged 11. *Symptoms*.—Sudden attack of dimness of sight, amounting to blindness. It went off in a few minutes, but from that time his sight was gradually impaired, and after a year nearly lost. He then had an affection resembling chorea; and after a short time suffered an attack in which he lay speechless for three days. This was followed by hemiplegia of the right side. He complained much of his head, which appeared to his friends to enlarge; and he sometimes lost his speech for two or three days. His intellect was not affected, but at times was extremely acute. He died after

coma of five weeks continuance, about a year after the attack of hemiplegia, and two years from the commencement of the disease. *Dissection.*—On the surface of the left hemisphere the membranes adhered firmly to the surface of the brain for some extent on the middle lobe. On raising them at this place fluid escaped in great quantity; and, on farther examination, it was found to have been discharged from the cyst of an immense hydatid, which was seated in the left lateral ventricle, and had gradually advanced to the circumference of the brain. It contained about ℥xvj. of limpid fluid, and, besides this, there were several ounces in the proper cavity of the ventricle. *

The cases of this class that are on record present little variety in the symptoms. They are generally headach, with or without affections of sight; and after some time weakness of the muscles of one side, which gradually increases till it amounts to paralysis. In a case of this kind by Bonetus there was a tumour three inches long attached to the side of the third sinus. Another, exactly similar, is related by Blancardus. A gentleman, mentioned by Mr Gooch, along with a variety of nervous symptoms, had an excruciating pain of one arm, beginning at the finger ends, and gradually ascending as high as the insertion of the deltoid. The arm at last became paralytic, and soon after he died in convulsion. On dissection two small encysted tumours were found on the surface of the brain, on the opposite side to the affected limb. The other parts were healthy.

SECT. VI.—SIXTH CLASS.—Symptoms in the Head, with Paraplegia.

30. A boy, aged 7, (for whose case I am indebted to Dr Gregory,) in the beginning of the year 1811, received a violent injury of his forehead and nose by a fall. From that time he had headach. After two or three months he became near-sighted. Soon after his sight became indistinct, and after four or five months more this was followed by blindness. About this time he began to be epileptic, and affected with weakness of the lower extremities, which gradually increased to perfect paraplegia. He died in April 1812, after coma of three days, his intellect having continued entire till that time. *Dissection.*—A firm, white, flat tumour, like a large bean, lay over the junction of the optic nerves. The ventricles contained ℥xii. of clear fluid. The left lobe of the cerebellum was much indurated, like scirrhus; the right lobe was reduced to a mass resembling scrofulous pus.

* For this remarkable case I am indebted to Mr Headington of London.

31. A man, aged 48. *Symptoms*.—Acute headach for a year, followed by paralysis of both lower extremities, the superior extremities being sound. Died suddenly about five months after the commencement of the paraplegia. *Dissection*.—The left lobe of the cerebellum was almost entirely scirrhus, of a pale flesh colour, and seemed to be composed of numerous small corpuscles closely compacted, without any interstice or any appearance of vessels. A small part only on the upper surface was in a healthy state. The corpus callosum, fornix, and some of the other central parts of the brain, were much softened and broken down. (Morgagni, lxii. 15.)

32. A man, aged 35. *Symptoms*.—Pain in the head, which after some time fixed chiefly in the occiput, extending down the neck. Occasional vertigo and sickness. After five months, hemiplegia of the left side; imperfect vision. Headach continued, though less severe. Hemiplegia diminished gradually; and after five or six months more he became liable to fits of stupor, which were preceded by violent pain and vertigo, and occurred sometimes twenty times in a day. Blindness of right eye, failure of memory, then paraplegia, and, a fortnight before his death, paralysis of the upper extremities also. The duration of the complaint was a year and eight months. *Dissection*.—On the surface of the pons Varolii there were two triangular fleshy tumours nearly united by their apices. The base of the one extended into the right crus cerebri, that of the other into the medulla oblongata. The disease penetrated the substance of the pons. There was much effusion under the arachnoid membrane. (Ed. Journ. XI. 470.)

33. A man, aged 63. General and complete paralysis of the whole body, which came on gradually and insensibly, without any evident cause. Speech indistinct. Mind entire to the last. Died of gangrene of the nates. *Dissection*.—A tumour the size of a hen's egg was lodged in the medullary substance of the left hemisphere, betwixt the fissure of Silvius and the part which rests upon the tentorium. It was contained in a cyst, and was internally of a brownish colour and lardy consistence. (Bull. Facult. Med. May 1816.)

SECT. VII.—SEVENTH CLASS.—Prominent Symptoms in the Digestive Organs.

34. An officer, aged 27. *Symptoms*.—Constant nausea and frequent vomiting. A slight thickening of the pericranium. Headach and general indisposition. After a considerable time numbness of the right side. Five weeks after this died suddenly in the night. *Dissection*.—The dura mater covering the cerebellum at its posterior and inferior part was thickened and cartilaginous. This diseased state had communicated itself to that part of the cerebellum lying in

contact with it, and had extended considerably into its substance. Other parts of the cerebellum softened. Membranes of the spinal cord hard and thickened. Thoracic and abdominal viscera were sound. (Med. Repos. Vol. VIII. p. 398.)

35. A medical man, in the meridian of life, had been for a year liable to attacks of dyspepsia with headach. In October 1815, he had severe headach with fever, relieved by blood-letting. After this he had various uneasy feelings which he referred to his liver; complete want of digestion, headach, and frequent vomiting, which occurred chiefly in the morning, and general emaciation. In July 1816 he visited London and Cheltenham, at both which places the first practitioners ascribed his complaints to "irregularity of the functions of the liver." In August headach increased, nothing agreed with his stomach, almost every thing was vomited. After some time the pain was much relieved, and the prominent symptoms were the morning sickness and vomiting, with increasing emaciation. Bowels torpid, frequent eructations, and hiccup. In the end of September had twice a slight convulsion. Headach periodical. Mind entire. Conversation induced headach, and sometimes convulsion. 9th October, died suddenly in convulsion. *Dissection.*— $\frac{3}{4}$ iv. of fluid in the ventricles of the brain. On the inferior part of the left lobe of the cerebellum, there was an encysted tumour the size of a French walnut, besides a vesicular portion connected with it containing some yellow serum. The tumour was invested both by the pia mater and dura mater, and was attached by a small pedicle to the substance of the cerebellum, where it had formed a depression in which it was imbedded. On the corresponding part of the opposite lobe there was a small florid tumour the size of a large pea. The abdominal viscera were sound. (Med. Repos. Vol. VII. p. 92.)

Many other cases are on record in which the only morbid appearances were in the head, though some of the most prominent symptoms had been in the stomach. Some of these resembled what has been called the sick-headach; others were chiefly distinguished by remarkable disturbance of the digestive functions. There is generally more or less headach, with various uneasy feelings in the head; but these symptoms are sometimes not urgent, and many of the cases have, through a great part of their progress, been referred to the digestive organs, the symptoms in the head being considered as symptomatic. A boy of 14, mentioned by Mangetus, had loss of appetite, obtuse headach, debility, and emaciation, then vomiting with more acute headach, and died after various intermissions. Three tumours were found in the brain; one in the situation of the corpora quadrigemina, and two others the size of walnuts in the substance of the brain. A young man mentioned in the Medical Observations and Inquiries, Vol. VI. had various complaints in his head and bowels which were ascribed to worms. After some time he had attacks of stupor and forgetfulness, and

died delirious. The only morbid appearance was ossification of no great extent in the dura mater, with appearances of inflammation in the membranes. Similar ossification in the falx was found by Dr Lett-som (Mem. of the Med. Soc. of London, Vol. III. p. 44.) as the only morbid appearance in a gentleman who had been long affected with a train of obscure complaints, the most urgent of which were obtuse headach, with frequent vomiting. On the other hand, it is to be kept in mind that similar ossifications have been met with in cases in which there existed no symptoms that could be ascribed to them. This part of the subject, therefore, is involved in great obscurity.

SECT. VIII.—EIGHTH CLASS.—Vertigo and Apoplectic Symptoms; Slight and Transient Apoplectic Attacks.

36. A man, aged 36. *Symptoms*.—After a wound on the head, which healed readily, constant headach for five years and a half; then fits of stupor, which came on at uncertain intervals, sometimes twice a-week, sometimes once a-fortnight; they generally lasted about an hour and a half; he had warning of their approach so as to lay himself down. In the intervals all the functions were natural. After seven or eight months the paroxysms became more frequent, and he died suddenly in one of them. *Dissection*.—A scrofulous tumour, larger than a hen's egg, lay in the middle of the left hemisphere of the brain, extending, in depth, to nearly on a line with the corpus callosum. It seemed to be merely a part of the brain in an indurated state. A piece of bone, the size of the finger nail, was attached to the left side of the longitudinal sinus. The veins on the left hemisphere were more distended with blood than those on the right. (Med. Ch. Tr. IV. 188.)

37. A woman, aged 28. *Symptoms*.—Severe headach, constant vertigo, nausea, occasional vomiting, frequent rigors, pain and deafness of the left ear, and the left eye somewhat affected. After several months the headach increased, with occasional paroxysms of coma, and she died at last rather suddenly, having been for a day or two affected with extensive erysipelas of the head and face. *Dissection*.—A remarkable tumour under the base of the brain, on the left side; it consisted of three portions; the anterior was the size of an egg, of a pink colour, and composed of a spongy vascular substance, like the texture of the placenta, interspersed with small cysts, containing puriform fluid; the posterior portion was half the size of the former, and nearly similar in structure, but firmer; the middle portion was the size of a walnut, of a white colour, and nearly cartilaginous structure. On the petrous portion of the temporal bone, where the tumour rested, the osseous substance was absorbed to the depth of half an inch.

38. A lady, aged 64. *Symptoms*.—Attacks of headach, giddiness and imperfect vision, occurring at uncertain intervals; afterwards nausea; at last, after five years, death, with fever and delirium. *Dissection*.—Two small aneurisms, each about 5-8ths of an inch in diameter, formed by dilatation of the internal carotid arteries, by the side of the sella tursica, and containing laminæ of coagulated blood. (Trans. of Soc. II. 193.)

39. A man, aged 20. *Symptoms*.—Feeling of weight in the head, frequent attacks of vertigo, followed by great weakness, prickling of the left arm, with coldness and wasting of it, and the pulse in that arm was much weaker than in the other. Found dead in bed. *Dissection*.—Brain indurated in several places; ventricles full of a puriform fluid; cerebellum covered with a cartilaginous concretion, the thickness of a six-livre piece. (Portal sur l'Apop. p. 144.)

40. A man, aged 73, (for whose case I am indebted to Dr Hunter,) about six months before his death, began to be affected with headach, and occasional attacks of giddiness and loss of recollection. He did not generally fall down, but sometimes continued walking without knowing whither he was going; at other times the attack resembled intoxication. He generally recovered his recollection in a short time. His gait was feeble and tottering, and the attacks gradually increased in frequency and in violence. At length, after one of them, more severe than usual, he was confined to bed with violent pain of the forehead, giddiness, and loss of memory; pulse 78. Bloodletting, purgatives, blistering, &c. were employed without relief; the fixed pain of the forehead continued; he became restless and incoherent, and about the 12th day from his confinement, was affected with severe pain, and partial paralysis of the left arm and leg. After three days more he had general and severe convulsion; he then lay for six days in a state of increasing weakness, but able to answer questions distinctly. After this the convulsion returned with perfect hemiplegia and coma, and he died in two days. *Dissection*.—Membranes of the brain very vascular. 3iij. of fluid in the ventricles; cerebral substance very firm. In the posterior lobe of the right hemisphere, there was a firm tumour the size of a small pigeon's egg; internally, of a pale flesh colour, and granular texture. It was not inclosed in a distinct capsule, but for a considerable part of its circumference, it was covered by a texture resembling the fibrous bands of carcinoma. The tumour communicated with the ventricle, so as to form part of the wall of the posterior and inferior cornua, and the margin of the pes-hippocampi, where it is about to descend into the inferior cornu, was attached to it. The pia mater lining the ventricle was at this place very vascular.

Many cases are on record which belong to this class, and the prin-

cial difference that they exhibit in the symptoms is, that in some of them we find constant uneasiness, with vertigo, resembling the apoplectic tendency, in others frequent and transient apoplectic attacks, the patient, in the intervals, sometimes enjoying tolerable health, in other cases complaining of a slight and habitual giddiness, commonly called weakness of the head, often accompanied by unsteadiness of the limbs. In a case of the first kind, by Zeder, he found numerous hydatids in the brain, one, particularly, in the passage to the aqueduct of Sylvius, larger than a hen's egg, and containing within it three smaller hydatids. Of the other class of cases, distinguished by frequent and transient apoplectic attacks, I have formerly given a remarkable example, in which there occurred a tumour formed by thickening of the dura mater; and I have quoted, from Lancisius, the case of a gentleman who had an apoplectic attack once or twice every month, connected with thickening of the membranes, and a polypous tumour under the frontal bone. Various other modifications occur of this form of the disease. A gentleman mentioned by Gooch had been for several years liable to attacks, in which there was sometimes a shaking of the head, and a kind of emprostotonos, at other times he became vertiginous, and fell down deprived of sense for a short time. He was never entirely free from headach, and brisk exercise excited giddiness, which went off immediately upon resting. He died suddenly in convulsion, and on dissection there were found several osseous points arising from the right parietal and occipital bones, and irritating the dura mater, which was inflamed and beginning to mortify. (Gooch's Appendix, p. 237.)

To this class also belong the cases in which, connected with organic disease in the brain, there has occurred a gradual abolition of the mental faculties, with little complaint of pain, or any other urgent symptom. In a case of this kind, which terminated in perfect stupidity or lethargy, Platerus found a firm fleshy-looking tumour the size of a moderate apple, above the corpus callosum. (Plateri, Obs. Lib. I. p. 13.)

To this very imperfect view of the important subject of organic disease of the brain, I shall only add a tabular view of the cases which have been either described or referred to. From this it will appear that it is difficult or impossible to fix upon any general principles, or to refer the particular character of the symptoms to any thing in the nature or seat of the disease, and that the whole subject is still involved in much obscurity. Tumours, for example, will be found under the first class, some of them of large size, unaccompanied by any remarkable symptom; while tumours in the same situation, under the other classes, were accompanied by blindness, convulsions, or paralysis. It does not appear, that these diversities depend upon the size of the tumours, or, as far as we know, upon these

particular structure ; but these points remain to be investigated, particularly what diversity of symptoms are connected with the nature of the tumours, and especially with their characters, as being tumours distinct from the cerebral mass, or as being indurations of part of the brain itself.

Many of these cases seem to illustrate the doctrine which I formerly proposed in regard to pressure on the brain. I have contended, that causes which are supposed to act in this manner, produce their effects, not by compression of the cerebral matter, but by their influence upon the blood-vessels of the brain, in destroying that relation betwixt the arteries and veins of the brain, which, in an organ closely confined in a cavity of bone, must be essential to a healthy state of the circulation. I have endeavoured to trace the manner in which compressing causes may exist in a very considerable degree, without thus affecting the circulation, and, consequently, without producing coma ; and I have mentioned cases, which I think could only be explained on this principle, in which extensive effusion existed in the brain, without coma. I see no other principle on which we can account for many of the cases of organic disease. In some of them, tumours of a great size were fatal, without coma ; and in many more, though coma existed for a short time before death, there was every reason to believe that it was connected with a recent inflammatory action, and did not depend immediately on the original disease.

In regard to the treatment of these diseases, there is little to be said. I am persuaded, however, that we ought not to consider them all as hopeless. Many of them certainly have their origin in inflammatory action, and, by the proper treatment, we have every reason to suppose that their progress may at least be impeded, and the life of the patient prolonged, as well as rendered more comfortable. This treatment will consist in keeping the system extremely low by evacuations and spare diet, cold applications to the head, issues or setons in the neck, and avoiding all causes of excitement.

TABLE OF CASES OF ORGANIC DISEASE OF THE BRAIN.

Prominent Symptoms.	Morbid Appearances.
Long continued headach, without any other urgent symptom.	Tumour, five inches in circumference, attached to the falx. ———— the size of a walnut, behind the medulla oblongata. ———— the size of a pigeon's egg, at the upper and middle part of right hemisphere. ———— three inches broad, adhering to the membranes, by the side of the third sinus. ———— hard, irregular, and of a stony consistence, near the torcular. ———— stony, like a mulberry, in substance of the brain. ———— the size of a nutmeg, in the seat of the pineal gland. ———— the size of a pigeon's egg, in the substance of the cerebellum. Small triangular ossification in the falx.
Headach. Blindness.	Tumour, the size of an egg, attached to the anterior part of tentorium. ———— the size of an egg, between the optic nerves. ———— the size of a large walnut on lower and anterior part of left hemisphere. ———— larger than an egg, compressing the optic nerves. ———— the size of a fist between the brain and cerebellum. Pineal gland enlarged to the size of an egg, and of an earthy consistence. Cyst in left hemisphere, containing 3ij. of pure albuminous fluid.
Headach. Blindness. Convulsion.	Tumour, the size of a walnut, on the sella tursica. ———— the size of a small orange, on petrous portion of left temporal bone. ———— the size of a bean, on left side of pons Varolii. ———— osseous, three inches broad, on inner surface of left parietal bone. ———— larger than an egg, in the substance of left hemisphere. ———— two inches long, in posterior lobe of left hemisphere. Four hard tubercles, each an inch in diameter, in right hemisphere, and one in right. Cyst like a hydatid, three inches long, in substance of right hemisphere.
Headach. Convulsion. Loss of Smell.	Tumour in the substance of anterior part of right hemisphere.
Headach. Convulsion.	Tumour, the size of a nut in the left lobe of the cerebellum. ———— the size of an egg, in the fourth ventricle.

Prominent Symptoms.	Morbid Appearances.
Epilepsy.	Tumour of the dura mater, projecting outwards through an opening in the bone. Hydatid, the size of a pigeon's egg, in posterior part of the Induration of pons Varolii. [right hemisphere. _____ of posterior part of both hemispheres. Three tubercles in dura mater, on right side, and one in right hemisphere. Seven sarcomatous tumours near longitudinal sinus, and one in corpus striatum. Firm gelatinous substance under dura mater. Bony spiculæ between the dura mater and pia mater. Irregular piece of bone in cerebellum, one inch long, and half an inch broad.
— the convulsion confined to the right side of the body.	{ Tumour, the size of an egg, on surface of left hemisphere. { Induration of part of left hemisphere, with thickening of dura mater.
Head symptoms, with Hemiplegia.	Tumour, the size of a hazel nut on left side of tuber annulare. _____ the size of an egg, on surface of anterior part of left hemisphere. _____ three inches long, attached to the third sinus. Two encysted tumours on surface of brain, (palsy of the arm Large hydatid in the left ventricle. [only.)
Do. with Paraplegia.	Induration of left lobe of cerebellum, and suppuration of right. Scirrhus of left lobe of cerebellum. Tumour, the size of an egg, in left hemisphere, (universal [paralysis.) Two tumours on the pons Varolii.
Stomach remarkably affected.	Induration of surface of cerebellum, with thickening of membranes. Tumour the size of a walnut, under the cerebellum. _____ in seat of corpora quadrigemina, and two in sub-Ossification in dura mater. [stance of brain. Ditto in falx.
Comatose or apoplectic attacks.	Tumour, larger than an egg, in left hemisphere. _____ remarkable lobulated, under base of brain, on the left side, _____ five inches long, from thickening of dura mater, on top of right hemisphere. _____ size of a pigeon's egg in posterior part of right hemisphere. _____ Polypous under the frontal bone. Two small aneurisms of internal carotid. Induration of brain in various places. Numerous hydatids in the brain. Osseous projections from the inner surface of the occipital and right parietal bones. Tumour, the size of an apple, above the corpus callosum, (gradual loss of intellect.)

Date	Notes
	Methylamine
	A mixture of the two isomers, prepared by the action of
	hydrogen cyanide on methyl iodide, is a colorless, volatile
	liquid, boiling at 6.5°C. It is soluble in water and in
	alcohol. It is a weak base, forming a salt with acids.
	The reaction of methylamine with acids is as follows:
	$\text{CH}_3\text{NH}_2 + \text{H}^+ \rightarrow \text{CH}_3\text{NH}_3^+$
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