**Observations on chronic inflammation of the brain and its membranes / by John Abercrombie.**

With the Authors Compts



# OBSERVATIONS

ON

# CHRONIC INFLAMMATION OF THE BRAIN AND ITS MEMBRANES.

By JOHN ABERCROMBIE, M. D:

FELLOW OF THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

# OBSERVATIONS

ON

# CHRONIC INFLAMMATION OF THE BRAIN

AND ITS MEMBRANES.

By JOHN ABERCROMBIE, M.D.

FELLOW OF THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

# OBSERVATIONS

ON

# CHRONIC INFLAMMATION OF THE BRAIN AND ITS MEMBRANES.

By JOHN ABERCROMBIE, M. D.

FELLOW OF THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

---

[From the Edinburgh Medical and Surgical Journal, No. 55.]

---

THE most common diseases are the most important. Rare and singular affections may excite curiosity, but the real improvement of medical science will be best promoted by a faithful record of facts, calculated to illustrate those diseases which excite our daily interest by their frequency and their danger. Among these may justly be reckoned the affections of the Brain. In their varied forms, they meet us at every age, and in every rank; they often set at defiance our most powerful remedies; and, after being rapidly fatal, they frequently leave in the important organ affected, so slight and imperfect traces of their nature, that we are only left to contemplate the fallacy of our doctrines, and the inefficiency of our most powerful remedies.

Diseases of the brain may be divided into three classes, the inflammatory, the apoplectic, and the organic. Active inflammation of the brain is in this country so uncommon, that some have doubted whether it really exists as an idiopathic disease. For this reason, I confine my observations to Chronic Inflamma-

tion. I include under this term all those affections of the brain, which, beginning with symptoms of an inflammatory nature, terminate either by suppuration or effusion, and I do not comprehend serous apoplexy, which, beginning with apoplectic symptoms, belongs to another branch of the subject. Those affections which I include under chronic inflammation, appear under various degrees of activity. Some of them are evidently examples of the pure scrofulous inflammation, while others approach to the characters of acute phrenitis, and on this account there may be some objection to the term. But as they pass into one another by almost insensible gradations, and are intimately allied in their symptoms and their terminations, and as none of them exhibit all the characters laid down by systematic writers as those of Phrenitis, it appears to me, that it will simplify the subject, if we consider them all under the general term Chronic Inflammation.

The reasons will appear in the sequel, which lead to believe, that the varied forms in which we meet with this affection are not different diseases, but different terminations of the same disease.

## Sect. I.—Symptoms of Chronic Inflammation of the Brain.

When we attend to the symptoms of chronic inflammation of the brain, we find them assuming various forms, which I think may be referred to four classes.

I. The first form of the disease most commonly affects children, but may also appear in adults. It is usually preceded for a day or two by languor and peevishness; these are followed by an accession of fever, which is sometimes ushered in by severe shivering. The patient is oppressed, and unwilling to be disturbed, and complains of severe pain in some part of the head, with flushing of the face, and impatience of light. In many cases there is frequent vomiting, which continues for the first day or two; in other cases, the vomiting is absent. The pain is felt in various parts of the head; frequently it extends along the neck, and even to the shoulders, and sometimes pain is complained of in the arms, and other parts of the body. The pupil is usually contracted; the eye morbidly sensible, and sometimes suffused; the tongue is generally white, but moist, sometimes quite clean; the sleep is disturbed by starting and frightful dreams, and frequently during sleep there is violent grinding of the teeth. The bowels are generally obstinate, but frequently they are natural, and I have seen the disease through its whole course attended by spontaneous diarrhœa. After some days, slight delirium begins to appear, at first transient, perhaps only

observed during the night, or upon first awaking out of sleep, or, in some cases, the patient lies in a dosing state, and talking incoherently, but out of which he can be roused, so as to talk sensibly. In other cases, instead of delirium, there occurs a peculiar forgetfulness, the patient using one word instead of another, misnaming persons and things, mistaking the day, or the time of the day, or shewing in some similar manner a confusion of thought. Sometimes he is sensible of it, and appears anxious to correct the mistakes he has made. These symptoms are followed by a tendency to sleep, and this soon passes into coma. While these changes are going on, the pulse, which was at first frequent, usually falls to the natural standard, or below it; the pain becomes less violent; the eye loses its sensibility, becoming dull and vacant, often with squinting and double vision, and these are often succeeded by blindness and dilated pupil, even before the patient falls into perfect coma. The pulse having continued slow for some time, usually a day or two, sometimes but a few hours, begins to rise again, and rises to extreme frequency; it has been counted as high as 200 in the minute. It is through the whole course of the disease extremely unequal in frequency, varying perhaps every minute, or every time that it is counted. This remarkable inequality is not observed in other febrile diseases, except from some temporary cause, and is therefore a symptom which deserves much attention. The patient is now in a state of perfect coma, sometimes accompanied by paralysis of some of the limbs, sometimes by convulsive affections, and, after he has continued in this state for a few days, the disease is fatal. The duration of the complaint is extremely various; it is sometimes drawn out to three weeks, and sometimes, especially in young children, it is fatal in five or six days. At some period of the disease, there is generally a remarkable remission of all the symptoms, which gives sanguine, but deceitful hopes of recovery; it usually occurs, as the pulse is falling in frequency, or when it is beginning to rise after the slowness, and is the prelude to the coma. In some cases the slowness of the pulse does not occur, but it continues through the whole course of the disease of nearly uniform frequency.

In young children, who cannot describe their feelings, this form of the disease is characterized by fever, flushing, restlessness, and screaming, often with vomiting; these symptoms are succeeded in a few days by stupor and squinting, the pulse coming down as the stupor appears. This falling of the pulse, while the child continues in a state of great oppression, approaching to coma, is often the first symptom that points out the character of the disease.

II. The second form I have observed most commonly in young persons towards the age of puberty, and upwards. It begins like a slight feverish disorder, and for a considerable time excites no alarm. There is slight headach, general uneasiness of the limbs, disturbed sleep, and impaired appetite; the tongue is foul, and the pulse slightly frequent, probably from 96 to 100. After a few days, the complaint appears to be going off; at our next visit, we are disappointed to find the patient again complaining, perhaps as much as at first. More active practice is then employed, and there is again appearance of amendment. The tongue perhaps becomes clean; there is some appetite, and better sleep, but there is still some complaint of headach, which varies much in degree from one day to another, never severe, and never quite gone: the pulse continues a little frequent. Amid these remissions and aggravations, eight or ten days may pass before the disease has assumed any decided character. It is not perhaps before the sixth or seventh day that even an attentive observer begins to remark, that the degree of headach, though not severe, is greater, and more constant, than corresponds with the general symptoms of fever; that the tongue is becoming clean, the appetite improving, and the pulse coming down, while the headach continues, with an unwillingness to be disturbed, and a degree of oppression, that is not accounted for by the degree of fever. In this way, the complaint may go on for several days more, till perhaps about the twelfth or fourteenth day, the pulse suddenly falls to the natural standard, or below it, while the headach is increased, with a tendency to stupor. This instantly marks a head affection of the most dangerous character. The patient now lies for several days in a state of considerable stupor, sometimes with convulsion, often with squinting, and double vision. The pulse then begins to rise again, and about this time there is frequently a deceitful interval of apparent amendment; the stupor is lessened, the patient appears easy and intelligent, sometimes the squinting goes off, and the eye appears natural; but he soon relapses into perfect coma, and dies in three or four days. The duration of the complaint is uncertain; it may be drawn out to five or six weeks, or it may be fatal in two or three. When this form of the disease attacks infants, they are first observed to be languid, and oppressed, with bad appetite, and disturbed sleep. There is often a disordered state of the bowels, and to this cause the symptoms are ascribed. There is no urgent symptom, and no alarm is excited till, after eight or ten days, the pulse is found at 70 or 60, the pupil dilated, the eye fixed and vacant, and the child oppressed, tending to stupor. These symptoms are soon followed by coma, with squinting, and in a few days by death.

III. The third form of the disease I have usually observed in adults. It begins with violent headach, without fever. The patient is found in bed, lying oppressed, and unwilling to be disturbed, or tossing about from the violence of the pain. The pulse is about the natural standard, or below it, frequently about 60. The face is in some cases flushed, in others rather pale. In some cases the eye is natural, in others, there is impatience of light, with contracted pupil. The pain is usually very acute, and deep-seated, and is referred to various parts of the head—frequently it seems to shoot from temple to temple—and sometimes it is referred to the ear. There is a look of much oppression, and in some cases vomiting. Sometimes delirium appears at an early period, varying in degree from day to day, until, after six or seven days, it passes into fatal coma, the pulse having continued through the whole course of the disease from 70 to 80. In other cases, the pulse is at first about the natural standard, afterwards falls to 60 or 50, and at last rises to 120 or 130. In some cases, the vision is not affected; in others squinting, and double vision occur; and sometimes these symptoms, after continuing a day or two, disappear, not to return; the disease, notwithstanding, going on to a fatal termination. There is in every case more or less delirium, but often slight and transient. Sometimes the patient lies in a dosing state, with incoherent muttering, but can be roused to talk sensibly. This condition, when not accompanied by fever, is always characteristic of a dangerous affection of the head. There is frequently observed, that peculiar forgetfulness, and confusion of thought, which I have already mentioned, and which I think is different from any thing that occurs in continued fever. Sometimes the speech is affected, and this may be either difficulty of articulation, or a hesitation, from the patient not being able to recollect the word which he meant to make use of. There is generally towards the end more or less coma; in some cases, it continues three or four days; in others not above twelve hours, and sometimes the disease is fatal without perfect coma,—the patient being able to answer questions distinctly, a very short time before his death.

IV. In another and very frequent form of the disease, the first symptom that excites alarm is a sudden and violent attack of convulsion. This in some cases occurs without any previous illness; in others, it is preceded by slight complaints, which had attracted little attention. In one case, which will be described, it was preceded by frequent vomiting, which had continued a fortnight; in another, by headach for several days. The convulsion is generally long and severe. In some cases, it is fol-

lowed immediately by coma, which in a few days is fatal. In other cases, the convulsion recurs frequently at short intervals, the patient in the intervals complaining of headach, and after twelve or twenty-four hours, passes into coma. Sometimes after the coma has continued a considerable time, perhaps twelve hours, there is complete recovery from it, and for several days the patient appears to be in the most favourable state, when, without any warning, the convulsion returns, and terminates in fatal coma. In some cases, the convulsion is confined to one side of the body, or to one extremity, and is usually followed by paralysis of the part affected, the disease in the end passing into coma.

Much observation is required to put us fully on our guard against the deceitful appearances of amendment that take place in all the forms of this disease. Even in those which have assumed the most formidable aspect, every alarming symptom may subside. The pulse perhaps continues frequent, but it also is coming down; at our successive visits, we find it falling regularly, and we are disposed to hope, that a few days will bring the case to a favourable termination. During this deceitful interval, which may continue several days, I have known a parent tell the medical attendant, that his farther visits were unnecessary; and I have known a physician take his leave, considering his patient as convalescent. As the pulse falls, the patient is disposed to sleep—this is perhaps considered as favourable—it falls to the natural standard; "he sleeps almost constantly," and in another day, this sleep terminates in coma. The pulse then begins to rise again, rises to extreme frequency, and in a few days more the patient dies. All this may go on with little or no complaint of the head, and without any symptom that will lead a superficial observer to suspect danger, till he finds his patient glide into coma, at the very time when he expects recovery; for the period when the pulse falls to the natural standard, is the time when the coma becomes evident, and the situation of the patient probably hopeless. Whenever, therefore, at any period of a febrile disorder, there have been remarkable symptoms in the head, such as violent headach, with vomiting, and impatience of light, stupor, convulsive affections, or affections of the sight, though these symptoms have entirely subsided, and the complaint again has assumed the appearance of simple fever, we must not consider the danger as over, but must be on our guard against a period of danger that is still before us. An attentive observer may generally remark, in such cases, something which leads him to suspect that the appearance of amendment is deceitful. Sometimes there is a dilated state of the pupil, giving to the eye a peculiar expression; sometimes

a remarkable tendency to sleep: frequently something unusual may be observed in the patient's manner, such as fretfulness and querulousness, which are not natural to him; a quick and hurried way of speaking, or, on the contrary, a remarkable slowness of speech; difficult articulation, or a peculiar confusion of thought and forgetfulness on particular subjects; but it cannot be too strongly impressed upon the younger part of the profession, that cases occur, in which all these symptoms are wanting, and in which the patient appears for several days to be in the most favourable way of recovery, while, in fact, his disease is advancing rapidly to a fatal termination.

Chronic inflammation of the brain is not always an idiopathic disease. It often takes place in the course of other diseases, the most common of which are continued fever, scarlatina, measles, pneumonia, phthisis, and diseases of the kidneys. It may be useful, therefore, to keep in view those symptoms which, in the course of any disease, indicate a tendency to this dangerous affection of the brain. They are chiefly the following; in the *head*, violent headach, with throbbing, giddiness, tinnitus, sense of weight and fulness, stupor, a great propensity to sleep—in the *eye*, impatience of light, unusual contraction or dilatation of the pupil, blindness, double vision, squinting, distortion of the eyes outwards, paralysis of the muscles of the eyelids, producing, according to the muscle that is affected, either a shut eye, or a gaping eye, transient attacks of blindness, or double vision, objects seen that do not exist, a long-sighted person suddenly recovering distinct vision; in the *ear*, transient attacks of deafness, great noise in the ear, unusual acuteness of hearing; in the *speech*, indistinct or difficult articulation, unusual quickness of speech, or unusual slowness; in the *pulse*, slowness, and remarkable variations in frequency; in the *mind*, high delirium, transient fits of incoherence, peculiar confusion of thought and forgetfulness on particular topics; in the *muscles*, paralytic and convulsive affections, sometimes confined to one limb, or part of a limb; in the *urine*, there frequently occurs a remarkable diminution of the secretion, sometimes nearly amounting to suspension of it; and connected with this diminution, there is often a frequent desire to pass urine, occasioned probably by an increased acrimony, as the quantity diminishes. Of as great importance as any particular symptom, is attention to the correspondence of the symptoms: Thus, the peculiar oppression which accompanies a high degree of fever, is familiar to every one, and is not reckoned an unfavourable symptom; —the same degree of oppression occurring without fever, or with very slight fever, would indicate a head affection of the

most dangerous character. In the same manner, a degree of headach and of delirium, which, accompanying a high degree of fever, would be considered as symptomatic, accompanying slight fever, would indicate a dangerous affection of the brain.

The TERMINATIONS of chronic inflammation of the brain may be referred to the following heads.

1. The disease may be fatal in the inflammatory stage.

2. *Serous effusion.* This may take place either in the ventricles or on the surface. When it is in the ventricles, it generally is found in all of them, owing to their free communication with each other. On the surface, it is generally between the pia mater and the arachnoid membrane, elevating the latter, so as, from its extreme tenuity, to impart to the effusion a gelatinous appearance; it may also occur between the arachnoid membrane and the dura mater, and this is probably the source of the fluid which is often found in the base of the cranium, after the brain is removed. There is reason to suppose, that, in some cases, it is also formed between the dura mater and the bone, and that this may be the source of the fluid which often escapes in considerable quantity while the cranium is opened.

3. *Suppuration.* This also occurs in various situations. Sometimes an extensive portion of the brain, perhaps nearly a whole hemisphere, is found broken down into a soft corrupted mass, in which soft cerebral substance is mixed with purulent matter. In other cases, the pus is in a circumscribed abscess, lined by a sac of coagulable lymph. Sometimes it is found in the ventricles, and frequently upon the surface betwixt the membranes. Abscess of the cerebellum is a frequent appearance, and an example will be given of abscess in the medulla oblongata.

4. *A peculiar destruction or disorganization of the central parts of the brain,*—the fornix, septum lucidum, and the white medullary matter which lines the ventricles. This I consider as an appearance of very great importance, and one which, perhaps, has been too little attended to. It consists of those parts being broken down into a white soft pulpy mass, retaining their natural colour, but losing their figure and consistence, so that the fornix cannot be raised, and the septum lucidum is found perforated by a large ragged opening. This appearance I have generally observed in those cases in which there has been severe and deep-seated pain. It is often combined with the deposition of coagulable lymph in the immediate vicinity of the parts affected, as, on the upper surface of the cerebellum, it is often combined with suppuration in other parts of the brain, very often with serous effusion in the ventricles; and I think there is

no reason to doubt that it is the termination of inflammation of these central parts, probably a modification of suppuration, and deriving its peculiar character from their particular structure. I see no other principle on which we can explain it, except we suppose it to be produced by the distention of parts which arises from the effusion, and that this is not the source of it, appears from this fact, that it is met with in cases in which there is no effusion.

5. *Deposition of coagulable lymph.* This may either appear, forming an adventitious membrane on the surface of the pia mater, or in a soft and gelatinous state in various parts, especially about the medulla oblongata, which is sometimes found imbedded in it.

6 Thickening of the membranes, contraction of the sinuses, caries of the bones, and other affections of the external parts, which will be more particularly referred to in the sequel.

In the pathology of this affection, too much attention has perhaps been directed to the serous effusion, or hydrocephalus, as if this alone constituted the disease. This effusion is probably to be considered as one of the many terminations of chronic inflammation of the brain. Some of the other terminations are scarcely less frequent, particularly that peculiar destruction of the central parts, to which I have alluded, and with which the effusion is found to be combined, in a very great proportion of the ordinary cases of hydrocephalus; other cases, in which the symptoms closely resemble those of hydrocephalus, will be found to terminate by extensive undefined suppuration, or by this, combined with effusion, or with the destruction of the central parts. In fact, we do not often meet with any one of the terminations uncombined, and it is very difficult to anticipate from the symptoms, in what manner the disease is to terminate, or has terminated in a particular case. Serous effusion, uncombined with any other morbid appearance, I have generally observed in that which I have described as the second form of the disease, in which the symptoms are very slow and insidious in their progress, and at no period exhibit much activity. In those cases in which the pain is more severe, and all the symptoms more acute and more violent, I have commonly found either effusion combined with the destruction of the central parts, or undefined suppuration. In that which I have described as the fourth form of the disease, I have commonly observed either the encysted abscess, or the deposition of an adventitious membrane, on the surface of the pia mater. But these terminations are often combined with one another, and all of them are generally combined with more or less serous effusion. On

what these varieties depend is very much matter of conjecture, probably on the seat of the disease. The superficial adventitious membrane probably arises from inflammation of the pia mater, and the destruction of the fornix and septum lucidum from inflammation of these parts. The same appearance is observed in the inner surface of the ventricles, but in some cases suppuration is observed there also. The cortical or cineritious part would appear to be the most frequent seat of suppuration, but it is by no means confined to this structure; and upon the whole this part of the subject is little better than conjecture.

## Sect. II.—Examples of the principal Forms and Terminations of the Disease.

The various forms of disease which have been described in the preceding section, exhibit a general view of the symptoms of chronic inflammation of the brain. The morbid condition with which they are connected, I believe to be primarily the same in all of them, but the symptoms are modified by a variety of circumstances, the particular effect of which has not been fully investigated. These circumstances may be chiefly referred to three heads, the constitution of the patient, the seat of the disease, and the mode of its termination. 1. They are modified by the constitution of the patient, as from this source they probably derive their character in regard to activity, in one case approaching to the nature of acute phrenitis, in another, consisting of the pure scrofulous inflammation, with the smallest degree of activity, and in others forming numerous modifications, by which these two extreme cases are connected together by almost insensible gradations. 2. They are probably modified by the seat of the disease. We have reason to believe that, in this respect, there are considerable varieties; that the inflammation may be seated in the deep or central parts of the brain—in the substance of the hemispheres—in the membranes—in the cerebellum—in the medulla oblongata, &c. The effects of these varieties remain to be investigated; but they form a very difficult subject of investigation, from the difficulty of ascertaining what part was really the seat of the inflammation, and from the facility with which it may pass from one part to another. 3. The varieties of termination present sources of difference not less interesting than the former, and more within the reach of observation. These varieties have already been alluded to; the disease may be fatal in the inflammatory stage,—it may terminate by serous effusion—by suppuration—by deposition of new matter on the surface—by a peculiar disorganization of the central parts, and by various combinations of these terminations. It may be of some use towards

illustrating this most important and dangerous disorder, if I describe a selection of cases, calculated to exemplify the principal varieties in the symptoms and terminations, and some of the more remarkable differences in the seat of the disease.

I.—*The disease fatal in the inflammatory stage.*

Case 1.—A woman, aged 26, had laboured under bad health, in a variety of forms, for eighteen months before her death. Her complaints began with severe headach and frequent attacks of convulsion. After some time these complaints subsided, and she was seized with cough, hæmoptysis, quick and laborious breathing, and scarcity of urine. The complaint of her breathing came on in paroxysms, during which her respiration was 80 or 90 in the minute, and sometimes continued nearly in this state for several days together. Her pulse was constantly frequent. After she had suffered for many months from these complaints, they subsided entirely, without any obvious cause. She then became affected with violent paroxysms of pain in the abdomen, dysuria, and vomiting. The pain was principally in the right side of the abdomen, which was swelled, tense, and painful upon pressure, and the paroxysms were succeeded by copious discharges of puriform fluid by the vagina. There was a temporary alleviation of the pain after every discharge of this fluid. The last time I saw her, which was a few weeks before her death, there was a general swelling and hardness occupying the whole right side of the abdomen, extremely tender to the touch, and conveying the impression of extensive organic disease. I did not see her in the fatal attack, which was in the head. It began with severe headach, impatience of light, and fever; these were succeeded by convulsion, and this by coma, and she died comatose, about a week after the appearance of these symptoms. On *dissection*, I found the surface of the brain, in many places, of a dark red colour. This appearance extended in some places to the depth of an inch into the substance of the brain, and it was principally observed on the upper and anterior parts of both hemispheres, and on the posterior part of the left hemisphere. The parts so affected were softer than the other parts of the brain, and appeared to be more vascular, for drops of blood exuded from them when they were cut. The internal parts of the brain were sound, and there was no serous effusion. The longitudinal sinus, near its posterior part, was thickened in its coats so as considerably to diminish its area. The hardness of the abdomen, which was so remarkable a short time before death, had disappeared, and not a vestige of disease could be detected in any of the viscera of the thorax, abdomen, or pelvis.

× there must have been disease in y^e Abd^n at one time,

II.—*Serous effusion.*

Case 2.—A boy, aged 9, was affected with slight headach, foul tongue, bad appetite, and disturbed sleep. Pulse from 96 to 100. He was not at first confined to bed, and the complaint excited little attention. The first week of his illness was passed with these slight symptoms; he was one day better, and another rather worse; his headach sometimes gone for great part of a day, and never severe. Towards the end of the second week there appeared to be a want of correspondence in the symptoms, the headach being greater and more permanent than accorded with the degree of fever; but even on the 13th and 14th days, the complaint had still much the appearance of mild continued fever, and was considered in that light by a practitioner of the first eminence. During the second week, however, the headach had become more severe, while the other febrile symptoms had been diminishing. On the fifteenth day the pulse sunk rather suddenly to 70, and the headach was increased. On the sixteenth day there was a slight convulsion. On the seventeenth there was coma, with some squinting; the pulse below the natural standard. On the eighteenth the pulse began to rise, and the coma was diminished. On the nineteenth and twentieth he was distinct and intelligent; tongue clean; some appetite; pulse 96. On the following day his appearance was less favourable. He then sunk gradually into coma, with squinting, and died about the thirtieth day of the disease. The pulse had risen to 120, and in the last week there had been some slight return of convulsion. On *dissection*, all the ventricles of the brain were found distended with clear serous fluid. There was no other morbid appearance, except considerable turgidity of vessels on the surface of the brain.

Case 3.—Mr M. aged 24, was affected with slight headach, with unusual listlessness and indolence. He ascribed the complaint to cold, and for the first week continued to attend to his business. In the second week he had considerable headach, shivering, debility, bad appetite, foul tongue, and disturbed sleep. Pulse about 112. Towards the end of this week his friends observed once or twice a slight and peculiar forgetfulness. In the third week his pulse came down rapidly to 72; his tongue became clean; he made little or no complaint of his head, but there was occasionally a degree of incoherence, which was slight and transient, and a singular forgetfulness on particular subjects, which was observed by his friends, but did not appear in his intercourse with his medical attendants. The pulse continued slow for two days, and then rose rapidly to 130, with

increase of the delirium. After a few days more the delirium again subsided, and his attendants entertained hopes of his recovery; but it soon returned, and was rapidly followed by blindness, coma, and death. He died about the middle of the fourth week of his illness. I did not see him during his life. I examined his body, and found all the ventricles of the brain distended with serum. There was no other morbid appearance.

III.—*Peculiar destruction of the central parts of the brain, without effusion.*

Case 4.—Mrs R. aged about 30, (18th June 1816,) was affected with violent pain of the head, which extended across from temple to temple. She was extremely restless, and tossing from one side of the bed to the other, owing to the intensity of the pain; eyes slightly suffused, and impatient of light; pupils contracted; pulse 60, soft, and rather weak; tongue white; had been ill several days.

She was bled copiously and repeatedly. Used strong purgatives; cold applications to the head; blistering, and topical bleeding.

For three days she appeared much relieved; the violent pain was removed; she complained only of pain when she moved her head. Pulse from 80 to 90. She was quite sensible, but considerably oppressed, and inclined to lie without being disturbed. On the 22d her speech was affected; she was sensible of it herself, and said she "felt a difficulty in getting out her words." Pulse 112.

23d, 24th.—Increasing stupor, and at times incoherence; but when roused, answered questions distinctly. Double vision; made no complaint; said her head was better. Pulse from 112 to 120.

25th.—Increasing stupor; pulse less frequent.

26th.—Complete coma; dilated pupil. Pulse 108, of good strength.

Died in the night. More blood-letting, general and topical, mercury, &c. had been used without benefit.

*Dissection.* The fornix and septum lucidum were broken down into a soft white pulpy mass. There was no effusion in the ventricles; and the other parts of the brain appeared to be in the most healthy state.

IV.—*Peculiar destruction of the central parts, combined with effusion.*

Case 5.—J. N. a stout young man, aged 20, (18th September 1814,) was affected with violent headach, extreme restlessness,

and some delirium; face flushed; pulse 60. Had been unwell so as to keep the house for a week, but only occasionally in bed; symptoms much increased for two days. Pulse on the former days had been from 80 to 90.

19th, 20th.—No improvement; violent headach; a good deal of delirium. Pulse from 75 to 80. Large and repeated blood-letting, cold applications, blistering, purging, &c. were employed.

21st, 22d.—Headach easier; less delirium; pulse 80.

23d, 24th.—Continued better. Pulse from 80 to 84.

25th.—A tendency to stupor; began not to know those about him.

27th.—The stupor had increased to perfect coma, in which state he lay for four days, and died. His pulse had continued from 75 to 84.

*Dissection.*—Much effusion in the ventricles, and a good deal found in the base of the skull. The fornix was broken down into a shapeless mass of white pulpy matter. From similar destruction a large opening had been formed in the septum lucidum, and the cerebral substance, forming the inner surface of the lateral ventricles, had the same soft pulpy appearance. There was considerable deposition of coagulable lymph on the upper surface of the cerebellum.

Case 6.—D. G. a printer, aged 21, (3d September 1816,) was affected with violent headach and impatience of light; frequent vomiting; had an oppressed look, with unfixed expression of his eyes. Pulse 70, and strong. Tongue clean. Had been ill six days; for three days had vomited almost every thing he had taken.

Large blood-letting, purging, blistering, &c. were employed, and afterwards mercury, and an issue in the neck.

4th.—Vomiting abated; headach relieved; pulse 54.

5th.—Pulse 56; headach much relieved; no vomiting.

7th.—No headach; eyes bore the light; look natural; pulse 48; double vision occasionally, not constant.

9th.—Sitting up, and dressed; pulse 60; no pain; constant double vision; tongue clean; some appetite.

10th.—Vision natural; in other respects as before.

11th.—Pulse 96. Made no complaint; but his look was vacant, and the pupils dilated; and there had been some delirium in the night; tongue clean; bowels open; vision natural.

12th.—Pulse 96. Considerable delirium; no complaint of his head; vision natural.

13th.—Increasing stupor.

14th.—Perfect coma. Pulse 120.

15th.—Died.

*Dissection.*—All the ventricles were distended with fluid. The fornix was broken down into a soft pulpy mass, which could not be raised; other parts of the brain healthy.

### V.—*Suppuration without effusion.*

Case 7.—A girl, aged 11, thin and delicate, after having complained for some days of headach, was seized on the 11th of January 1817 with convulsion, which continued about half an hour. I saw her on the 12th, and found her affected with severe headach and paralysis of the right arm, which had taken place immediately after the convulsion. The pulse was 100; the tongue foul; the face rather pale; and the eyes languid. Being bled from the arm and purged, and cold being applied to the head, she was much relieved. On the 13th the pulse was natural; the pain much abated, and she had recovered considerable motion of the arm. On the 15th, the headach being increased and the arm more paralytic, she was bled again; and, on the 17th, she was much relieved; pulse natural, and the motion of the arm much improved. On the 18th, after being affected with increase of headach and some vomiting, she became convulsed; the convulsion was confined to the head and the right arm; the former was drawn towards the right side, with rolling motion of the eyes; the arm was in constant and violent motion. Pulse 100. She was sensible, and complained of her head. Being bled to ℥viij., the convulsion ceased instantly, and the headach was relieved, but the right arm was left in a state of complete paralysis. 19th and 20th, the arm had recovered a little motion. Some headach continued, with occasional vomiting. Pulse 60. On the three following days the same convulsive motion returned several times. It now did not affect the head or face, but was confined to the right arm, which was then left in a state of permanent paralysis. Hitherto no other part of the body had been affected by the convulsion, but on the 24th, the right thigh and leg were affected by it, and remained in a state of paralysis. Pulse 60. The usual remedies, bleeding, purging, blistering, &c. had been employed with activity, without any effect in arresting the progress of the disease. The right thigh and leg now went through a course similar to that described in the arm; and, on the 29th, remained in a state of permanent paralysis. When the convulsion first began to affect the leg, the arm was affected at the same time, but afterwards it was confined to the thigh and leg, the arm remaining motionless. February 4th, Complete paralysis of the

right side; continued quite sensible. Pulse from 50 to 60; no return of convulsion; little complaint.

She now continued for several days without any change; except the paralysis of the right side every function was natural. She was quite sensible; appetite good. Pulse and vision natural, and she made little complaint. She was, however, inclined to lie without being disturbed, and gradually became more oppressed. On the 11th this had increased to perfect coma, in which she continued for three days, and died on the 14th.

*Dissection.*—In the upper part of the left hemisphere of the brain, there were two abscesses, containing together from 6 to 8 ounces of very fetid pus. They had no communication with each other, nor with the ventricle. The one was in the anterior part of the hemisphere, very near the surface; and the other immediately behind it, separated by a thin septum of firm white matter; a similar white matter formed the lining of the abscesses. In the posterior part of the right hemisphere, there was a small abscess containing probably half an ounce of pus. There was no serous effusion in any part of the brain, and no other morbid appearance.

VI.—*Suppuration combined with serous effusion.*

Case 8.—Mr C. aged 18, had been for many years affected with a considerable degree of deafness, and had been liable to suppuration of the ears. In 1810 he was affected with a chronic abscess behind the left ear, by which a probe could be passed to a great depth into the cells of the mastoid process. This sore discharged for more than a year, and then healed, leaving a deep cicatrix. From this time he was liable to headach, which became more severe in the beginning of 1813.

May 14, 1813.—After being for some days languid and complaining a little of his head, he was seized with severe headach and frequent vomiting; was much oppressed, and disposed to lie in a dosing state without being disturbed. Pulse 60.

He was treated by large and repeated blood-letting, purging, topical bleeding, blistering, and then mercury.

15th.—Vomiting abated; headach violent; pulse 60. Several severe attacks of shivering; was oppressed, and disposed to sleep, but sensible; eyes natural.

16th.—Headach relieved; increasing oppression.

From that time there was partial stupor, with much talking, which was generally coherent. Pulse very variable; varying in a few minutes from 80 to 120. He died on the 22d, rather unexpectedly, without perfect coma. He had continued

to know those about him till 12 hours before his death. His sight continued natural, except on the last day of his life, when he appeared to be blind. There had been no paralytic symptom and no convulsive affection.

*Dissection.*—The right hemisphere of the brain, to about half its depth, was reduced to a mass of fetid pus. In the centre it was fluid, and towards the external parts of a pulpy consistence. In this mass there appeared some small coagula of blood, and all the ventricles contained a considerable quantity of bloody serum.

VII.—*The peculiar destruction of the central parts combined with suppuration.*

Case 9.—Mr D. aged 18, (July 10, 1815,) was affected with violent headach, extending along the upper and back parts of the head, and very severe in the neck, where it was much increased by the motion of the head. Much oppression; pulse natural; face rather pale; tongue clean; eyes natural. Had been ill three days; and the complaint had commenced with shivering; had been many years affected with deafness, and liable to suppuration of the ears.

The usual practice was employed, general and topical bloodletting, purging, blistering, &c.

The bleeding gave great relief at each repetition of it, and the blood was buffy, but the relief was transient. On the 13th he had squinting and double vision, which continued on the 14th, but then went off, and did not return. The headach continued, with many variations in degree; sometimes he made little complaint, at other times he was in violent pain. There was sometimes a degree of delirium, but it was slight and transient. There was much oppression, but no coma. He died on the 17th very suddenly. At my last visit he raised himself in bed with little assistance, answered questions distinctly and correctly, and knew every person about him; sight natural; pulse 60; died a few minutes after I had left the house.

*Dissection.*—The whole of the posterior part of the right hemisphere was one mass of undefined suppuration, and the fornix was broken down into a soft pulpy mass. There was considerable deposition of coagulable lymph on the surface of the brain in several places, especially under the anterior lobes. There was a very small quantity of fluid in the ventricles. There was in the substance of the brain, near its base, a small tumour of an ash colour, which contained a cheesy matter, approaching to suppuration. A portion of the dura mater covering the

temporal bone, behind the auditory portion, was thickened and spongy; and there was a slight appearance of caries in the portion of bone with which the diseased membrane was connected.

VIII.—*Suppuration with extravasated Blood.*

Case 10.—A man, aged 40, had complained for two months of frequent pain and throbbing of the left side of his head. In March 1814, he began to be affected with convulsive motions of the right arm and leg. These attacked him in paroxysms, which usually continued about a minute, leaving him in the intervals able for his usual employment. After blood-letting and purging, these paroxysms became less frequent, and after eight or ten days ceased. He was then affected with giddiness and confusion of thought, and a considerable torpor of the right side; after some time, this came to be attended with motions in the right arm and leg, exactly resembling those of chorea. The muscular power of these parts was at the same time diminished, and at the end of two months from the first appearance of the spasmodic affections, they became completely paralytic. His pulse had continued quite natural. His speech was then affected, being first inarticulate, and gradually lost, so that after the middle of June he never was able to articulate a word. About this time his pulse began, for the first time, to be a little frequent, and he passed his feces and urine involuntarily, but his mental faculties seemed to be entire. He took food when it was offered to him, and put out his tongue when desired. His eye was natural, and the expression of it intelligent. His sight and hearing appeared to be perfect, but he never attempted to speak. He often screamed as from pain, at the same time laying his hand on his forehead, and frequently shed tears. He continued in this state till the end of July, when he became comatose, and died in three days.

*Dissection.*—On removing the dura mater, the left hemisphere of the brain felt soft and fluctuating through its whole extent like a bag of fluid. On cutting into it, through about half an inch in thickness of sound cerebral substance, the remainder of the hemisphere was found nearly reduced to a bag of purulent matter; where it was not in this state, the cerebral substance was reduced to a soft pulpy mass. From this mass of disease, the ventricle was separated merely by the pia mater covering its inner surface, and it contained a very small quantity of serous fluid. In the substance of the left thalamus nervi optici, there was a coagulum of blood the size of a walnut.

## IX.—*Suppuration of the Cerebellum, combined with effusion in the Brain.*

Case 11.—Miss C. aged 18, on the 4th of March 1813, was seized with the ordinary symptoms of inflammation of the bowels. The inflammatory symptoms were subdued by two full bleedings, but the bowels continued very obstinate, and were not moved in a satisfactory manner till the 12th. During this period, a variety of purgatives had been given, with repeated injections of tobacco; and by calomel, given as a purgative, her mouth had been affected as early as the 7th.

From the beginning of the attack she had been affected with pain in the left ear, and, about the 7th, began to complain of headach. This was at first slight, and, amid the urgency of her other complaints, excited little attention. It increased, however, and on the 11th had become very violent. She then lay pressing her temples with her hands, and screaming from pain. The pulse at this time was natural; she was free from vomiting, and uneasiness of the bowels. On the 11th, there was a considerable discharge of matter from the left ear. On the 13th the pulse rose suddenly to 160, and there was such a degree of sinking as required the use of wine. The pulse soon subsided again, so that on the evening of the 14th it was at 80, and on the 15th at 60. The headach continued unabated. On the 14th there was a tendency to coma, which was increased on the 15th, with dilatation of the pupils. There was little room for active practice; topical bleeding, blistering, &c. were employed without relief. On the 16th, the pulse began to rise again, but was very variable, varying in the course of a few minutes from 80 to 120. She lay in a state of great oppression, but when roused, knew all those about her, and talked sensibly; headach still severe.

18th.—Lost the power of swallowing; often asked for drink, and was nearly suffocated in the attempt. Pulse from 90 to 150.

19th.—Squinting and dilated pupil. Pulse from 96 to 160.

20th.—Squinting increased; swallowed a little once or twice with an effort; at other times was nearly suffocated in attempting it; was still quite sensible when roused, and complained of violent headach. Sunk gradually, and died on the 22d. Continued sensible when roused, and knew those about her, till within an hour or two of her death. She also retained the sense of vision, though the pupils were much dilated.

*Dissection.*—The surface of the brain was natural: the substance shewed marks of increased vascularity, and the ventricles were distended with colourless fluid. The left lobe of the cerebellum was entirely converted into a bag of purulent matter, of

a greenish colour, and intolerable fetor. It was contained in a soft and organized sac, which appeared to have been recently formed. A portion of the dura mater, on the outer side of the abscess, was thickened, and spongy; the bone was sound. The caput coli, and about eighteen inches of the extremity of the ileum, were of a dark livid colour, but sound in their structure.

Case 12.—A girl, aged 9, was liable to attacks of suppuration of the ear, which were usually preceded by severe pain, and some fever. She suffered one of these attacks in the left ear in July 1810, in which she was not, as formerly, relieved by the discharge of matter, but continued to be affected with pain, which extended over the forehead. In consequence of this, I saw her, for the first time, on the day in which the discharge took place, and found her affected with pain across the forehead, impatience of light, and some vomiting; her look was oppressed; the pulse 84.

Blood-letting, purging, blistering, and mercury, were employed without relief.

On the 2d day the pulse was 60; on the 3d there was slight and transient delirium, a degree of stupor, and once slight convulsion. She complained once or twice of pain in the back of the head, but her chief complaint was always of the forehead. She lay constantly with both her hands pressed upon the forehead, and moaning with this pain, of which there had not been the least alleviation. 4th day, pulse from 80 to 86; no change in the symptoms; oppression, but no coma. 5th, Continued sensible, and died suddenly in the afternoon, without either squinting, blindness, or coma, and the pulse having continued under 90. The left ear had continued to discharge matter, and an opening had formed behind the external ear, from which also there was a purulent discharge.

*Dissection.*—A considerable quantity of colourless serum was found in the ventricles of the brain. The brain was in other respects healthy. In the left lobe of the cerebellum, there was an abscess of considerable extent, containing purulent matter of intolerable fetor. The dura mater, where it covered this part of the cerebellum, was thickened and spongy, and the bone corresponding to this portion was soft, and slightly carious on its inner surface, but there was no communication with the cavity of the ear. The opening behind the ear merely passed behind the external ear, and communicated with the external meatus.

X—*Deposition of new matter on the surface of the Brain.*

Case 13.—A boy, aged 11, had been for about a fortnight

remarkably listless and inactive, and affected with frequent vomiting. The vomiting had recurred every day, sometimes several times in the day; his bowels were costive, but he complained of no pain, and was free from fever. In the evening of 29th June 1816, he was seized with violent convulsion, which recurred repeatedly. In the intervals he had severe vomiting, and complained of headach. Pulse 60. The convulsion recurred frequently through the following night; in the intervals, he complained that he could not see. Towards the morning, the convulsion ceased, and left him in profound coma. The coma continued till mid-day on the 30th, when it began to abate, after he had been freely purged. In the evening he was quite sensible, and complained of headach. Pulse 120.

July 1st.—The ordinary round of practice having been adopted, he was much relieved; no headach; no vomiting; tongue moist. Pulse 120.

2d.—Pulse 108. No complaint; much disposed to sleep; pupils rather dilated.

3d.—Pulse 112. No complaint; appearance much improved; eye natural; bowels open; tongue clean; no unusual drowsiness.

4th.—Pulse 108. Functions natural; a good deal disposed to sleep.

5th.—Pulse 70; had an attack of vomiting, and complained violently of his head; afterwards sunk into a degree of stupor; was sensible when roused, but impatient of being disturbed; complained much of his head; eyes natural; repeated vomiting.

6th.—Perfect coma, with frequent convulsion; pulse from 120 to 160; he frequently lay with one hand pressing his forehead, and the other on the lower part of the occiput, as if he felt pain at both these places.

7th.—In profound coma the whole day. Died in the night.

*Dissection.*—On raising the dura mater, the surface of the brain had in many places the appearance as if purulent matter was confined under the arachnoid coat. On raising this membrane, however, the appearance was found not to be owing to pus, but to a layer of firm yellow substance which lay betwixt the arachnoid coat and the pia mater. It was in general of the thickness of a smooth shilling; some portions were thicker, and in some places masses of it of considerable thickness lay betwixt the convolutions. There was also a good deal of it between the hemispheres, which were partially glued together by it. The principal seats of this appearance were the anterior part of both hemispheres, the inferior surface of the brain, especially

in the depressions between the lobes, and nearly the whole surface of the cerebellum. On the posterior parts of the brain, where this membrane was wanting, the pia mater was evidently inflamed. The surface of the brain at these places had also an inflamed appearance, but it did not penetrate into its substance. The central parts were healthy; there was no effusion in the ventricles; some fluid was found in the base of the cranium after the brain was removed.

Case 14.—A girl, aged 9, awoke suddenly in the night of 20th September 1817, screaming with violent headach, and exclaiming, that some person had given her a blow on the head.

21st.—She complained of pain of the forehead; but she was not in bed, and the pain was not severe.

22d.—Little change; partly in bed, and complaining of headach, but the complaint excited no alarm.

23d.—Was seized with violent and long-continued convulsion, which was immediately succeeded by profound coma.

24th.—I saw her for the first time; found her in perfect coma; the eyelids open; the eyes distorted upwards; pulse natural. Continued in the same state on the 25th, and died on the 26th.

*Dissection.*—On removing the dura mater, the surface of the brain appeared highly vascular, as if inflamed, except where it was covered by a layer of solid matter, of a yellow colour, spread out betwixt the arachnoid membrane and the pia mater. This substance was distributed in irregular patches over various parts of the surface of the brain, but was most abundant on the upper part of the right hemisphere. There was also a considerable quantity of it on the surface of the cerebellum. It was in general of the thickness of an old shilling, and in some places it extended down betwixt the convolutions. There was considerable gelatinous effusion about the optic nerves, and about one ounce of colourless fluid in the ventricles. The substance of the brain throughout was unusually vascular.

XI.—*Deposition on the surface, combined with suppuration in the Ventricles.*

Case 15.—A child, aged 5 months, previously in perfect health, was seized with convulsion on the evening of 21st November 1817. The attack, which was not of long duration, was ascribed to dentition; the gums were divided over several teeth that appeared to be producing irritation, and the other remedies were recommended that are usual in such affections. He continued well through the night. On the 22d, was oppressed with

quick breathing, and in the afternoon, without any return of convulsion, he fell into a comatose state. This continued several hours, and then subsided, after bleeding with leeches on the temples, brisk purging, and the use of cold applications to the head. On the 23d he was much relieved; eye clear; took notice of objects, and was disposed to play: had no complaint, but occasional starting. On the 24th, continued through the day in the same favourable state. Late at night he was seized with convulsion, which continued to recur at short intervals through the whole night, and he died early in the morning.

*Dissection.*—On the surface of the brain, between the pia mater and the arachnoid membrane, there was an extensive layer of a firm adventitious membrane of a yellow colour, similar to that which has been described in the two preceding cases. It covered a great part of the upper surface of the brain, and there was a considerable quantity of it on the inferior surface of the anterior lobes, between the hemispheres, and on the cerebellum. In the lateral ventricles, there was nearly an ounce of purulent matter, and the substance of the brain surrounding the ventricles was very soft. There was no serous effusion. There was much gelatinous effusion about the optic nerves, under the base of the brain, and under the cerebellum. Under the medulla oblongata there was gelatinous effusion, mixed with some purulent matter.

### XII.—*Suppuration on the surface of the Brain.*

Case 16.—A child, aged eight months, died 13th March 1818, of an illness which had continued rather more than three weeks. It began with fever, restlessness, and quick breathing; afterwards, there were frequent slight convulsive affections, with much oppression, and at last severe convulsions, squinting, and coma. At an early period of the complaint, there was observed a remarkable fulness or prominence of the anterior fontanelle; towards the end of the second week, this increased considerably; in the third week it was elevated into a distinct circumscribed tumour, like the half of a large gooseberry. This tumour was on the middle of the fontanelle, and was soft and fluctuating; pressure upon it occasioned convulsion. It was opened by a small puncture, and discharged at first some purulent matter, afterwards bloody serum. No alteration took place in the symptoms, and the child died four days after.

*Dissection.*—The opening which had been made through the fontanelle was found to lead to a superficial deposition of thick flocculent yellow matter mixed with pus, under the dura mater, and covering the surface of the brain to a considerable extent. There was also a deposition of similar matter under the arach-

noid coat, and between the convolutions, about the optic nerves, and under the medulla oblongata. There was a good deal of fluid in the ventricles.

### XIII.—*Suppuration within the left Lateral Sinus.*

Case 17.—Miss S. aged 16, (3d August 1816,) complained of severe headach, which extended over the whole head; had an oppressed look, and great heaviness of the eyes; pulse 120; tongue clean and moist; face rather pale. She had been liable to suppuration of the ears; and the left ear had been discharging matter for three weeks; had complained of headach for a fortnight; confined to bed two days.

General bleeding, purging, and blistering were employed on the 3d and 4th with considerable temporary relief.

5th.—Headach easier; some vomiting, and several severe attacks of shivering; pulse 112.

6th.—Pulse 84; headach severe; now confined to the back part of the head; eye heavy; pupils a little dilated; bleeding from the temporal artery was employed, purging, an issue in the neck, &c.

7th.—Pulse in the morning 84, in the evening 120; headach as before; a dull vacant look; bowels very open; a buffy coat on the blood from the temporal artery.

8th, 9th.—Pulse rising, from 120 to 148. Severe pain of the back of the head and neck.

10th, 11th.—Pulse from 130 to 140; strength failing; a tendency to stupor, and occasional delirium; but was sensible when fully roused, and said she felt that she was at times delirious; constant complaint of pain in the back of the head.

12th.—More comatose, but sensible when roused; spoke sensibly, and knew those about her a few minutes before her death, which happened about mid-day.

*Dissection.*—The pia mater was highly vascular, as if minutely injected; in some places, especially on the posterior part, it was distinctly inflamed; the veins were very turgid, and at one place, on the posterior part, there was a slight appearance of extravasated blood under the pia mater; there was no serous effusion, and no disease in the substance of the brain; the left lateral sinus was remarkably diseased through its whole extent. When compressed it discharged purulent matter; and some thick cheesy matter; it contained no blood; its coats were much thickened, and its inner surface was dark coloured, irregular and fungous. At one place the cavity was nearly obliterated The disease extended into the Torcular Herophili, and affected a little the termination of the longitudinal sinus.

Behind the auditory portion of the temporal bone, near the foramen lacerum, and in the course of the left lateral sinus, a portion of the bone, nearly the size of a shilling, was dark-coloured and carious on the inner table. It was at this place that the sinus appeared to be most diseased. The auditory portion of the bone was extensively carious; the cells of it were every where full of purulent matter, and communicated freely with the cavity of the ear.

### XIV.—*Suppuration of the Brain, with remarkable disease of the Bones of the Cranium.*

Case 18.—A woman, aged 48, about a year before her death, fell down a stair, and received various injuries, especially one on the head, which confined her to bed for some days. From this time her health was bad. She generally complained of fixed pain of the head, and various disorders of the stomach and bowels. She, however, went about her usual employments till about three weeks before her death, when she was suddenly attacked with fever, and outrageous delirium. After a bleeding from the arm these symptoms subsided; next day she had extensive erysipelas of the face, which went off in a few days. She was then able to be out of bed, but complained of a fixed and deep-seated pain in the right side of the head, a little above the ear, and there was a discharge of matter from the right ear. She continued in this state, sitting up part of the day, till three days before her death, when she became comatose, with partial paralysis of the left side, and frequent convulsive agitation of the right arm. She died on the third day after the occurrence of these symptoms.

*Dissection.*—The cranium was very easily opened, the bones being remarkably soft. On raising the skull-cap, the inner surface of the whole upper part of the cranium exhibited a singular state of disease. The smooth surface of the inner table was wanting through its whole extent, and there appeared the rough, irregular, cancellated structure of the central part of the bone. Betwixt this surface and the dura mater, there was a soft adventitious membrane of a yellowish colour, varying from $\frac{1}{12}$ to $\frac{1}{8}$ of an inch in thickness. In raising the skull-cap, this membrane in some places adhered to the dura mater, leaving exposed the rough irregular surface of the bone, in other places it adhered to the bone, exposing the dura mater of its natural appearance. The parts affected by this disease were, the frontal bone above the orbitar plate, the whole of both parietal bones, the squamous portions of both temporal bones, and rather more than the upper half of the occipital bone.

The greatest erosion was on the parietal bones, where some portions were transparent, and at a few points eroded quite through. The external surface of the cranium was of a natural appearance, except at a few points where it was perforated by the erosion. In the lower part of the right hemisphere of the brain, towards the posterior part, there was an extensive abscess. The brain in other respects was healthy. On the petrous portion of the right temporal bone, the dura mater was of a dark colour, and detached from the bone, but the bone was not carious.

### XV.—*Abscess of the Medulla Oblongata.*

Case 19.—A child, aged 16 months, whom I saw only a week before his death, had been in a declining state for ten months. The beginning of his bad health was ascribed to a fall, in which he was supposed to have sustained an injury of the back of the head or neck. I could obtain no very distinct account of his illness. He was reported to have been often much oppressed, and gradually wasting. Three months before I saw him he had squinting, and appeared to lose the use of the right arm and leg. The squinting went off after some time, and afterwards recurred occasionally. The use of the arm and leg appeared never to have been entirely recovered; they always appeared much weaker than those of the other side, and he seldom attempted to raise the arm at all. He had also occasionally suffered slight convulsive affections. When I saw him, there was no marked symptom, except considerable emaciation; the pulse was frequent; the bowels were costive. Much dark-coloured matter being evacuated from his bowels, he seemed to be relieved. After some days I took notice of a remarkable slowness of the pulse, without any other symptom. In the course of that day, he was attacked with violent convulsion. This recurred several times during two days, and then proved fatal. There was no coma; the eyes continued sensible except during the convulsions, and he took notice of objects a very short time before his death.

*Dissection.*—There were several ounces of fluid in the ventricles of the brain, and considerable gelatinous effusion about the optic nerves. In the substance of the medulla oblongata, where it is crossed by the pons Varolii, there was an abscess which appeared to occupy the whole diameter of it. It had the appearance of a scrofulous abscess, and was contained in a sac, the inner surface of which was of a yellow colour and ulcerated. There was considerable disease in the glands of the mesentery.

## XVI.—*Remarkable thickening of the Dura Mater.*

Case 20.—Mr M. aged about 60, for about two years before his death, had been liable to attacks of giddiness, with loss of muscular power, in which, if not prevented, he would have fallen down. In these attacks he did not lose his recollection, and he recovered completely in a few minutes. Before the commencement of this complaint, he had been liable to severe headach, with some giddiness, the attacks of which generally went off with spontaneous vomiting. He was entire in his mind, but considerably fallen off in flesh and strength; he felt an unsteadiness in walking which made him afraid of walking alone; and for several months before his death, had perceived an increasing weakness in both lower extremities. On the 1st of August 1816, he was attacked with hemiplegia of the left side, accompanied by headach and giddiness. His pulse was natural, and his mind was not affected. For four days he continued to be affected with the most complete hemiplegia; he then began to recover a little motion of the parts; and about the 15th, was able to raise his arm to his head, and to walk a little with assistance; he still complained of giddiness and noise in his ears; but had little headach; bleeding and purgatives had been employed, with spare diet. On the 19th there was considerable headach. On the 20th he was incoherent; and on the 21st in perfect coma, with some convulsion. On the 22d, he was considerably recovered, so as to know those about him, and answer questions rationally; but at night relapsed into coma, and died on the 23d. For the last three days his pulse had been from 112 to 120.

*Dissection.*—Along the upper part of the right hemisphere of the brain, there lay a remarkable tumour $5\frac{1}{2}$ inches long, $2\frac{1}{2}$ broad at the broadest part, and about $\frac{1}{2}$ inch in thickness. It was formed by a separation of the laminæ of the dura mater, and a deposition of new matter betwixt them. This new matter was, at the posterior part, white and firm. In other places, chiefly about the centre of the tumour, it was more recent coagulable lymph, firm, yellow, and semitransparent; at the anterior part there was a cavity containing a yellowish serous fluid. This tumour lay from before backwards, along the right hemisphere; its inner edge was about an inch from the superior longitudinal sinus. The dura mater in the neighbourhood of the tumour all around, was considerably thickened, as were also the coats of the longitudinal sinus. The surface of the brain, where the tumour lay, was depressed by it so as to retain the impression of its figure; and on the anterior part, the sub-

stance of the brain was to a considerable depth soft, and broken down, with some appearance of suppuration. There was very little serous effusion, and no disease in any other part of the brain.

## Sect. III.—General Observations.

The painful detail of fatal cases which I have described in the preceding section, may be considered as illustrating the principal forms and terminations of chronic inflammation of the brain. Much remains to be done before we can obtain a complete acquaintance with this dangerous disease; but there are several principles, both pathological and practical, which appear to be legitimate conclusions from the cases that have been described. They may be referred to the following heads:—

### I.—*Varieties of Hydrocephalus.*

Of the cases which terminate by serous effusion, there appear to be two leading varieties, which differ remarkably from each other. In the one, the symptoms are at first slight, and excite no alarm; and it is only at an advanced period of the complaint, when it begins to pass into coma, that it assumes the character of a dangerous affection of the brain, (cases 2d and 3d.) In the other, the symptoms are from the first acute and violent, indicating an inflammatory action of the most dangerous kind, (cases 5th and 6th.) Betwixt these two forms of the disease, a remarkable difference occurs in the morbid appearances. In the former, there was serous effusion, without disease in the substance of the brain; in the latter, the effusion was combined with that peculiar destruction of the central parts of the brain, which I have given my reasons for considering as the effect of inflammation of these parts. In case 4th, this destruction of the central parts was the only morbid appearance, though the disease exhibited all the ordinary symptoms of hydrocephalus. Since I first began to pay attention to this appearance, I have generally found the serous effusion combined with it in those cases in which the symptoms were acute, and uncombined with it in those in which the symptoms were at first slight, and the progress slow and insidious, exciting little alarm till they began to shew a tendency to coma. Have we not, then, reason to believe, that, in these acute cases, the original disease is a deep-seated inflammation of the brain?—that this inflammation may give rise to serous effusion, or that it may run its course to a fatal termination without effusion? In our pathology of these affections, do we not attach too much importance to the effusion, ascribing

to it symptoms which we have reason to believe may exist without it, and directing much of our practice to promoting its absorption, while, even if we could rely upon this effect being produced, the original and fatal disease would remain unchanged? These remarks I merely offer, at present, as hints for farther observation. The subject is too important to admit of any general conclusions from the experience of an individual.

The other form of the disease, in which there are no symptoms of an acute or inflammatory nature, and in which the first indication of danger is from the appearance of coma, appears to differ materially from the acute form which I have just alluded to. The cause of the effusion in these cases is very obscure, and perhaps it has been too little the subject of investigation. On opening the cranium, and finding the ventricles of the brain distended with serum, we are too apt to conclude the examination, and to consider the disease as accounted for. We are not thus satisfied in other parts of the body. On finding effusion in the thorax or abdomen, we do not consider it as a primary disease, but proceed to investigate its origin, and we are generally able to trace it to an affection of some of the viscera, as the liver, the lungs, or the heart. We have as little reason for considering it as a primary disease in the brain, though we have not been so successful in tracing its origin. There is, besides, considerable ground for doubting whether the mere effusion be the cause of the symptoms which usually accompany it. Morgagni mentions a man who had an attack of hemiplegia, and completely recovered from it: after two years he died suddenly, from suffocation, in the advanced stage of pneumonia, having never, since his former illness, shewn any symptom in the head, except occasional headach. On dissection, eight ounces of fluid were found in the ventricles of the brain. Dr Heberden describes the case of a man, in whom he found, on dissection, about eight ounces of fluid in the ventricles, besides a considerable quantity under the arachnoid coat. He died suddenly, after being weakened by a febrile attack, but without any symptom that indicated disease in the brain. * From such cases as these, many of which are on record, may we not conjecture, that effusion in the brain does not necessarily produce urgent symptoms, and that the coma and other symptoms which attend the ordinary cases of hydrocephalus, are the result of the morbid condition of the brain, which produces the effusion, and not the immediate effect

---

* Medical Transactions of the College of Physicians of London, Vol. V.

of the effusion itself? This morbid condition, we have reason to believe, is in one form of the disease chronic inflammation, and we have accordingly seen it accompanied by coma, and the other usual symptoms of hydrocephalus, without having induced effusion. What is the nature of it in the other cases which have not an inflammatory character, is involved in much obscurity. Among the most common causes of serous effusion, in other parts of the body, are circumstances that impede the transmission of the venous blood. In this manner ascites is produced by induration of the liver, and general dropsy by diseases of the lungs and of the heart. In the ventricles of the brain, there is much reason to believe that the effusion takes place from the vessels of the choroid plexus. We see the cellular texture of this substance elevated by it into vesicles resembling hydatids; and in a case by Mr Howship, in which the effusion had a highly inflammatory character, he found the choroid plexus covered with flocculi of coagulable lymph, giving considerable reason to believe, that it had been the source of the effusion. Now, the blood returning from the choroid plexus, as well as from the lining of the ventricles, passes into the straight sinus by the vena Galeni; and this large vessel is, perhaps, more exposed to compression than any of the other veins of the brain; the branches which form it unite in the velum interpositum, which lies under the fornix, and the trunk of the vein is found passing backwards betwixt the corpora quadrigemina and the posterior part of the corpus callosum. We cannot doubt that these parts are liable to diseases both acute and chronic; but the nature of them has not been sufficiently investigated, nor the effect that they would be likely to produce on the circulation of the vena Galeni. I think, however, we may conclude, upon the most fair and sound analogy, that any considerable interruption to the circulation in that vein, would give rise to effusion in the ventricles. Perhaps there are other causes which may operate in the same manner, such as disease of the sinuses, producing diminution of their area. On these important points much remains to be done by accurate observation.

### II.—*Suppuration of the Brain.*

Four varieties occur in the form of suppuration, and they appear to differ considerably in their symptoms. (1.) An extensive portion of the brain, often the greater part of one hemisphere, broken down into a soft mass, in which purulent matter is mixed with soft corrupted cerebral substance, perhaps with some pure pus in the centre. (2.) A distinct abscess confined within a soft cyst, the surrounding cerebral substance be-

ing healthy. (3.) Purulent matter on the surface, either betwixt the membranes, or under the pia mater, or both. (4.) Superficial ulceration of the surface of the brain.

1. The first form seems to constitute the *sphacelismus cerebri* of systematic writers, and is exemplified in cases 8th and 9th. The symptoms do not differ materially from those of hydrocephalus, except that there is less coma. This was very remarkable in case 9th, in which the patient was, with the exception of a great degree of deafness, in possession of every faculty a very few minutes before death. After the first, or active stage, is over, the patient generally lies in a state of great oppression, often with incoherent talking, but out of which he can be roused, so as to answer questions distinctly. In both the cases that I have described, shivering occurred at an early period. In one of them there was double vision for one day, which then disappeared, and vision continued natural to the last; in the other there was blindness on the last day. I have not observed either convulsion or paralysis in this form of the disease, except in the remarkable case (case 10th) in which it was complicated with extravasation of blood.

2. The encysted abscess.—In this case, the matter is contained in a defined cavity, which is generally lined by a soft white sac, formed, probably, by effused coagulable lymph. The cerebral substance in the vicinity is little injured. In cases of this kind convulsive and paralytic affections are more apt to occur than in the former. The course of symptoms in case 7th was very remarkable. The sudden attack of convulsion, followed by paralysis of one arm, probably occurred in the inflammatory stage, for, when the symptoms were relieved by the bleeding and other remedies, the arm recovered its motion; the convulsion returned, and the paralysis along with it, and, after several attacks of the same kind, the paralysis became permanent. The thigh and leg then went through the same course. Circumstances will be afterwards mentioned which render it probable, that, in cases of this kind, convulsions occur while the inflammatory state is going on, and that the period of suppuration is indicated by the permanent paralysis. In this case three abscesses were met with, but whether the successive formation of these had any relation to the successive attacks of the disease in the arm and leg, must be matter of conjecture. In a similar case, related by Bartholinus, the leg was first affected, and afterwards the arm. One abscess only is mentioned, of which it is merely stated, that it was on the opposite side. In a case related by Schenkius, there occurred paralysis of the left side and convulsion of the right; there was a superficial abscess on the

right side of the brain, and the membranes covering that part were very dark coloured, and much loaded with blood. Something similar to this occurred in case 18th, in which there was paralysis of the left side, with convulsive agitation of the right arm. In a girl, aged 5, whose case is described by Dr Bateman, * an abscess, containing ℥iv. of pus, inclosed in a firm vascular sac, was found in the posterior part of the right hemisphere. She was first affected with convulsion of the whole body, which continued nearly two days. During this time the left side was in a state of rigid contraction, and the right was in constant motion. When the attack subsided, the left side remained paralytic. She then had headach, squinting, blindness, and repeated convulsion, and died after an illness of eleven weeks, having been comatose only for one day before her death. In some cases of this kind, paralysis has occurred without convulsion, and in others convulsion without paralysis; but some affection of one or other kind has occurred in nearly all the cases of encysted abscess that are on record. In a case described by Morgagni, the prominent symptoms were pain of the left side of the head, delirium, loss of speech, and weakness of the muscles of the left side of the neck. The man died in fourteen days, gradually exhausted, and an abscess was found in the right corpus striatum, which had burst into the ventricle. In a case mentioned by Valsalva, in which the disease was in the corpus striatum, the speech was much affected, and one side was paralytic. In another, there was indistinctness of speech, and paralysis of the right side, connected with an ulcerated cavity in the base of the brain, on the left side. In a third case, by the same writer, there was paralysis of the right side, and convulsion of the left, with an ulcerated cavity in the substance of the brain, under the choroid plexus of the left side. From these observations, it appears that convulsion is apt to occur on the same side with the disease in the brain, and paralysis on the opposite side, and that convulsion may occur in either, or in both. In a few cases, abscess has been found in the brain without any symptoms that had indicated its existence. Morgagni found one in the posterior part of the brain, in a man who died of gangrene of the nates, without any symptom in the head. A man mentioned by Dr Powell, † was received into Bartholomew's Hospital on account of cough, dyspnœa, and bloody expectoration. He died after being a month in the hospital, having been for some

---

* Edinburgh Medical Journal, Vol. I. p. 150.

† Medical Trans. of the College of Physicians of London, Vol. V.

time before death in a dosing state, with occasional delirium, but without coma, and he had never complained of his head. His lungs were much diseased, and an abscess, the size of a large walnut, was found in the substance of the brain, under the anterior part of the corpus callosum.

These observations apply chiefly to the more acute form of the disease, in which it approaches to the nature of active inflammation of a part of the brain, terminating, in a short time, by the encysted abscess. But it occurs in a more chronic form, producing its symptoms for a much longer time, often for several months, and then proving fatal, generally by suppuration, but sometimes without having suppurated. When the disease, in these cases, proves fatal without suppuration, a part of the brain is found changed in its structure, generally of a reddish colour, and in consistence resembling a steatomatous tumour. The portion so changed is usually small and circumscribed, and it is sometimes surrounded by a sac, which is soft, and of recent formation. This appearance has been called a tumour in the brain. I believe that it is merely a part of the brain in the state of scrofulous inflammation; that, in its early stage, it is a disease which may be cured; and that the formation of a sac of coagulable lymph around it, is the first point in its progress which gives it the character of organic, or hopeless disease. In this state it may be fatal, or, being drawn out to a greater length, it may go on to partial or complete suppuration. This affection, in its first stage, was observed by Burserius * in the anterior part of the right hemisphere, in a man who died after an illness of four months; he had been affected with constant pain of the head, near the vertex, fever, paralysis of the left side, and convulsive affections, which occurred at intervals; his lungs also were ulcerated. Fantonus † found a similar disease in the corpus callosum in a man who had been long affected with intense pain in the crown of the head, with epileptic paroxysms, and at last died comatose and convulsed. This man was affected with inordinate hunger, and an acrid state of the saliva. In the state of suppuration, Burserius found one the size of a pigeon's egg, in the outer part of the right hemisphere, under the squamous suture, in a man who had been affected, for several months, with intense headach, and convulsive tremors of the whole body, which were most severe in the left side. He found another in the posterior part of the brain, near the tento-

---

* Burserii, Instit. Med. Pract. Vol. III.

† Fantoni, Epist. de Observat. Med. et Anat. Epist. V.

rium, in a woman, who had been ill, for several months, with severe headach, without fever: the pain was so intense as almost entirely to deprive her of sleep, and she seems to have been gradually worn out by the severity of it, without any other remarkable symptom.

This form of chronic inflammation of a small part of the brain is a disease of much importance. The symptoms may go on for several months, so as to assume the characters of organic disease; they may remit so as to resemble periodical headach; the disease may then be fatal, often unexpectedly; or after it has appeared to resist all our remedies, it may gradually subside. This agrees exactly with the course of chronic inflammation, which we observe in external parts; we see it in the eye, in the lymphatic glands, in the mamma, in the testicle, and in the cellular membrane. It takes place rapidly, producing enlargement of the parts, and derangement of their functions; it may continue stationary for a considerable time; it may then terminate in unhealthy suppuration and ulceration, or in permanent induration of the part; or, after resisting for a long time all our remedies, it may gradually subside, without leaving any permanent injury in the organization of the part. I think we have good reason to believe, that something similar to this takes place in the brain, and, if this doctrine be admitted, the practical importance of it will be, that we shall be less disposed than we usually are to consider sush cases as depending upon organic disease, and, consequently, not the objects of active practice. The two following cases so much resembled one another in their leading symptoms, that I think it fair and reasonable to consider them as examples of the same disease.

A gentleman, mentioned by Dr Powel, was affected with severe headach, which occurred in paroxyms: during the paroxysms, which often continued for several hours, he had double vision, impatience of light, and at one time muscular twitches, and numbness of the left side. The pulse was variable, sometimes a little frequent, sometimes rather below the natural standard. After large and repeated blood-letting, purging, blistering, &c. he was much relieved, but after a short interval of relief, the complaint returned with great violence, and required a repetition of the same remedies. After several aggravations and remissions of this kind, he had at the end of three weeks an interval of ease for more than a fortnight. The pain then returned with violence, and was accompanied by spasmodic affections of the muscles of the neck. He then derived temporary relief from narcotics, and, soon after this, the complaint assumed so much of a periodical character, that it was treated by cin-

chona: the pulse at this time was natural. Under this treatment, the paroxysms became rather less severe, but not less frequent, and they were attended occasionally by convulsive motions, which chiefly affected the right side. The paroxysms were very uncertain in their recurrence; sometimes they consisted of pain only, and sometimes accompanied by those convulsive motions. He died suddenly in a convulsive attack, two months after the commencement of the complaint: for some time he had been considered as better, and sat up for two hours on that day, in the night of which he died. The anterior part of the right hemisphere was found changed in its structure, and rather indurated, and the surrounding medullary substance was softened. When the dura mater was first removed, the part where the disease was situated appeared to rise higher than the neighbouring parts. There was a table spoonful of fluid in the ventricles; the other parts were sound.

A young lady, aged 22, was taken ill on the 20th of February 1817, and, for the first week, her complaint had the appearance of continued fever. In the second week, the pulse came down, and the tongue became clean and moist, while the headach continued severe, with a sense of weight, much throbbing in the head, a look of great oppression, and occasional vomiting. Blood-letting, purgatives, blistering, and the application of cold, afforded partial relief; but, on the 5th of March, the pain returned with great severity, accompanied by violent throbbing, and a degree of squinting. The same remedies again procured an interval of partial relief: The pain was not removed, but it was less severe than in the violent paroxysms; there was constant throbbing in the head, and a look of much oppression; the pulse was generally from 84 to 90. On the 11th, there was a violent paroxysm, followed by convulsion. She was again relieved by bleeding; but, on the 15th, she had loss of recollection, much confusion of thought, difficulty of articulation, and numbness of the right arm, and right side of the face: this was greatest in the face, which had no feeling when it was touched. These symptoms disappeared on the following day. The pain continued to recur in paroxysms, and, about the 24th, had assumed so much of a periodical character, that, by the advice of an eminent physician, it was treated by arsenic. This remedy having occasioned nausea, was given up after a week. She then continued for a fortnight or more, in nearly the same state, constantly confined to bed, and affected with frequent returns of the pain, but without any violent attack, until the 20th of April, when it returned with great violence, accompanied by vomiting, pain in the abdomen, and double vision during the paroxysm; the pulse at this time

was natural. The same remedies again afforded relief. From the beginning of May, the complaint began to diminish in violence. On the 20th, she was for the first time able to be out of bed; and from that time recovered gradually. Soon after her recovery, a large glandular swelling appeared upon her neck, which has continued stationary through the winter. She is still liable to headach, and throbbing in the head, and requires great care, and the most cautious regimen.

These two cases I am disposed to consider as examples of chronic inflammation of the brain, under that form in which its progress is most slow; in the one, terminating by fatal induration of a part of the brain; in the other by recovery, after an illness of three months. Upon the whole, I think we have ground for forming the following conjectures on this most important subject. 1. That chronic inflammation of the brain exists in various degrees of activity. 2. That in one form, probably the most active, it advances speedily to suppuration. 3. That in another form, probably the least active, its progress is slow; that it leads to certain changes in the structure of the part affected; that, at a certain stage in its progress, there is often formed round it a sac of coagulable lymph; and that the disorder then assumes the character of organic, or hopeless disease; that it may then go on to suppuration, forming an encysted abscess, or that it may be fatal without the formation of this cyst, and without suppuration. 4. That the disease may exist a long time in its first stage, producing urgent symptoms, but without advancing beyond that stage in which there is a chance of recovery. 5. That, though the complaint may not be much under the power of our remedies, it is not on that account to be considered as not being the subject of practice, but that vigorous treatment, by restraining its action, may perhaps prevent it from passing into organic disease, and afford at least the chance of gradual recovery.

In the encysted abscess of the cerebellum, convulsions and paralysis are rare: a very slight convulsive affection occurred once in case 12th. In case 11th, the most remarkable symptom was the loss of the power of swallowing. Many cases of abscess of the cerebellum are on record: I do not find that either convulsion or paralysis occurred in any of them, except in one case by Plancus, in which there was paralysis of one side, and it was in the same side with the disease.* In case 12th, though the disease was in the cerebellum, the principal seat of the pain was in

---

* Plancus, Storia Medica d'una Postema del lobo destro del cervelletto.

the forehead, and this has been observed in other cases of the same kind.

Inflammation of the cerebellum, like that of the brain, may also exist in a less active form, in which its progress is very slow. The symptoms in these cases are much less marked than those attending similar disease in the brain; and it appears, that it may even go on to suppuration without producing any very urgent symptom. A man, mentioned by Dr Douglas, had been for three months affected with pain in the forehead, which generally obliged him to sit with his head leaning forward; he had bad appetite, and disturbed sleep, but no other symptom. He died suddenly in an attack resembling syncope, having been for a day much better, with good appetite, and quiet sleep. An encysted abscess was found in the middle of the cerebellum, and a rupture of the left lateral sinus, which probably was the immediate cause of death. *

3. SUPPURATION ON THE SURFACE OF THE BRAIN may take place under the dura mater, or under the pia mater, or in both these situations. In these cases, it is probable that the matter is formed by inflammation of the membranes, for I think there is no doubt, that, in a certain state of inflammation, serous membranes are capable of forming pus. It is not, indeed, an uniform purulent matter like that which is formed in a healthy abscess, but a mixed matter, composed of yellow flocculi of coagulable lymph, combined with a thin puriform fluid. This is the appearance of the matter which is usually met with under the dura mater. The symptoms accompanying this affection vary considerably in different cases. There is pain corresponding to the part affected, sometimes with convulsive motions, and often ending in coma, but sometimes the patient dies suddenly without coma. In case 16th, a superficial suppuration of this kind elevated the fontanelle into a tumour, which was opened without relief, the greater part of the matter being of that thick flocculent kind that could not be evacuated.

A frequent and insidious form of this affection begins with pain in the ear, and may be for some time considered merely as an affection of that organ. Sometimes discharge of matter takes place from the ear, which occurrence is considered as confirming this opinion of the seat of the disease. The suppuration is expected to relieve the pain, but the pain continues, perhaps becomes more violent. The patient is oppressed and drowsy, then slightly delirious, and at last comatose. In other cases there is no discharge of matter; the patient, after complaining

* Edinburgh Medical Essays and Observations, Vol. VI.

for a short time, perhaps one day, of deep-seated pain in the ear, becomes restless and forgetful; lies rolling his head from side to side, or tossing about his arms, and in a short time sinks into coma. The pulse is in some cases frequent, in others natural, and in others below the natural standard, especially after the appearance of coma. The nature of these cases is illustrated by dissection. There is generally caries of the pars petrosa where it forms the ear, sometimes confined to a small spot of it; a portion of the dura mater corresponding to this part is thickened, spongy, or ulcerated, and generally detached from the bone; between this and the brain, there is either a collection of matter, or a deposition of coagulable lymph. Sometimes there is at that part a superficial abscess in the substance of the brain, and, in some cases, there are marks of more extensive disease, with effusion in the ventricles. In a boy, whose case is related by Mr Brodie, there was, in the left hemisphere of the brain, a cyst about three inches in diameter, of a pulpy consistence, thick and vascular, and containing a thick dark-coloured pus. The lower part of the cyst rested upon the petrous portion of the temporal bone. There was a small opening through the cyst, dura mater, and bone, forming a communication between the cavity of the cyst and the meatus auditorius externus. *

This affection appears, in many cases, really to begin in the deep-seated parts of the ear; thence the inflaminatory action spreads to the pars petrosa, speedily followed by caries, then to the dura mater, and at last to the brain. It occurs most frequently in persons who have shewn a tendency to disease in those parts, as in those who have been liable to suppuration of the ear, or to deep-seated suppuration behind the ear. A very unmanageable abscess is often met with in this situation, from which a probe can be passed to a great depth into the cells of the mastoid process. It is generally a scrofulous affection, extremely tedious in its progress, and sometimes terminates in the manner just alluded to, by inflammation spreading to the dura mater and inducing coma.

The matter which is formed in those cases, whether in the substance of the brain or betwixt the membranes. sometimes finds a vent by the ear, the dura mater being ulcerated, and the bone perforated by the caries. In this way very alarming symptoms are sometimes unexpectedly relieved. A young lady

---

* Transactions of a Society for the Improvement of Medical and Surgical Knowledge, Vol. III.

in Edinburgh had lain for three or four days in a state of perfect coma, and was considered as being in a hopeless condition; her medical attendants, paying their visits regularly as a matter of form, were surprised to find her one day sitting up and free from complaint. A copious discharge of matter had taken place from the ear, with complete relief, and she continued well. In other cases of this kind, the relief is but temporary; the patient continues liable to frequent attacks of headach, followed by discharges from the ear, and at last dies comatose. In some of these cases there is good ground for believing, that a communication had existed for a considerable time, perhaps for weeks or months, betwixt the ear, and a diseased surface within the cranium, and that the discharge which was thus afforded to the matter from time to time, had retarded the fatal event. Many cases are on record which render it certain, that, when there is an outlet for the matter, repeated suppurations may take place in this manner in the substance of the brain or on its surface, and the disease go on for a considerable time before it is fatal; and some of them have even at last terminated favourably. They are, however, generally fatal; in some the fatal event is sudden, like an apoplectic attack; in others there is a gradual abolition of the faculties, with constant complaint of the head, often accompanied by paralytic symptoms, or remarkable tremors of particular limbs, or with general convulsions.

It remains to be mentioned, that this form of the disease may run its course without inducing coma, and unaccompanied by any symptom that distinctly points out the highly dangerous disease which is going on within. A young man, aged 16, whose case is related by Dr Powel, * had been liable to suppuration of the ear and deafness. He was seized with a deep-seated pain in the right ear, without fever; some discharge of matter took place from it without relief. Temporary relief was obtained from opiates, but the pain always recurred with increasing severity. The discharge became fetid, but the pulse continued natural, and no other function was affected. On the 7th day of the disease, after a paroxysm of pain more violent than any of the preceding, he sunk rapidly and died. On dissection, part of the pars petrosa was found carious, black, and crumbling, and contained in its substance fetid pus. The dura mater corresponding to it was black, sloughy, and separated from the bone. Under the dura mater there was a collection of purulent matter and coagulable lymph, amounting to several ounces.

* Transactions of the College of Physicians of London, Vol. V.

It covered a great part of the surface of the right hemisphere, and a considerable quantity of it lay betwixt the posterior lobe and the tentorium.

Mr Parkinson * mentions a boy of 14, who had been affected for two months with headach and discharge of matter from the right ear. A week before his death the pain increased, and was accompanied by great debility and exhaustion, giddiness, and some vomiting. He continued in this state, without stupor or any other remarkable symptom, until the day on which he died, when he was suddenly seized with convulsion, and died comatose. An abscess was found in the middle lobe of the right hemisphere of the brain, and another in the cerebellum. There was extensive caries of the pars petrosa of the temporal bone, and effusion in the ventricles to the extent of three ounces.

Persons who have been long subject to suppuration of the ears are particularly liable to this disease. In many cases there is no immediate connection betwixt the disease in the ear and the internal disease, except that the former marks the tendency to chronic inflammation. In these cases the bone is not affected, and the internal disease may be seated in the cerebellum, or on the opposite side of the brain. I have, in a former paper, described a remarkable case, which began with suppuration of the ear, and terminated by suppuration of the spinal cord. In some cases, again, the attack of internal disease is preceded by a sudden cessation of the discharge from the ear. In such cases it is probable that the cessation of the discharge is not to be considered as the cause of the internal disease, as has sometimes been imagined, but as an effect of the inflammatory action changing its seat.

A similar disease is sometimes met with in the nose. A person who has been liable to pain in the forehead and discharge of matter from the nose, frequently accompanied by exfoliations of small pieces of bone, becomes at last forgetful and delirious, and dies comatose. The ethmoid bone is found carious, the dura mater corresponding to it is diseased, and there is a collection of pus between it and the brain, sometimes suppuration of the brain itself. Several cases of this kind are related by Lieutaud and Bonetus. Morgagni mentions a priest who, after being affected with fever, delirium, pain of the forehead, and convulsion, fell into coma, from which he was relieved on the 21st day of the disease, by a discharge of purulent matter from the nose. A case exactly similar, in a girl of 14, is related by Man-

---

* London Medical Repository for March 1817.

getus. We are not, however, warranted to conclude, that, in these cases, the discharge was from the cavity of the cranium; as violent symptoms, such as those now mentioned, have often been known to accompany suppuration in the frontal sinus.

Caries of the bone, connected with internal suppuration, may take place, in the same manner, in any part of the cranium without external injury. Some years ago, a remarkable case of this kind occurred in Edinburgh, in a middle aged man, who, after a short illness, died in a state of coma. In opening his head a collection of matter was found under the temporal muscle, which communicated through a carious perforation of the temporal bone, with an abscess in the substance of the brain. Burserius mentions a woman who, after suffering for a fortnight severe pain in the left side of the head, was seized with swelling and inflammation of the left eye-lids, eye-brow, and cheek; after several days this swelling suppurated and discharged much matter, and the left eye was found to be blind. After some days she was seized with convulsion, followed by coma, and death. On dissection, the external suppuration was found to have penetrated to the bottom of the orbit, betwixt the bone and the ball of the eye, without injuring the ball itself. There was extensive suppuration of the anterior part of the left hemisphere of the brain, which communicated freely with the cavity of the orbit.

The practical inference from these facts is, that deep-seated pain in the ear is to be regarded as an affection which should be watched with attention. If accompanied with fever and pain extending over the side of the head, it should be treated with activity; if there occur forgetfulness or delirium, the danger is urgent; if it pass into coma, it is probably hopeless. The same observation applies to ulcers on any part of the cranium which lead to denuded or carious bone, or from which a probe can be passed into the cellular structure about the base of the cranium. In some cases of this kind, the trephine has been applied with success; and they have shewn us what extent of disease within the cranium may be recovered from when a free outlet is procured for the matter. Morand * relates the case of a monk who had been for some time affected with discharge of matter from the right ear, and violent pain of the ear, extending over the right side of the head. A tumour formed behind the ear, extending upwards towards the temple, which, being opened, was found to be an abscess, and a probe could be passed from it through a carious opening in the cranium.

---

* Morand, Opuscules de Chirurgie.

The trephine was applied at that place, and discovered a suppurating cavity within the cranium, which discharged at each dressing a tea-cupful of matter. The discharge diminished gradually, and the sore was healed in two months. The man continued well four years after, when his case was laid before the French Academy.

4. SUPERFICIAL ULCERATION OF THE BRAIN.—When the disease affects the surface of the brain, the symptoms are, in some respects, different from those which occur in the other forms of the disease. A variety of singular spasmodic affections are among the most remarkable symptoms. In some cases they resemble chorea, but generally terminate in paralysis. A man, mentioned by Dr Powel,* was affected with a convulsive motion of the left side of his body, which very much resembled chorea; he was free from it during sleep, and had no other complaint. This affection continued six weeks, and then suddenly terminated in paralysis of the affected side. Soon after this his right hand and arm became convulsed, but in a slighter degree; he then became gradually comatose, and died two months after the commencement of the complaint. On the anterior part of the right hemisphere of the brain, there was a superficial loss of substance from ulceration, two inches in length and about an inch in breadth. It presented an irregular excavated appearance, and a thin layer of curdled matter was deposited in it. There was a similar disease, but much less extensive, on the anterior part of the left hemisphere. There was much fluid in the ventricles. A lady, mentioned by Dr Thomas Anderson,† had been for several years liable to pain in the head, which was most violent at a particular spot near the centre of the vertex. After she had suffered for a considerable time from this pain, she was seized with a convulsive affection of the left arm and leg. It occurred in paroxysms, attacked her several times every day, and generally continued about half an hour at each time. This complaint became gradually more and more severe; the right side became slightly affected in the same manner, and she afterwards became liable to attacks of coma, in which she often lay for 24 hours at a time. She died at last of gradual exhaustion. On the upper part of the right hemisphere of the brain there was a superficial loss of substance from ulceration, two and a

---

* Transactions of the College of Physicians of London, Vol. V.
† Transactions of the Royal Society of Edinburgh, Vol. II.

half inches long, one and a half broad, and about half an inch in depth. In the bottom of it there were found some thin laminæ of firm brownish matter, which crumbled into sand when they were rubbed between the fingers.

In cases of this kind, there is reason to believe that the ulceration takes place but a short time before death. The original disease appears to be chronic inflammation, which may either pass into ulceration in a short time, or may induce induration of the part. This induration may then continue for a long time, inducing urgent symptoms, and is often, at last, fatal by suppuration, or may be fatal without suppurating. This state of disease has accordingly been observed in various stages of its progress. A man, mentioned by Dr Anderson, received a violent blow on the back of his head, from the boom of a ship, which fell upon him as he was stooping under it. After some time he had pain in the part, which became gradually more severe, and, after eighteen months, brought on convulsive paroxysms of both upper and lower extremities, the violence of which put an end to his life, after he had suffered from them for several months. Both hemispheres of the brain, on the posterior part, were found inflamed, and much hardened. The diseased parts adhered closely to the dura mater, and to the falx; the dura mater, at that part, was also thickened and indurated. A man, aged 45, mentioned by the same writer, had been for several years liable to convulsive paroxysms, resembling epilepsy, but with this peculiarity, that the convulsion was confined to the right arm and leg. The attacks occurred at irregular periods, generally once in three or four weeks, and were succeeded by stupor, which continued about half an hour. Without any change in the complaint, he died suddenly, from an injury of the head. A portion of the upper part of the left hemisphere of the brain was found indurated, and closely adhering to the dura mater, which was at that place much thickened and hardened. Extravasated blood was found in another part of the head, which appeared to have been the effect of the injury, and the immediate cause of death. In a man, aged 35, who had suffered, for several years, from violent pain in the forehead, with epileptic paroxysms, Morgagni found the anterior part of the right hemisphere of the brain indurated, and adhering to the dura mater. Baaderus relates the case of a man, aged 40, who became suddenly epileptic, with pain at a particular spot on the left side of his head. There was an exquisite sensibility of the surface of the left hand and arm, so that the slightest breath of cold air upon them brought on convulsive twitches. After an illness of five years, he died rather suddenly. At the part which had

been the seat of the pain, there was a superficial induration of a portion of the brain, and under the indurated part there was an abscess the size of an egg.

The effect of superficial inflammation of the brain, and its membranes, is illustrated by a case related by Dr Anderson, where the disease took place under his eye. A boy suffered, from an injury of the head, the depression of a considerable portion of the right parietal bone, the depressed portion being forced through the dura mater, and driven inwards upon the brain. He had paralysis of the left side, and the left eye was insensible. The depressed portion being removed, the paralysis was greatly diminished, and the eye recovered a considerable degree of vision. On the third day after the operation, the wound in the dura mater was inflamed, with considerable tumefaction, and immediately the left leg and arm became convulsed, the convulsion being followed by paralysis. The left eye also became again insensible. He had frequent convulsion of those parts, the right side not being in the least affected, for several days, when, suppuration having taken place, all the symptoms subsided. Had this disease taken place, without such an outlet as was in this case afforded to the matter, the suppuration, instead of relieving the symptoms, would probably have induced permanent paralysis and fatal coma. A man, mentioned by Mr John Bell, suffered, from an injury of the head, extensive extravasation of blood on the surface of the brain, which was removed by repeated applications of the trephine. During the cure, which occupied three months, the left side of his brain suppurated five or six times. The attack of inflammation was always accompanied by fever, stupor, and difficult deglutition : These symptoms were removed by the suppuration. These attacks occurred at various parts of the brain. When they were towards the anterior part, he had double vision, which also was removed by the suppuration. When they were towards the posterior part, there was no double vision, but a state of vision in which a candle was seen with a halo round it.

Inflammation affecting the surface of the brain, may either be of that chronic kind, which, after some time, induces induration or superficial ulceration, or it may occur under a more active form, which is speedily fatal. An example of this, in which the disease was fatal in the inflammatory stage, occurs in case 1. An example of it in a more advanced stage is related by Burserius. A girl, aged 16, was affected with acute headach, fever, and vomiting; then became convulsed and comatose, and died on the sixth day. On the upper part of the brain, the cortical substance was corrupted and putrid, and of a leaden colour,

without suppuration. There was no effusion in the ventricles, and the other parts of the brain were healthy.

### III.—*Disease of the Membranes.*

Cases 13, 14, and 15, seem to be examples of extensive inflammation of the pia mater, the pseudo-membranous deposition being evidently the exudation from an inflamed surface. They were all characterized by severe convulsions, terminating in coma, in one preceded by a sudden attack of headach, in another by vomiting. Case 13 is remarkable, from the long and deceitful interval of apparent recovery, which preceded the fatal attack. Case 15, in which there was purulent matter in the ventricles, seems to have been fatal by the convulsion, without continued coma. In cases 13 and 14, there was deep and continued coma, though in the former there was no effusion in the ventricles, and in the latter but a small quantity. The convulsive affections which attack children, and which are apt to be indiscriminately ascribed to dentition, are, I think, in some cases connected with inflammation of the pia mater. In such cases, instead of the membranous deposition which occurred in these examples, we sometimes observe a thin but extensive coating of a puriform fluid on the surface of the pia mater.

The appearance described in the above cases seems to be rather uncommon. I have only found one example of it in Morgagni. It occurred after an injury of the head, and he describes it as a pseudo-membrane, resembling that which is found upon the pleura after pneumonia. Several cases are described by Fantonus, Willis, Haller, and Bonetus, in which the most remarkable appearance was inflammation of the pia mater, but without exudation. In a case by Haller, it was of a dark red colour, (colore atro-rubro); and in one by Fantonus, "meninges et præsertim pia, tumentes observantur, cum omnibus inflammationis signis." The symptoms in these cases were nearly uniform, headach, fever, delirium, watchfulness, and convulsive affections; and some of them present a nearer resemblance to the phrenitis of systematic writers than I have observed in any other disease that has occurred to me, in the course of this inquiry. In a case of tetanus described by Lecat, the most remarkable appearance was an evident inflammation of the pia mater, with some appearance of suppuration.

These cases of extensive inflammation of the pia mater were all speedily fatal. But it appears that both membranes are liable to inflammation, more chronic in its character, and more limited in its extent, which may go on for a considerable time, and terminates by thickening of them at particular parts, and agglutination of the membranes to each other. Many cases of

this kind are related by Wepfer,* Willis, and others. Wepfer mentions a young man who had long suffered from intense headach, and in whom the dura mater was found very rough, and united to the pia mater by strong intermediate fibres. Willis † observed, in several similar cases, such thickening and adhesion of the membranes near the longitudinal sinus, as appeared to him to impede the transmission of the blood into the sinus. In a singular case of fatal convulsion mentioned by Mr Howship, the only remarkable appearances were a firm adhesion of the membranes to each other, and to the surface of the brain on the anterior part of the right hemisphere, and a slight projection inwards of a small piece of the frontal bone, corresponding to this spot. The fatal attack, in this case, continued a fortnight, and consisted of frequent convulsive attacks, with loss of recollection. The convulsion was first confined to the left side of the body, and induced, at an early period of the disease, permanent paralysis of the left arm, and soon after of the left thigh and leg. In the subsequent attacks, the right side was convulsed, the left remaining motionless. The muscles of respiration were also much affected; he died suddenly in one of the fits. At a former period this patient had been affected with violent headach, and several convulsive attacks, and, some years before his death, he had suffered an injury of the forehead by a fall from a horse. A gentleman aged 29, mentioned by Dr Powel, after being affected for a fortnight with slight headach, became incoherent, with a considerable degree of stupor, dilated pupils, and indistinct articulation, and died in another fortnight. The pupil of the right eye was more dilated than that of the left, and a short time before death, his right side became paralytic. On dissection, effusion was found in the ventricles, and deposition of coagulable lymph about the pons Varolii. At the anterior part of the middle lobe of the brain, (he does not say on which hemisphere,) the pia mater was much thickened, and, on its inner surface, studded with small tubercles like large pin heads. Similar tubercles were found on other parts of it, especially where it lies between the convolutions. A man is mentioned by the same writer who had been two years insane, and died fatuous. He had been liable, at uncertain intervals, to convulsive attacks, in which the left side of his body suffered more than the right. An adventitious membrane, of the thickness of three sheets of writing paper, was found

* Wepfer, Historia Apoplecticorum.
† Willis, Pathologia Cerebri.

covering the whole right hemisphere of the brain. It became thinner on the lower parts of it, and was gradually lost at the base of the brain. There was no such appearance on the left hemisphere.

It is probable that this inflammatory affection of the membranes may go on in some cases for a considerable time, spreading from one part of the brain to another, and even down upon the spinal marrow, and producing a succession of symptoms, as these parts become successively affected. A lady mentioned by Mr Howship, had severe headach, impatience of light, and paralysis of the left leg and arm. After a short time, the paralysis was removed, but the arm continued so painful, as to be nearly useless. The pain of the head continued, and after two months, extended down upon the neck and back. She had then suppression of urine, severe throbbing pain of the back and loins, convulsive contractions of the shoulders, and a pain shooting through from the back to the breast. She had at last intense pain of the head, neck, back, and whole body, so as to be unable to move a single limb, and died gradually exhausted by the most severe suffering, four months after the commencement of the disease. On dissection, serous effusion was found under the arachnoid membrane, and extensive deposition of coagulable lymph on the surface of the brain, on the upper, lateral, and inferior parts. There was copious deposition of the same kind under the cerebellum, and on the anterior part of the medulla oblongata, which was principally contained between the pia mater and the arachnoid membrane. The same disease was found to have extended along the membranes of the spinal cord.

The dura mater appears to be less liable to idiopathic inflammation than the pia mater. It is, however, affected in many of those cases in which suppuration within the cranium is connected with disease in the neighbouring bone. In such cases, it is usually found soft, thickened, spongy, irregular on its surface, and sometimes eroded. The same appearances have been observed without disease in the bone. In a case of long continued headach, described by Pawius, which terminated by convulsion, the dura mater, under the sagittal suture, was found eroded and perforated. There was also an abscess in the cerebellum. Rumlerus found the dura mater eroded in several places, in a young man who died comatose and convulsed. Several cases of the same kind are related in the Miscellanea Curiosa, and Haller found in several instances the falx eroded by large openings, and the hemispheres of the brain at these places adhering to each other. The dura mater is also liable to gra-

dual thickening, which appears to be the effect of chronic inflammation. A remarkable example of this occurs in case 20, in which the disease consisted of gradual deposition of coagulable lymph between the laminæ of the dura mater. The particular character of the paroxysms in this case, consisting of sudden and transient loss of muscular power, without loss of recollection, is deserving of attention. A case is related by Lancisius, in which the symptoms considerably resembled those of this case. They consisted of paroxysms, which appeared to be a mixture of syncope and apoplexy. There were first attacks resembling syncope, then an apoplectic attack with hemiplegia, then again syncope, with convulsion. The pia mater was found remarkably thickened, and covered with a kind of ill conditioned pus. Willis found a remarkable thickening of the dura mater at the base of the brain, in a young woman who had been liable to severe headach, aggravated at the menstrual periods, and, at these times, accompanied by distortion of the neck to one side; she was also liable to vertigo and lypothymia, and died comatose. Similar cases are related by Morgagni.

### IV.—*Disease of the Bone.*

I find no case in any writer exactly resembling the remarkable affection of the bone, which I have described in case 18. There was a complete destruction of nearly the whole inner table of the cranium, and in its place, a deposition of a soft pseudo-membrane, by which the dura mater was everywhere agglutinated to the diseased bony surface. This remarkable disease had probably been going on for a considerable time. The abscess in the brain was probably recent, and the immediate cause of death. The patient was a respectable married woman, and there seemed to be no ground for suspecting a syphilitic taint. Such a disease is probably to be considered as the result of chronic inflammation of the bone, gradually extending from one part of it to another. Many cases are on record, which illustrate the progress of this most important affection. A lady mentioned by Mr Norris,* after a fall, which produced at the time no alarming symptoms, was affected with pain in the head; it generally fixed with greatest severity in the os frontis, which had been the seat of the injury. On this place, a tumour formed, which was opened three months after the injury, and the bone was found carious. The trephine was then applied, under a belief that matter might be lodged within, but none was found.

---

* Memoirs of the Medical Society of London, Vol. I.

The disease was confined to the bone, the dura mater being healthy. A similar tumour formed soon after on the occiput, under which also the bone was carious; after some time, it exfoliated, a piece being thrown off the size of a sixpence; the wound then healed. In this way, tumour after tumour formed on various parts of the head, and went through the same course. For several months, pieces of the outer table only were thrown off; afterwards, the whole depth of the cranium was separated, at each time exposing the dura mater; and from this period, the sores in the integuments did not heal. She died nine months after the commencement of these exfoliations; and on dissection, portions of the skull were entirely wanting, consisting, as far as can be judged from the engraving, of the upper half of the occipital bone, more than a third of both parietal bones, and a considerable portion of both temporal bones. There was not in this case the slightest suspicion of syphilis. A man aged 28, whose case is related by Mr Wathen, * was affected with a swelling the size of a pigeon's egg, on the left parietal bone. It gave him no pain, and continued nearly stationary for a year and a half, when a similar tumour appeared on the left side of the os frontis. These swellings increased, and after several weeks were united, so that they nearly covered the left side of his head. The swelling was colourless, without pain, and solid to the feel, and about this time he suffered some convulsive attacks. Caustic was applied to the posterior part of the tumour. When the eschar separated, the integuments were found to be two inches in thickness, and the bone beneath extremely irregular, sending up sharp bony spiculæ into the tumour, some of which were an inch in length. A similar eschar being taken out from the anterior part, shewed the same appearances. Much thin ichorous matter was discharged from the openings, and some pus. He had now frequent pain and fever, with occasional convulsion and delirium; but continued to go about, and could walk many miles. He died gradually exhausted, but retaining his faculties to the last, two years and a half after the commencement of the complaint. On dissection, the whole left side of the cranium was found perforated by numerous openings, between which there were bony ridges, filaments, and processes of a variety of shapes, the sharper spiculæ piercing the substance of the diseased integuments. The two largest perforations corresponded to the seats of the two original tumours, and corresponding to these, there were two small abscesses in the brain. The inner surface of the

* Medical Observations and Inquiries, Vol. V.

bone was diseased in the same manner as the outer, and the dura mater was connected to it by a soft fungus, which arose from every part of the diseased bone. Morgagni mentions an extensive caries of the back part of the cranium, with remarkable thickening of the dura mater, which originated in a blow, and proved fatal after six years. Hildanus relates the case of a man, on whose cranium a number of tumours formed, from which pieces of bone were discharged, at each time exposing the dura mater. The sores had healed, and the man was alive at the time when the account was written, but affected with perfect paraplegia. Similar cases are related by Portal. In two that were under his own care, and in which he had no reason to suspect any syphilitic taint, the disease was arrested by mercury and antiscorbutics. Cases have also occurred, in which extensive caries existed in the base of the cranium, producing obscure symptoms, which were only explained by dissection. In a young man who died epileptic, after having suffered long from intense headach, Zacchias found the inner table of the occipital bone carious to a small extent, the outer table being sound. A man mentioned by Mr Charles Bell, who had a deep venereal ulcer in the throat, became suddenly paralytic, and after three days died apoplectic. On dissection, the ulcer was found to communicate through the basilar process of the occipital bone, with an ulcer of the medulla oblongata, and this ulcer had opened the basilar artery. A woman mentioned by Saviard, who was received into the Hotel Dieu, in consequence of an injury of the head from a fall, suffered successive exfoliations of both tables of the cranium, to such an extent, that the pieces, when put together, resembled the skull-cap, as it is sawn off in dissection. This process occupied two years, at the end of which she was dismissed in good health, but with the upper part of the brain covered only by integument. Allied to this disease, is a softened state of the bones of the cranium, which is sometimes met with. I believe it has been observed in some cases to continue a long time without making progress; but its tendency generally is to terminate by the formation of suppurating tumours, under which the bone is found carious.

Such are the effects of chronic inflammation affecting the bones of the cranium. It may arise from injuries, or without any apparent cause; its progress is slow, but when once excited it is impossible to conjecture how far it may extend. Like every inflammation of a bone it is apt to terminate by caries, or the death of the part—it may spread from one part to another, producing the most extensive mischief—or it may extend to the dura mater and brain, and thus be speedily fatal. Many surgical writers teach, that, in wounds or injuries of the

head, it is the separation of the pericranium or dura mater that kills the bone. But every practical surgeon must have seen cases in which the pericranium was separated without any such consequence following, and others in which the bone became carious though the pericranium had not been separated. In a case related by Dessault, in which death followed a blow on the head after a month, the bone was externally sound, and its coverings healthy; the internal table was blackened through the whole extent of one of the parietal bones, yet the dura mater adhered to this portion as firmly as to the sound bone:—there was suppuration on the surface of the brain. It appears to be the inflammatory action that kills the bone, and this action we have seen may leave the seat of the injury, and spread from one part to another, until its progress is arrested by the powers of the constitution, acting in a manner which eludes our observation, and which is very little under our control. If this view of the subject be correct, it should perhaps diminish our eagerness to meddle with such cases by the trephine, and our expectation of curing them by frightful operations. If symptoms indicate the formation of matter under the bone, this must be evacuated, and a piece of carious bone should certainly be removed when it can be done without violence; but we must remember, that the real disease is the inflammatory action, which may continue to spread, though we may remove these effects which it has left in its progress. Perforations will remove the danger from lodgement of matter, but this danger only; and their other effects on parts, thus prone to inflammatory action, are extremely ambiguous. When matter is formed within, it is probably the effect of inflammation of the membranes, and not a necessary effect of the disease of the bone; and cases are related by Morgagni and others, in which, after injuries of the head, matter was formed betwixt the cranium and the brain, without the least appearance of disease in the bone. It is perhaps a point deserving inquiry, whether too much attention is not sometimes directed merely to the state of the bone; whether we do not waste time in attending to its progress, and in watching the proper period for making perforations; while during this interval an insidious disease is going on within, which will indeed at length render perforations necessary, but which might, by active treatment, be prevented from advancing to suppuration.

A remarkable circumstance in the history of these affections is, the slowness with which the bone falls into disease, and the length of time during which a small extent of disease may exist, producing urgent symptoms, but without making much progress. A lady mentioned by M. Marechal, after a slight blow

on the head, suffered constant pain in the part, often aggravated into violent paroxysms, which the most active treatment had failed to remove. After severe suffering for several years, an incision was made, and a small portion of the bone was found carious. This portion was removed by the trephine, and the patient got well. The disease in this case was probably superficial, and I believe in some similar cases, simply exposing the bone, and assisting its exfoliation, has answered as well as this formidable operation. In other cases of this kind, the disease is from the first confined to the inner table, from which it may, after a long interval, extend inwards, and terminate by fatal disease in the brain. A lady mentioned by Mr Howship received, at the age of 15, a slight blow on the right parietal bone, and for 30 years was liable to severe headachs which were constantly referred to that spot as their centre and principal seat. She then became drowsy, and her vision was impaired, and at the age of 50 she died comatose. At the seat of the injury, the bone was carious on its inner surface, and so thin from absorption as to be transparent—the brain under this part was of a dark livid colour and much indurated, and this disease extended through the whole middle lobe. In some cases, again, it appears that the disease may be first external, and that it may afterwards leave its original seat, and extend to the internal parts. A boy mentioned by Mr Howship, received at school a blow on the head with a ruler. It was followed by a small sore, which continued to discharge matter for six years. It then healed, and soon after his sight was impaired, and he become epileptic. The trephine was applied on the seat of the injury without relief; he died on the third day after the operation. The bone and dura mater were sound, but the pia mater, under the seat of the injury, "had evidently suffered from chronic inflammation," and the brain was much indurated through the whole extent of the middle lobe.

A singular variety of this disease occurs, in which, after an injury of the head, a portion of the bone disappears by absorption, without ulceration of the integuments. A child, aged 9 months, mentioned by Mr Howship, received an injury on the right parietal bone from a fall. There was no wound and no urgent symptoms at the time; but several weeks after the accident the pulsation of the brain was distinctly perceived at the place of the injury, and the child became paralytic in the left side. At the age of four years, when the account was written, she had recovered the use of the left side, which had been improving gradually, and was otherwise in good health, but there was still a considerable deficiency of bone at the place of the injury.

When she cried or coughed, this part became tense, and evidently swelled. Many cases have occurred in which tumours on the dura mater have occasioned absorption of a portion of the bone, and have appeared under the integuments.

### V.—*Disease of the Pericranium.*

Many obscure affections of the head, often accompanied by very urgent symptoms, have been found to be connected with a disease of the pericranium, the history of which presents some very singular phenomena. In the cases related by Sir Everard Home, * the symptoms in general were headach, with various uneasy feelings in the head, a painful tenderness of the scalp at a particular spot, with some degree of swelling or thickening of the integuments at the place. In one the sight and hearing were considerably impaired, and in several of the cases there were fits resembling epilepsy. They were treated by dividing the integuments and pericranium freely, down to the bone, and then dressing the wounds with lint, so as to allow them to heal slowly, with suppuration. In making the incision, the pericranium was found morbidly sensible and considerably thickened, and in some of the cases indurated, approaching to the structure of cartilage. This treatment was in some of them followed by immediate and permanent relief; in others the patient continued liable to fits or head symptoms upon any excess. In some of them the incisions healed without any affection of the bone being discovered, in others a portion of the bone appeared white and porous, or honey-combed, and a limpid fluid appeared to percolate through it, which returned immediately as often as it was wiped off. In one of these cases the porous piece of bone exfoliated after the wound had been dressed with dry lint for six weeks; the wound then healed, and the cure was permanent. In another, after waiting eight weeks for the exfoliation, he touched it repeatedly with dilute nitrous acid, after which it exfoliated, and the cure was permanent. In one fatal case he found the pericranium thickened into a mass of a fibrous bony texture, and, corresponding to this part internally, there was a similar thickening and induration of the dura mater. Most of these cases had been treated by long courses of mercury without benefit, in some of them with aggravation of the symptoms.

---

* Memoirs of a Society for the Improvement of Medical and Surgical Knowledge, Vol. III.

This affection seems to correspond with the disease which has been described by Mr Crampton, under the name of Periostosis. * Among his cases of this disease affecting various parts of the body, there are two remarkable examples of it in the head; the one acute, the other chronic. In the former, a boy of 14, the complaint began with a small angry tumour on the right side of the nose, from which, after some days, a swelling extended along the right eye-lids and forehead, with considerable erysipelatous inflammation, and fever. On the 9th day he became suddenly comatose, then convulsed, and died on the 12th. On dissection, the pericranium covering the frontal bone was found red, thickened, and detached from the bone, much purulent matter lying between them. Internally the dura mater was detached to an extent corresponding to the disease without, and a greenish puriform fluid was effused between it and the bone. The inner surface of the dura mater was also covered with pus; the pia mater was red, very vascular, and covered with pus, to the extent of two inches, on the part corresponding to the principal disease of the pericranium. The other case is that of a woman, aged 32, who was affected with a tumour the size of half a walnut over the left parietal bone. It was soft and elastic, and its origin was ascribed to a blow six months before; there was an opening in the tumour by which a probe could be passed down to the bone. She had intense pain in the left side of the head; the right arm was withered and paralytic; both lower extremities were feeble; her speech was indistinct; she had vomiting and frequent epileptic fits. The tumour was divided freely down to the bone, and in doing so the pericranium was found thickened, firm, and fibrous, and morbidly sensible. It formed the principal part of the tumour. The bone under the tumour was found rough, and superficially carious. A portion of it was removed by the trephine, and the dura mater under it appeared very vascular and rather thickened. For six days after the operation she had fever, extensive erysipelas of the head, delirium, and convulsions. Suppuration was then established, and all these symptoms were relieved. In the course of the cure a slough was detached from the dura mater. A fortnight after the operation she had recovered the use of her arm, and was free from complaint.

Tissot † seems to have met with this disease, and to have

---

* Dublin Hospital Reports, Vol. I.

† Tissot, Epist. Med. Var.

treated it upon the same plan, though he gives a different explanation of the effect of his treatment. He describes a case in which an intense pain was confined to a very small spot, at the posterior angle of the right parietal bone. It had resisted for a long time all the most powerful remedies, venesection, arteriotomy, issues, cupping, &c. He cured it immediately and permanently, by dividing the part down to the bone, and encouraging suppuration from the wound. He ascribes the cure to the division of the subcutaneous nerves. A woman mentioned by Pouteau, received a blow behind the left ear, from the immediate effects of which she soon recovered, but she continued to be affected with pain in the spot for four years. She then had convulsions, paralytic symptoms, inarticulate speech, and a long train of the most urgent symptoms, which sometimes resembled mania and sometimes tetanus. She had still pain at the place of the injury, where a small portion of the integument was red, and very gentle pressure upon the spot produced convulsion. By a free incision down to the bone, and allowing the wound to suppurate, all these complaints were removed. A boy mentioned by the same writer, received an injury on the crown of the head by a fall, at the age of eight years. A painful feeling continued in the scalp at the place of the injury, and for ten years, he was liable to intense headachs, which afterwards became so violent, as often to occasion insensibility. At the age of 24, there was, at the upper part of the right parietal bone, (the original seat of the injury and of the subsequent uneasiness,) a spot which was slightly red and a little swelled, the hair upon it was coarse, and stood out like bristles, and pressure upon it produced intense pain. The pain extended to the right eye, the vision of which was obscured when the pain was violent. By a free division of the parts, every symptom was removed. A similar case is related by M. Gervais, in which the pain returned periodically, and the patient suffered epileptic fits daily. A slight touch on the affected part produced syncope. On dividing the integuments and pericranium, the surface of the bone was found carious; this soon exfoliated, and the patient recovered perfectly. Valsalva has taken notice of a remarkable thickening of the pericranium, in a case of long-continued headach with occasional delirium, and at last convulsion. There was serous effusion in the brain; he says nothing of the state of the dura mater or the bone.

This singular affection, Sir E. Home considers as beginning in the dura mater. Mr Crampton thinks it commences in the pericranium. The latter opinion seems to be the most probable, for in some of Sir E. Home's own cases, it was cured by

simply dividing the pericranium. It appears, however, that, in the progress of the disease, both the bone and the dura mater are apt to be affected.

### V.—*Disease of the Sinuses.*

I suspect that disease in the sinuses of the dura mater occurs more frequently than we suppose, in connection with, and probably the cause of, various diseases of the brain. How much diseases of these parts would affect the circulation of the brain, is obvious, and perhaps the condition of them in affections of the head has not been sufficiently investigated. Original deviations from the common size and distribution of the sinuses are frequently met with, but there can be little danger of confounding these with alterations in their area produced by disease; for, in the latter case, there will be the marks of chronic inflammation in the dura mater forming the sinus, a particular part of it being thickened, spongy, fungous, or ulcerated. This was exemplified in case 17, in which there can be little doubt that the original disease was inflammation of the coats of the lateral sinus, terminating by suppuration, and combined with caries of the bone at the spot which seems to have been the principal seat of the disease. In the Queen of Louis XV. who had long suffered from severe complaints in the head, and at last died of dropsy, the superior longitudinal sinus was found obliterated by ossification of its coats.* The subject is worthy of particular investigation.

## Sect. IV.—Causes and Treatment of Chronic Inflammation of the Brain.

In its least active form, the disease is an example of the pure scrofulous inflammation, which in other parts of the body is often excited by very slight causes, and often appears without any cause that we can trace. On the surface of the body, we see it excited by very slight injuries, which, in a healthy constitution, would produce no bad effect. It frequently follows altered determinations of blood: thus I have seen suppression of the menses in a young woman of a scrofulous habit, followed immediately by extensive abscess in the mamma. Scrofulous or chronic inflammation also appears in connection with a variety of febrile complaints, as if the mere febrile state brought it into action. In this manner we meet with it affecting the lungs, the bowels and the glandular parts, in continued fever, and in

* Portal, Cours d'Anatomie Medicale.

scarlatina. These observations apply to chronic inflammation of the brain.

1. It often appears in the course of various febrile diseases, as if the mere febrile action induced it. In this manner, Hydrocephalus may follow measles, scarlatina, and continued fever. I have given a remarkable case in which it followed inflammation of the bowels: it has also occurred in connection with pneumonia.

2. It may follow injuries; and this, I suspect, is a more frequent cause of hydrocephalus than we are generally aware of, the injury being often slight, and the interval considerable between it and the appearance of any alarming symptoms. A man, aged 40, of a scrofulous habit, was standing on a cart at Leith races, when the horse moving forward he lost his balance and fell out of the cart, striking his head upon the sand. He felt at the time no inconvenience, and for a week attended to his business, but complained frequently of headach. He was then confined to the house from increase of headach, vomiting, and slight fever; after a few days, he became oppressed, then comatose, and died at the end of the second week. All the ventricles of the brain were found distended with serous fluid. A girl, aged 13, fell from a swing, and struck her head with some violence on the ground. From that time she complained of headach, but was not confined, nor was her health otherwise affected, until six weeks after the accident, when her headach increased, and was accompanied by vomiting and frequent pulse. The vomiting soon subsided, and was followed by slight delirium, and this by coma. She lay in a state of coma five or six days, and then died, two months after the fall. All the ventricles of the brain were found distended with serous fluid, without any disease in its substance.

3. *Suppressed Evacuations.*—The most common example of this is suppression of the menses, which in young women of unsound constitutions is frequently followed by dangerous affections of the brain. Such suppression, followed by headach, is always to be considered as a case requiring minute attention. Effusion in the brain, following suppression of urine, or remarkable diminution of this secretion, affords another example of this kind, which presents a most interesting field of investigation. In February 1816, a gentleman aged 70 complained to me that he could pass no urine; he made no other complaint, and on introducing a catheter, the bladder was found to be empty. For six days he continued in this state, keeping the house, but complaining of nothing, except one or twice, when closely questioned, of slight uneasiness in his back. On the 7th

day he had slight confusion of thought and indistinctness of speech. On the 9th he became comatose, and died on the 13th. On dissection, considerable serous effusion was found in the ventricles of the brain: the bladder was empty. Both kidneys contained a good deal of urine. Both ureters were completely obstructed by large calculi, the one immediately at its commencement at the kidney, the other about three inches from the kidney. Similar symptoms follow the proper Ischuria renalis, or suspension of the secretion of urine. The causes of this affection are very obscure. It often appears in connection with peritoneal inflammation, and sometimes occurs in continued fever. In a remarkable case of it which I saw lately, the only morbid appearances were slight inflammation on the liver, and a remarkable dark gangrenous appearance in the cellular membrane behind the left kidney.

4. Chronic inflammation of the brain often appears in persons affected with chronic or scrofulous disease in some other part of the body. This is called translation of disease, and I shall not object to the term, provided it be used merely to express the fact, that, in persons affected with such disease in other organs, the brain often becomes affected. The most frequent example of this that has occurred to me, is the brain becoming diseased in persons ill of phthisis. A man aged 20 had been for several months affected with cough, expectoration often bloody, hectic fever, night sweats, difficult breathing, increasing debility and emaciation. He was becoming rapidly worse, and was confined to bed, when on the 18th October, 1813, he had frequent desire to pass urine, which was much diminished in quantity. After a few days, he had severe headach, with impatience of light. After several days more, these were followed by confusion of thought and slight delirium, and these by coma, with dilated pupil: he died on the 28th. From the first appearance of these complaints, the pulmonary symptoms had diminished, and for the last six or seven days the cough had entirely ceased. The pulse had continued about 120. On dissection, much effusion was found in the ventricles and on the surface of the brain. The fornix and septum lucidum were broken down into a soft white pulp. The left lung was a mass of tubercular disease, and contained several abscesses. The right was also tubercular, but not ulcerated. I have seen several other cases of the same kind. In one of them, the head symptoms began about a month before death, with attacks of loss of speech, continuing a few minutes, and accompanied by a sensation of prickling and numbness of the right side of the face. A fortnight after this, he had headach and slight de-

lirium, followed by stupor, which was fatal in another fortnight. The cough had gradually subsided as the head symptoms advanced. In another man, aged 22, who had been ill five weeks with severe pulmonary complaints, the first head symptom was double vision, without headach. He complained of dysuria, and his pulse was irregular. He died comatose after three days, and considerable serous effusion was found in the ventricles of the brain.

In such cases the first disease cannot be considered as the cause of the head affection; it merely marks the tendency to scrofulous or chronic inflammation; and in a habit so disposed, the disease of the brain may be excited by causes which elude our observation. On the same principle, disease in the brain may appear in combination with disease in any other organ, especially in unhealthy children. In such cases, the liver has often been found diseased, and, founded upon this observation, I have somewhere seen certain crude speculations on diseased liver being a *cause* of hydrocephalus.

In regard to the *Diagnosis*, I have already mentioned the symptoms which may be considered as the peculiar indications of a dangerous affection of the brain. But the most important and the most difficult part of the diagnosis is in the beginning of the attack, and before the appearance of these peculiar symptoms, to distinguish the disease from simple fever. I do not know any symptom that can be relied upon for this purpose. The distinction must depend upon that minute and careful attention to the correspondence of the symptoms which I have already alluded to. Severe headach, with oppression, combined with smart fever, foul dry tongue, and the usual febrile symptoms, *may be* simple fever. The same degree of headach, with slight fever and clean tongue, should be suspected of being an affection of the brain. The remarkably variable state of the pulse which I have mentioned, is also worthy of attention, and I think it does not occur in any other febrile disease. It however is not always present in head affections, and, when it is present, it is often not till an advanced period of the disease.

On reviewing the facts that have been related in this paper, the following pathological principles appear to be fair and legitimate conclusions.

1. That in cases of hydrocephalus, the coma and other symptoms are not to be considered as the direct effect of the effusion, but of that morbid condition of the brain of which the effusion is the consequence.

2. That we have no certain mark which we can rely upon as indicating the presence of effusion in the brain. Slowness of the pulse, followed by frequency, coma, squinting, double vision,

dilated pupil and paralytic symptoms, we have seen, may exist without any effusion.

3. That these symptoms may exist in connection with a state of the brain which is active, or simply inflammatory; while the disease is the subject of active treatment, and while by such treatment, adopted with decision and promptitude, we have the prospect of arresting its progress in a considerable proportion of cases. The ground of prognosis in particular cases is obvious. The more they approach to the character of acute phrenitis, the prospect of cutting them short will be the greater, and the more they partake of the pure scrofulous inflammation, it will be the less. In all of them, the period for active practice is short, the irremediable mischief being probably done at an early period of the disease.

This leads me to the important question, Has Hydrocephalus been cured? Many cases have certainly recovered, which, in their symptoms, bore the strongest resemblance to it. By some, these cases have been confidently brought forward as examples of hydrocephalus cured, while others have only considered them as remarkable from their singular resemblance to that disease. If the doctrine be admitted which I have contended for in this paper, we shall be able to assume a more precise principle. We shall see reason to believe, that we have no certain mark by which we can ascertain the presence of Hydrocephalus, but that all the usual symptoms of it may exist in connection with a disorder of the brain, which, if allowed to go on, would probably lead to hydrocephalus, but which, if treated with decision in its early stage, holds out a fair prospect of being able to arrest its progress. Whether the fluid can be absorbed and the disease cured after effusion has taken place, must ever remain matter of conjecture; but this important principle I venture to state as extremely probable, that, in a great proportion of cases, the absorption of the fluid, if it did take place, would in no respect improve the situation of the patient, as there would still remain that deep-seated and irremediable destruction of the central parts of the brain, which so often accompanies the effusion, and which, without any effusion, may be fatal, with all the usual symptoms of Hydrocephalus. It was well remarked by an eminent writer, "dropsy is the effect of a disease, not the disease itself;" it is strictly true of the dropsy of the brain.

In the treatment, everything depends upon the remedies being applied at an early period, and in the most decided manner. The remedies are few and simple. Blood-letting, repeated according to the age and habit of the patient, purging, and cold

applications, I consider as those on which our chief reliance is to be placed. The effect of blistering is ambiguous. When it is employed, it should perhaps be on the back of the head and neck. In that situation, it is probably more likely to be useful than on the crown, while it does not interfere with a more powerful remedy,—the effectual application of cold. I have little reliance on mercury. In some cases, a sudden and smart salivation has appeared to be useful, but I suspect it is rather upon the principle of a drain, or counter-irritation, than by any specific operation as mercury. In many cases, especially during the first, or most active stage, the indiscriminate employment of mercury, I apprehend, may be injurious. Still less reliance is to be placed in diuretics; but in the more acute cases, digitalis may be useful, by restraining vascular action. In applying cold to the head in the most effectual manner, it should be done by a stream of cold water directed against the crown of the head, and continued for a considerable time, until the full effect of it be produced. Applied in this manner, it is a remedy of great power; it even requires, in many cases, to be used with discretion. Under its operation I have seen a very strong man thrown, in a very few minutes, into a state approaching to asphyxia, who immediately before was in the highest state of maniacal delirium, with morbid increase of strength, defeating every attempt of four or five strong men to restrain him. The following example of its beneficial effect occurred to me lately: A strong plethoric child, aged about 5 years, after being for one day feverish, oppressed, and restless, fell rather suddenly into a state of perfect coma, without convulsion, or any other symptom. She had lain in this state about an hour when I saw her; she lay stretched out on her back, motionless, and completely insensible, her face much flushed, and turgid. She was raised into a sitting posture, and a basin being held under the chin, a stream of cold water was directed against the crown of the head. In a few minutes, or rather seconds, she was completely recovered, and next day was in her usual health. The same remedy I am in the habit of using, with the best effect, in the convulsive diseases of children.

Under the treatment which I have now mentioned, I have seen many cases recover, which, in all their symptoms, when compared with the fatal cases, might fairly be considered as examples of chronic inflammation of the brain. Many of them were cut short at an early period, when the symptoms might perhaps only be considered as highly suspicious; but others, as will be seen, exhibited the most characteristic symptoms of this

dangerous affection of the brain. I shall conclude this essay by a very few examples of different forms of the disease.

Case I.—Miss B. aged 17, had violent headach, intolerance of light, vomiting, much oppression, approaching to coma; pulse 120; tongue clean and moist. She was treated by general bleeding, which was repeated four times; purgatives; cold applications to the head; and blistering on the neck; and the case terminated favourably, after she had been five or six days in a state that indicated much danger of a serious affection of the brain.

Case II.—A girl, aged 11, had violent headach, vomiting, stupor, bordering on coma, dilated pupil, great obstinacy of the bowels, pulse 130. Had been ill five or six days. Purgatives, blistering, and mercury to salivation, had been employed, without benefit. One bleeding from the arm gave an immediate turn to this case. The headach was relieved; the pulse came down; the vomiting ceased; the bowels were acted on freely by the medicines which they had formerly resisted; and in a few days she was quite well.

Case III.—Mrs J. aged 45. After the catamenia had been obstructed for four months, had severe headach, sense of weight and fulness in the head, much oppression, and double vision; pulse was at first 72, but on the following day had risen to 100. On the first day she was bled to ℥xxviij. with little relief. On the second topical bleeding, blistering and smart purging were used; but the symptoms continued unabated. On the third day, another bleeding of ℥xx. gave a turn to the complaint, and in a few days more, with purging and spare diet, it terminated favourably. The last symptom that yielded was the double vision. It subsided slowly, the two images gradually approaching nearer each other; but was not entirely gone for nearly a fortnight.

Case IV.—Miss D. aged 7, had severe headach, impatience of light, stupor, slight delirium, squinting, and great obstinacy of the bowels; pulse 120; tongue at first foul, but became clean after a day or two. The other symptoms continued unabated for a week, during which her situation was considered as hopeless. Strong purging being then produced, she recovered in a few days. Topical bleeding and blistering had also been used. The case might probably have been much shortened by general bleeding.

Case V.—Miss H. aged 11, one of a family in which several had died of hydrocephalus. September 21st, 1817, had severe headach, giddiness, and much vomiting, pulse natural. Topical bleeding, purgatives, &c. being employed, she was rather relieved on the 22d. On the 23d, she still complained of her head, and the pulse had fallen to 60; on the 24th, the pulse fell to 50, there was much headach, great oppression, and dilatation of the pupil. Two bleedings from the arm were now employed with much relief,—the second produced syncope. 25th, Pulse 80 to 90, symptoms relieved. The complaint then subsided gradually under the use of purgatives and cold applications, and at the end of the month she was well.

Case VI.—Miss W. aged 15, had violent headach for several days, with impatience of light, then stupor, squinting, double vision, and transient fits of delirium. The pain suffered paroxysms of violent aggravation, which produced screaming and violent agitation of the whole body, and, at times, a threatening of convulsion. Bowels very obstinate, occasional vomiting, pulse very variable, sometimes extremely frequent, at other times little above the natural standard. This very violent case was treated by repeated general and topical bleeding, blistering, purgatives and mercury given to affect the mouth. Under this treatment, the complaint subsided, but after she appeared to be well, it suddenly returned with the same violence as before, and was again subdued by the same remedies. In this manner she relapsed five or six times, and at last got well after the case had been drawn out to many weeks.

Case VII.—Mr L. aged 17. 1st February 1810, had symptoms of continued fever for a week; the skin then became cool and the tongue clean, but he had severe headach with considerable stupor; Pulse 100. General bleeding was then employed, followed by purging and mercurial frictions, and after a few days the symptoms were alleviated, but there was still much headach, with oppression, and a remarkable slowness of speech.

14.—Stupor increased, pulse 86, tongue clean, skin cool.

16.—Much incoherent talking and unmanageable delirium.

18.—Increasing stupor. Pulse 84.

19.—Partial relief, after smart purging.

20.—21.—Stupor increased.

22.—Perfect coma, eyes natural, Pulse about 100.

He had continued in this state four days, when, on the 27th, strong purging was induced to the extent of about fourteen stools in the day, with complete relief. On the 28th, there was

some delirium, which subsided in another day. For a week he continued to complain of headach and weight in the head, but on the 10th of March was free from complaint.

Case VIII.—Miss P. aged 21. July 1815, had symptoms of continued fever, which went on for three weeks. The pulse then came down to 84, and the tongue became clean, but she had much headach, transient delirium, considerable stupor, bordering upon coma, and the pulse rose again to 120. In this state she continued a fortnight, with every appearance of a head affection of the most dangerous character. Repeated topical bleeding, blistering, purgatives, and large doses of calomel being employed without relief. The calomel did not affect the mouth, and had very little effect on the bowels. At the end of the fortnight, she was suddenly seized with copious discharge of blood from the bowels. This continued three days, and left her extremely pale and exhausted, but free from stupor, and the headach was much relieved. In five or six days more she was well.