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BY JOHN ABE

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PATHOLOGICAL

AND

PRACTICAL RESEARCHES

ON

DISEASES OF THE BRAIN

AND THE

SPINAL CORD.

BY JOHN ABERCROMBIE, M.D.

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, &C.

AND FIRST PHYSICIAN TO HIS MAJESTY IN SCOTLAND.

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PREFACE.

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PREFACE.

It is a matter of the utmost delicacy for a physician to obtrude upon the profession his general statements, in regard either to the phenomena of disease, or the action of remedies. The value of such statements does not depend upon his veracity only, but, must likewise rest in a very great degree, upon the character which he bears as a philosophical observer, and the extent of the observations on which his conclusions are founded. Hence arises the hesitation with which we receive all general statements, when made by persons with whose opportunities of observation and habits of induction we are not acquainted; and the importance which we attach to a simple record of facts, in a concise and accessible form, apart both from hypothesis and system. The author of such a record contributes that which has a fixed and certain value, dependent only upon his correctness in distinctly describing what he has seen; and thus is furnished a series of facts which every practitioner may study for himself, and from which he may acquire a knowledge of phenomena, and of their relations to each other, nearly in the same manner as he does from his own observation.

In the revolutions of medical science there has been, for some years, a progressive and remarkable change of opinion, in regard to the mode of conducting medical investigations. There appears to have been a tacit but very general admission of the fallacy of medical hypotheses, and the precarious nature of general principles in medicine; and there seems to be an increasing conviction of the indispensable necessity, of founding all our conclusions in medical science, upon an extensive and accurate acquaintance with the pathology of disease. The facts which are required for this purpose can be derived only from the contributions of practical men; and it is of the utmost consequence that such persons should extensively record their observations, as these must form the only basis on which can be founded any legitimate principles in medical science.

General principles in physical science are nothing more than general facts, or facts which are common to all the individuals of a particular class; and it is only when they are deduced from a correct examination of all these individuals, that they can possess either truth or utility. When they have been framed from a limited observation, they are, in general science, useless, and in medicine, dangerous; and in regard to medical science we may perhaps venture to assert, that the purposes of practical utility are promoted in almost an equal degree, when a principle which has been proposed is confirmed by the progress of observation, and when one which has been received upon inadequate grounds is shown to be fallacious.

Influenced by these considerations, the author of the following treatise has, from time to time, sub-

mitted to the profession a series of researches, on various important subjects, of a pathological and practical nature; and he now intrudes upon their attention with farther observations, in a more connected and more extended form. In doing so, he has no system to support, and no new doctrines to propose. He may indulge in conjectures, but these he will keep entirely distinct from the facts upon which they are founded. He assumes no higher character than that of a faithful relater of facts, which a practice of considerable extent has brought under his view; and he aspires to no higher merit, than to contribute something towards enlarging our acquaintance with the phenomena of disease.

This volume is divided into four parts. The three first of these refer to diseases of the BRAIN, arranged under three clases, the INFLAMMATORY, the APOPLECTIC, and the ORGANIC. This arrangement will probably answer every practical purpose; for, though the affections of the inflammatory class generally terminate by an apoplectic state, or a state of coma, and the organic affections are often distinguished by apoplectic paroxysms, yet, in a pathological point of view, the classes appear to be sufficiently distinct, for the purpose of an arbitrary division of the subject. The fourth part refers to the diseases of the SPINAL CORD, and its membranes; and in an appendix to this part, a slight outline is given of the present state of our knowledge in regard to the pathology of NERVES.

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Edinburgh, August 1834.

PREFACE

TO

THE THIRD EDITION.

In the third Edition, which, for the accommodation of students, is printed in a small and portable form, a considerable number of new facts and observations have been added from various sources. The more important of the new matter, of an original kind, will be found in Cases 7, 26, 80, 85, 96, 121, and 132. In preparing this Edition, the Author has also availed himself of many important observations, which have been added, in the form of notes, to the French translation of this volume, by M. Gendrin. Whenever the name of that eminent individual occurs, the reader will understand that this translation is referred to.

Edinburgh, August 1834.

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PATHOLOGICAL

AND

PRACTICAL RESEARCHES

ON

DISEASES OF THE BRAIN

AND

THE SPINAL CORD.

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DISEASES

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PART I.

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OF THE BRAIN.

Peculiar difficulties attend the investigation of inflammatory affections of the brain. In the inflammatory diseases of other organs, we are generally able to trace the proper symptoms of the inflammation through the whole course of the disease, and to make allowance for any incidental combinations by which they may be modified; but from the rapid effects which all acute diseases of the brain produce upon the sensorial functions, the patient generally becomes, at an early period, unable to express his feelings, and the proper symptoms of the disease are lost amid that suspension of all the faculties to which we give the name of oppression of the brain.

Whenever this remarkable condition occurs, it naturally becomes the prominent object of attention; and, as it has been by long-established usage strongly associated with the idea of pressure upon the brain, the investigation has generally been directed to the discovery of a compressing cause. Effused fluid having been found upon examination after death, in a great pro-

portion of the cases referred to, has on this principle been considered as explaining the symptoms, and here probably the investigation has closed.

This course of inquiry seems to have been the occasion of much of that obscurity which so long involved the pathology of affections of the brain, particularly the pathology of acute hydrocephalus. More extensive acquaintance with the phenomena of this class of diseases has shown us that the course was fallacious, and has enabled us to ascertain principles of the utmost practical importance. We have learned that the condition which we denominate coma, with its usual concomitant symptoms, is not characteristic of any one condition of the brain, but that it may exist in connexion with diseases which are very different, or even opposite in their nature; that it does not prove the existence of any compressing cause, and particularly that it has no necessary connection with effusion in the brain; farther, that effusion to a great extent may exist in the brain, without producing any of the symptoms which have usually been ascribed to it, and, in particular, that these may all exist in connexion with a state of disease which is simply inflammatory. Following the light thus obtained, we find in the phenomena accompanying inflammation of the brain and its membranes, a subject of much interest and great extent, and one which leads to results of the highest practical value. When applied to the pathology of the disease commonly called acute hydrocephalus, the importance of this investigation is particularly apparent. For I think we may now consider it as ascertained, that this formidable malady is not a mere dropsical affection of the brain, but an inflammatory disease, terminating by effusion; that many of the leading symptoms are not connected with the effusion, but with the inflammatory condition which goes before it; and that without any effusion it may be fatal, with all the symptoms which have usually been considered as characteristic of hydrocephalus.

When we enter more particularly upon this inquiry, we find inflammatory disease in the brain varying con-

siderably in its characters in different cases. These varieties appear to be referable to three circumstances;—the seat of the inflammation—its degree of activity—and the mode of its termination. It may be seated in the Dura Mater, the Pia Mater, the Arachnoid, the substance of the Hemispheres, or the deep-seated central parts of the brain. In its activity, it varies from the highest degree of active inflammation, to the chronic or scrofulous inflammation with the lowest degree of activity, and with numerous modifications by which the different forms pass into one another by almost insensible gradations. It may terminate by serous effusion, by the deposition of false membrane, by suppuration, or by the ramollissement of the cerebral substance. The phenomena resulting from these several varieties, present to us a field of investigation of great extent and considerable difficulty. But before entering upon the inquiry, it will be advisable to take a general view of the symptoms which indicate inflammation of the parts within the head.

SECTION I.

GENERAL VIEW OF THE SYMPTOMS WHICH INDICATE INFLAMMATORY DISEASE WITHIN THE HEAD.

Our knowledge of this subject is not sufficiently matured, to enable us to say with confidence what symptoms indicate inflammation of the substance of the brain, as distinguished from inflammation of its membranes; but the distinction is not of much practical importance, and our present purpose will be answered by a general view of the symptoms which indicate inflammation of any of the parts within the cranium. They appear under a variety of forms, depending probably, either upon the activity of the disease, or the particular part which

is the seat of the inflammation. The leading modifications, as they occur to us in practice, may be referred to the following heads.

I. As the first form of the disease, perhaps we ought to place the *Phrenitis* of systematic writers. It is characterized by fever, watchfulness, acute headach, impatience of light, suffusion of the eyes, and maniacal delirium. This affection, however, is seldom met with as an idiopathic disease, except in a few cases in which it is brought on by the abuse of strong liquors, and in warm climates by exposure to the intense heat of the sun. As a symptomatic affection, it is met with occasionally in fever, and in mania; and a condition nearly allied to it sometimes occurs after injuries of the head. Circumstances will be afterwards mentioned, which render it probable that in this form of the disease the inflammation is primarily seated in the membranes of the brain. When fatal, it is generally by a rapid sinking of the vital powers supervening upon the high excitement, without producing much disorganization of the parts which appear to have been the seat of the disease; for the cases which are referable to this class, when they terminate fatally, are generally rapid in their progress, and the appearances on dissection are often unsatisfactory. There is an affection of frequent occurrence, which perhaps may be referred to this head. It is characterized by a peculiar aberration of mind without any complaint of pain. There is a remarkable restlessness, quickness and impatience of manner, obstinate watchfulness, and incessant rapid talking, the patient rambling from one subject to another, with little connexion, but often without any actual hallucination. He knows those about him, and generally answers distinctly questions that are put to him. There is a rapid pulse, but without the other symptoms of fever; and the disease is apt to be mistaken by a superficial observer for mania, and consequently to be considered as not being attended with danger. But it is an affection of great danger, and is often very rapidly fatal. The nature of it is obscure, and the appearance on dissec-

tion is rather unsatisfactory; it consists chiefly of a highly vascular state of the Pia Mater, without any actual result of inflammation.

II. In a second form of the disease, which is worthy of much attention, the first symptom that excites alarm is a sudden 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 vomiting, in another by slight headach for several days. The convulsion is generally long and severe; in some cases it is followed immediately by coma, which in a few days is fatal; in others, the convulsion recurs frequently at short intervals, the patient in the intervals being sensible and complaining of headach, and after twelve or twenty-four hours, passes into coma. Sometimes after the coma has continued for a certain time, perhaps for twelve hours, there is a 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 a very interesting modification of this form of the disease, the convulsion is confined to one side of the body, or to one limb, and is usually followed by paralysis of the part affected; and in some cases, the first symptom is a sudden attack of paralysis without the preceding convulsion. These cases are remarkable from their resemblance to the ordinary attack of hemiplegia. It will appear in the sequel, that they are often connected with inflammation of a small defined part of the cerebral substance; that the attack may be so sudden as precisely to resemble the paralytic attack from other causes; and that the disease in the brain may not have advanced beyond the state of simple inflammation, while the symptoms have gone through the usual course, and have terminated in fatal coma. In general, however, the disease in such cases will be found to have advanced to suppuration, or to the ramollissement or peculiar softening of the cerebral substance, to be afterwards more particularly referred to; while, on the other

hand, in some very interesting cases of this class, the inflammation will be found to have been entirely seated in the membranes.

III. The third 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 acute 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 others, the vomiting is absent. The pain is felt in various parts of the head; frequently it extends along the neck; and sometimes pain is complained of in the arms and in other parts of the body. The pupil is usually contracted; the eye is 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 attended through its whole course by a spontaneous diarrhœa. After some days, slight delirium begins to appear, at first transient, perhaps only observed during the night, or on first awaking out of sleep; or in some cases the patient lies in a dozing 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 showing in some similar manner a confusion of thought, which has no resemblance to the delirium of fever. Sometimes he is sensible of it, and appears anxious to correct the mistakes which he has made. These symptoms are followed by a tendency to sleep, and this soon passes into coma. While these symptoms 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 acute sensibility, becoming dull and vacant, often with squinting and double vision; and these are often succeeded by dilated pupil and blindness, even before the patient falls into coma. The pulse, having continued slow for a day or two, sometimes only a few hours, begins to rise again, and rises to extreme frequency; it has been counted as high as two hundred in a 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 diseases, except from some temporary cause, and is, in all affections of the head, a symptom deserving much attention. The patient is now in a state of perfect coma, sometimes with paralysis of one or more of the limbs, sometimes with 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 in some cases drawn out to three weeks, and in others, 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, giving sanguine but deceitful hopes of recovery. This usually occurs when the pulse is falling in frequency, or when it is beginning to rise after the slowness, and it is generally the prelude to coma. In some cases the pulse does not become slow, but 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 which points out the alarming nature of the disease.

IV. The fourth form of the disease, 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, with general uneasiness of the limbs, impaired appetite, and disturbed sleep; 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; but, at our next visit, we are disappointed to find the patient complaining as much as at first. More active treatment is then adopted, and there is again an 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, but never quite gone; the pulse continuing 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 permanent than corresponds with the general symptoms of fever; that the tongue is becoming clean, the pulse coming down, and the appetite improving, while the headach continues, with an unwillingness to be disturbed, and a degree of oppression which is not accounted for by the degree of fever. In this manner the disease may go on for several days more, until, perhaps about the 12th or 14th day, the pulse suddenly falls to the natural standard, or below it, while the headach is increased, with an evident tendency to stupor. This instantly marks a head affection of the most dangerous character, and 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; sometimes the squinting goes off, and the eye appears quite natural, the stupor is lessened, and the patient appears easy and intelligent, but soon relapses into perfect coma, and dies in three or four days. The duration

of the disease 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 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 affection is probably ascribed. There is no urgent symptom, and no alarm is excited until, after eight or ten days, the pulse is found at 70 or 60, the pupil dilated, the eye fixed and vacant, and the child in a state of oppression tending to stupor ; these symptoms are soon followed by coma, generally with squinting, and in a few days by death.—This form of the disease might have been considered as a modification of the former, as the symptoms differ only in degree ; but I have thought it worthy of a separate description, on account of the insidious characters which it exhibits in the early stages, and because it is a form of very frequent occurrence. Cases indeed occur in which there is still less appearance of an affection of the head, than I have supposed in this description, and in which there is not even the slightest complaint of headach through the whole course of the disease.

V. The fifth form of the disease I have usually observed in adults ; and 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. Delirium frequently appears at an early period, varying in degree from day to day, until after five or six days it passes into fatal coma, the pulse having continued from 70 to 80 through the whole course of the disease. 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. The vision is in some cases not affected; in others squinting and double vision occur, and sometimes these symptoms, after continuing for 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: and frequently the patient lies in a dozing state, and talking incoherently, but out of which he can be roused, so as to talk sensibly. This condition, when it is not accompanied by fever, is always characteristic of a dangerous affection of the brain. There is also frequently observed that peculiar forgetfulness or confusion of thought formerly referred to, which is different from any thing that occurs in fever, and always indicates a dangerous cerebral disease. Sometimes, there is difficulty of articulation; and frequently a hesitation in speaking, from the patient not being able to recollect the word which he intended to make use of. There is generally towards the end more or less coma, which in some cases 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 death.

To these forms of the disease, other modifications might have been added, but it is impossible to include in any description, all the varieties in the symptoms. One variety has been added by M. Gendrin, which is worthy of attention. It comes on in a very insidious manner, at first often without either headach or fever. There is chiefly observed a certain obscuration of the mental functions, accompanied with lassitude and an appearance of mental depression. The patient seems scarcely to comprehend what is said to him,—asks the same questions several times in succession,—and answers questions put to him with slowness and hesitation. He complains of little unless a general feeling of being indisposed; and thus the symptoms creep on gradually with disturbed sleep, and slight rigors, till they pass

into slight delirium, and at last into coma; the pulse which was at first not affected, becoming rapid as the disease advances.

In all the forms of this dangerous affection, there is great variety in the symptoms, and much observation is required to put us fully upon our guard against the insidious characters which many of the cases assume, and the deceitful appearances of amendment which often take place in all the forms of the disease. Even in those cases 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 for several days, I have known a parent intimate to 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 perhaps is considered as favourable; it falls to the natural standard—he then sleeps almost constantly; and in another day this sleep terminates in coma. The pulse then begins to rise again; it rises to extreme frequency, and in a few days more the patient dies. All this may go on with very little complaint of headach, and without any symptom that will lead a superficial observer to suspect danger, until he finds his patient gliding 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 disease, 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 may have entirely subsided, and the complaint may again have assumed the characters of simple fever, we must not consider the danger as over, but must be upon our

guard against a period of anxiety which 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, and sometimes there is a remarkable tendency to sleep. Frequently something unusual may be observed in the patient's manner, such as a fretfulness or querulousness which is not natural to him, —a quick and hurried manner 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 hopeful state of recovery, while in fact his disease is advancing rapidly to a fatal termination.

In this description I have been entirely practical ; and I have not entered upon the inquiry, whether all the forms of disease which I have mentioned are to be considered as primary and idiopathic affections of the brain, or whether some of them ought to be looked upon as secondary or symptomatic. It is, however, an important fact, that this disorder does very often occur as a symptomatic affection in the course of other diseases ; the most common of which are,—continued fever,—scarlatina,—hooping cough,—measles,—pneumonia,—phthisis, and diseases of the kidnies. 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 and giddiness, especially if the pain be referred to a particular spot, and always to the same part, —tinnitus—sense of weight and fulness—

stupor—a great propensity to sleep. In many obscure and insidious cases, a constant feeling of giddiness is the only remarkable symptom.

In the Eye.—Impatience of light—unusual contraction or dilatation of the pupil—double vision—squinting—blindness—distortion of the eyes outwards—paralysis of the muscles of the eyelids, producing, according to the muscle that is affected, either the shut eye, or the gaping eye—transient attacks of blindness or double vision—objects seen that do not exist—a long-sighted person suddenly recovering ordinary vision.

In the Ear.—Transient attacks of deafness—great noise in the ears—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 even part of a limb; and a state of rigid contraction of particular limbs.

In the Organs of Touch.—Diminution or loss of sensation in a limb, or often in a very small part of a limb,—and various morbid conditions of sensation.

In the Urine.—There frequently occurs a remarkable diminution of the secretion—sometimes nearly amounting to complete suppression; and connected with this diminution there is often a frequent desire to pass urine, occasioned probably by the increased acrimony, as the quantity diminishes.

In this important diagnosis, however, minute attention to the correspondence of the symptoms is of more importance than any particular symptom; 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.

In the preceding outline, the symptoms have been described from the cases of most frequent occurrence. We meet with numerous varieties which it is impossible to include under any general description. One of the most remarkable modifications is that which comes on with a sudden attack of palsy, so as to be considered as an apoplectic rather than an inflammatory affection; it is generally connected with inflammation of a portion of the cerebral substance, but may also occur in connexion with inflammation of the membranes. This form of the disease may also take place in a more chronic manner, in which it goes on for months. In such cases, it is generally distinguished by headach, often confined to one side of the head—loss of memory—affections of various organs, as the eye, the ear, or the tongue—convulsive affections—palsy of one limb, or one side of the body, and at last ends by coma and death. In such case ramollissement of a part of the

brain is generally met with, but sometimes the part is found of a dark red colour, and rather firmer than the surrounding parts.

In the particular symptoms likewise, numerous varieties occur, as, for example, in the state of the pupil: in some cases it continues sensible to the last, and in others it is unusually contracted; sometimes, after being dilated and insensible, it again becomes sensible; occasionally one pupil is found to contract, while the other is dilated and insensible. Alternate contraction and dilatation may also be observed; and a singular condition of the pupil is sometimes met with, in which it becomes dilated on the approach of a bright light. I have observed this several times, and am quite satisfied of the fact, but am unable to point out the particular nature of the cases in which it occurs. It will be found exemplified in one of the cases to be afterwards described. Remarkable recoveries of the senses also occur, often a short time before death. Some time ago I saw a boy aged seven, who had perfect blindness and loss of hearing, followed by coma; three days after the occurrence of these symptoms, he recovered his sight and hearing for a few hours, knew those about him, and talked sensibly; then relapsed into coma, and died next day. The usual appearances were found on dissection, the effusion being in large quantity. I have also seen squinting continue for a day or two, and then disappear, the disease running its course to a fatal termination without any recurrence of it.

In the preceding observations I have said little in regard to the state of the bowels, because I am satisfied that there is no condition of them which is peculiar or essential to this class of diseases. They are generally obstinate, but sometimes easily regulated, and sometimes spontaneously loose through the whole course of the disease. The motions also vary exceedingly in character, exhibiting in different cases, and at different periods of the same case, all the various forms of morbid appearance, which are met with in other febrile diseases

One of the most common is the evacuation of much green matter like tea-leaves, or chopped spinage; and this, I believe, is the appearance which has been considered so peculiar to affections of the brain, as to have received the name of hydrocephalic stools. This doctrine, I am satisfied, is entirely unfounded in point of fact, and therefore, when it is proposed as a rule of diagnosis, I must consider it as highly dangerous. Every practitioner who divests himself of system, and attends to what is passing before him, will find, that the character of stools here referred to, is by no means peculiar to affections of the brain; and, that hydrocephalus runs its course with every possible variety in the appearance of the evacuations, and that even at the most advanced periods of the disease, they may often be found perfectly natural. While it is therefore proper that, in the investigation of this disease, every attention shall be paid to the character of the evacuations, and every means used to correct them when they are morbid, I must consider it as erroneous in principle, and in practice dangerous, to suppose that any particular character of stools is characteristic of hydrocephalus.

SECTION II.

OF THE PRINCIPAL SEATS AND TERMINATIONS OF THE DISEASE.

The preceding outline will serve as a general view of the symptoms, which indicate inflammatory action of some of the parts within the head. When we come to investigate this class of diseases in a pathological point of view, they resolve themselves into important varieties, arising probably from the particular part which is the primary seat of the disease; and important modifications depending upon the manner in which the inflammation terminates.

The varieties in the *seat* of the inflammation may be referred to the following heads.

I. The Dura Mater.

II. The Pia Mater and the Arachnoid. These may be taken together, both because it is extremely difficult to distinguish inflammation of the Pia Mater from inflammation of the Arachnoid, and because, in point of fact, they seem in general to be affected at the same time.

III. The substance of the Hemispheres.

IV. The dense white matter forming the central parts of the brain,—the septum lucidum, the fornix, and the corpus callosum.

To investigate the phenomena connected with these various seats of disease, will be one of the objects of the following dissertations; and at the same time it will be of consequence to keep in view the peculiarities arising from the modes in which the inflammation terminates. These are chiefly the following. The disease may be fatal,

I. *In the Inflammatory Stage,* and this may occur, whether it be seated in the substance of the brain, or in the membranes, especially the Pia Mater. In the most distinctly marked cases, however, of this termination, the inflammation is found in the substance of the hemispheres.

II. *By Serous Effusion.* In the earlier investigations of this class of diseases, too much importance was perhaps attached to the effusion, as if it alone constituted the disease called acute hydrocephalus. The symptoms were ascribed to the compressing influence of the effused fluid, and the practice was directed chiefly or entirely to promoting its absorption. It is now, I imagine, very generally admitted, that the effusion in acute hydrocephalus is to be considered as one of the terminations of inflammatory action, though there are certainly other causes, from which serous effusion in those parts may arise.

Increased effusion from a serous membrane, appears to take place under two very different conditions of the part:—

(1.) Inflammation of the membrane itself, or of the parts immediately adjacent to it. In this manner we see effusion take place in the cavities of the Pleura, and the Peritonæum, from inflammation of these membranes. The effusion in such cases varies considerably in its character, being in some cases limpid, in others opaque and milky, and in others mixed with yellow flocculent matter, or sometimes being nearly purulent. It is difficult to say on what these varieties depend. We may perhaps be allowed to ascribe them in some degree to the seat of the inflammation, and to suppose that when the membrane itself is inflamed, the fluid will be flocculent; and that it will be limpid, when the inflammation is seated in the parts which the membrane covers, the serous vessels of the membrane being thus affected only in a secondary manner. We observe the same varieties in the appearance of the effused fluid in the brain, which we find in the other serous cavities; and upon the whole view of the pathology of the disease, we may consider the principle as fully established, that inflammatory action is the source of the effusion in all those acute affections of the brain, which have generally been included under the term Acute Hydrocephalus.

(2.) There is, however, another source of serous effusion entirely distinct from this, viz. interruption of the circulation in the veins in any part of the body. In this manner, we see a tightly bandaged limb become œdematous below the seat of the pressure, and we find anasarca of the whole or part of a limb produced by the pressure of tumours, and ascites arising from induration of the liver. Whenever such interruption occurs in the circulation of a vein, it appears that increased effusion takes place from the exhalant branches of those arteries with which the vein is more immediately connected, depending probably upon a state of congestion in these parts, which in its effects is nearly analogous to inflammation. Such a state of impeded circulation evidently takes place in the brain from a variety of causes; such as the pressure of tumours, chronic disease of the si-

nuses, tumours on the neck, certain diseases of the lungs and of the heart, and probably from that very remarkable condition of the brain to which I have proposed to give the name of simple apoplexy. From serous effusion produced by such causes as these, probably arise those affections which have been called CHRONIC HYDROCEPHALUS and SEROUS APOPLEXY.

In regard to its SEAT, the effusion of course varies in different cases. It is found in the ventricles,—under the arachnoid,—betwixt the arachnoid and dura mater; —and there is every reason to believe that it also takes place betwixt the dura mater and the bone, though the fluid effused in this situation escapes when the head is opened. It is occasionally met with in a cavity formed by the separation of the laminæ of the septum lucidum. Cases have been described in which the effusion was confined to one of the lateral ventricles. This I have not seen, and it is probable that it could only take place in consequence of the obliteration of the communicating opening. *In quantity*, the fluid varies from a few drams to eight or ten ounces, or more. As *to quality*, it is sometimes limpid, sometimes bloody, and sometimes turbid, containing shreds of flaky matter. In some cases it is seen in the ventricles exhibiting all the sensible qualities of pus. Generally, however, it seems to contain but a very small proportion of animal matter. In the experiments of Dr. Marcet, a thousand grains yielded less than two grains of animal matter, which consisted of muco-extractive with a trace of albumen. In other cases, however, it is coagulable, and the truth seems to be, that it varies exceedingly, both in the quantity and in the quality of the animal matter which is contained in it.

III. *By Deposition of False Membrane.*—This arises from inflammation of the membranous parts, and it may be found betwixt the bone and the dura mater, or betwixt the dura mater and the arachnoid. But the most common seat of it is under the arachnoid, where it is often found of great extent, communicating a yellow colour to a great part of the hemisphere. In some cases

it is found following the course of the arachnoid alone, or dipping slightly betwixt the convolutions by small triangular projections; in other cases, it follows entirely the course of the pia mater, producing complete adhesion of the convolutions to each other. It is occasionally found within the ventricles, covering the surface of the choroid plexus; and a very common seat of it is the upper surface of the tentorium.

IV. *By Suppuration.*—A thin uniform layer of puriform matter is often found under the arachnoid, and occasionally between the arachnoid and the dura mater, and between the dura mater and the bone. It is also met with in distinct small cavities formed by partial adhesions of the membranes to the bone or to each other, and it is occasionally found in the ventricles. But the principal seat of purulent matter is in the substance of the brain; and here either it is met with in distinct defined abscesses, lined by soft cysts, or an extensive portion of the cerebral substance is found in a broken down corrupted state, in which, without any well-defined cavity, pus is found mixed with the disorganized cerebral matter. The cerebellum is a frequent seat of abscesses, and they may be found of small size but well defined in the centre of any of the more minute parts, as in the medulla oblongata, or the pineal and pituitary glands. An example will be given of a well-defined abscess, no larger than a small bean in the substance of the corpus striatum.

V. *By Ramollissement.*—This is a disorganization or softening of the brain, which has now received that name, —a term adopted from the French to express the peculiar morbid appearance; and I retain the French name, to distinguish this very peculiar disease from slight degrees of softening of the substance of the brain, which are often met with, but which do not constitute this affection. It consists in a part of the cerebral substance being broken down into a soft pulpy mass, like thick cream, or custard,—retaining its natural colour, but having lost its cohesion and consistence. It differs entirely from suppuration, having neither the colour nor the

fetor of pus; but the white parts of the brain in which it is most commonly observed retain their pure milky whiteness. It may be found in any part of the brain; but the most common seat of it in my observations is the dense white matter forming the corpus callosum, fornix and septum lucidum. The septum is generally found in such cases perforated by a ragged irregular opening, and the fornix has either entirely lost both its figure and its consistence, or retains its figure while it is left untouched, but falls down into a soft pulpy mass, when the slightest attempt is made to raise it.

When I formerly endeavoured to contribute something to the pathology of this remarkable affection, I had no hesitation in considering it as one of the results of inflammation of the cerebral substance. Since that time, it has been investigated with much attention, by M. Rostan and other French pathologists, and a different view of the nature of the affection has been strongly contended for by these eminent individuals. They consider it as an affection of the brain entirely *sui generis,* and M. Rostan, in particular, seems to look upon it as a peculiar and primary disease of the brain, though he admits it is sometimes the result of inflammation.

From all the facts which are now before us, in regard to this interesting affection, I think we are enabled to arrive at the conclusion, that it occurs under two modifications which differ essentially from each other. In the cases of M. Rostan, the disorganization was observed chiefly in the external parts of the brain; it occurred almost entirely in very old people, few of his cases being under sixty years of age, many of them seventy, seventy-five, and eighty. It was found in connexion with attacks of a paralytic or apoplectic kind, many of them protracted; and was often found combined with extravasation of blood, or surrounding old apoplectic cysts. On the contrary, the affection, to which my observations have chiefly referred, was found chiefly in the dense central parts of the brain, the fornix, septum lucidum, and corpus callosum, or in the cerebral matter immediately surrounding the ventricles;

and occurred in persons of various ages, but chiefly in young people and in children. It took place in connexion with attacks of an acute character, chiefly the character of acute hydrocephalus; and it was in many cases distinctly combined with appearances of an inflammatory kind, such as deep redness of the cerebral matter surrounding it, suppuration bordering upon it, and deposition of false membrane in the membranous parts most nearly connected with it. We may even observe in different parts of the same diseased mass, one part in the state of ramollissement, another forming an abscess, while a third retains the characters of active inflammation, and probably exhibits, as we trace it from one extremity to the other, the inflamed state passing gradually into the state of softening. Remarkable examples of this will be given in the sequel, and another of a different nature, in which an opening in the septum lucidum produced by the ramollissement, was entirely surrounded by a ring of inflammation. This is the affection which I have endeavoured to investigate, and which I consider as one of primary importance in the pathology of acute affections of the brain, and upon the grounds now shortly referred to, I cannot hesitate to consider it as a result of inflammation.

When we compare the facts now alluded to, with the observations of M. Rostan and his friends, I think we may arrive at a principle by which the apparent difference may be reconciled. The principle to which I refer is, that this peculiar softening of the cerebral matter is analogous to gangrene in other parts of the body; and that like gangrene it may arise from two very different causes, inflammation, and failure of the circulation from disease of the arteries. The former I conceive to be the origin of the affection which I have described, and the latter to be the source of the appearances described by M. Rostan. If this doctrine be admitted, the difficulty is removed; and I do not see any good objection to it. Gangrene from inflammation is familiar to every one; and equally familiar, though very different in its

origin and concomitant symptoms, is gangrene from disease of the arteries of any particular part of the body. Ossification of the arteries of the brain to a very great extent is a common appearance in elderly people, and seems to be a very frequent source of apoplexy with extravasation of blood, at advanced periods of life. It appears extremely probable that it may be the source of that particular condition of a part of the brain which terminates in the ramollissement of M. Rostan, and indeed he distinctly points at this explanation of it. On the other hand, I am still disposed to contend, that the ramollissement of young persons, occurring in acute affections, and seated chiefly in the central parts, is one of the terminations of inflammation in that particular structure. I conceive it to be an affection of primary importance in the pathology of acute affections of the brain, and to mark a peculiar seat of the inflammation of very frequent occurrence. It is often combined with suppuration in other parts of the brain, and very often with effusion in the ventricles; but the peculiar interest of it is observed in those cases, in which it is the only morbid appearance, and in which it is sometimes of small extent. Of this some remarkable examples will be given in the sequel, in which the perforation of the septum lucidum, by softening of a part of its substance, and similar softening of the fornix, were the only morbid appearances in cases which were fatal with all usual symptoms of acute hydrocephalus.

VI. As terminations of the disease in a *chronic form*, we still have to remark thickening of the membranes, contraction and obliteration of the sinuses, caries of the bones, and some other affections of the external parts, which will be more particularly referred to in the sequel.

In the pathology of acute hydrocephalus, we may consider it as probable, or almost ascertained, that the serous effusion is only one of the terminations of that inflammatory condition of the brain, which is a great and leading object of attention in the pathology and the

treatment. Some of the other terminations are scarcely less frequent; particularly the ramollissement of the central parts; which is sometimes met with as the only morbid appearance, and is found combined with the effusion in a very large proportion of the ordinary cases of hydrocephalus. Other cases, in which the symptoms closely resemble those of hydrocephalus, will be found to terminate by the undefined suppuration, or by this combined with serous effusion, or with the ramollissement of the central parts. In fact, we do not often meet with any one of the terminations uncombined, and it is impossible to anticipate from the symptoms, in what manner the disease may terminate in any particular case. Serous effusion uncombined with any other morbid appearance, I have usually observed in that which I have described, as the fourth form of the disease, in which the symptoms are slow and insidious in their progress, and at no period exhibit much activity. In the cases of this kind in which the pain is more severe, and the symptoms are more violent, I have generally found either effusion combined with the ramollissement of the central parts, or undefined suppuration. In that which I have described as the second form of the disease, I have generally observed the encysted abscess or the deposition of false membrane between the arachnoid and pia mater. But these results are by no means uniform; and the ramollissement in particular may occur with very slight and insidious symptoms. The various terminations, indeed, are very often combined together, and all of them are generally combined with more or less of serous effusion. On what these varieties depend, is at present in a great measure matter of conjecture. There is some reason to believe, that the darker or cortical parts of the brain are the chief seats of suppuration, and that the inflammation of the more central white matter terminates chiefly by ramollissement. The disease is also greatly modified by the activity of the inflammation, depending probably upon the constitution of the patient. Thus, in some cases, we find it assum-

ing the highest characters of active inflammation; in others, consisting of the pure scrofulous inflammation with the lowest degree of activity; and in others, forming numerous modifications by which these two extreme forms pass one into another by almost insensible gradations. Without attempting any general conclusions on these points, I shall proceed to describe a selection of cases calculated to illustrate the various modifications of inflammation of the membranes and of the substance of the brain.

SECTION III.

INFLAMMATION OF THE DURA MATER.

IDIOPATHIC inflammation of the dura mater is a very uncommon affection; the following is the only distinctly marked case of it that has occurred to me.

CASE I. A lady aged 22, in the evening of 16th March 1820, was suddenly seized with severe pain in the left temple; I saw her for the first time on the following morning, when I found the pulse about 100, the tongue white and moist; some pain continued in the left temple, but it was not severe; and her whole appearance corresponded with that of mild continued fever, though with some characters of an affection of the brain. After general and topical bleeding, with purgatives, &c. she was very much relieved; she occasionally complained of pain in the head, but at other times was entirely free from it, and mentioned only a feeling of confusion. The pain when present was occasionally referred to the left temple, and at other times, was more general, extending over the upper part of the head. Amid these changes, the first week of the disease passed, with much of the character of continued fever; the tongue white, the pulse varying from 96 to 110, the nights sometimes quiet, and sometimes rest-

less. In the beginning of the second week, a swelling appeared in the left upper eyelid; her look was now more oppressed, the pulse varying from 96 to 120; the pain varying as before, sometimes a good deal complained of and sometimes quite gone; and one day she complained of acute pain in the right ear. On the 27th, she began to have severe shiverings, followed by heat and perspiration, for which an eminent physician ordered her the bark in large doses. For two days after this she seemed much better, the pulse from 90 to 96, and every symptom greatly relieved. The swelling on the left eyelid was punctured, and discharged a good deal of purulent matter; and a probe introduced by the opening passed to a great depth along the upper part of the orbit, where the bone in some places felt bare. On the evening of the 29th, she was seized with slight convulsion, but it soon subsided, and after it she seemed quite as well as on the two preceding days, all the previous symptoms being very much relieved. On the 30th, there was more complaint of headach, with an oppressed look, and the pulse varied exceedingly, being sometimes very rapid, and at other times a little above the natural standard. On the 31st, there was no particular change; she was quite intelligent, and all her senses were entire. When she was last visited about nine o'clock at night, she complained of some uneasiness across the crown of the head, but no other change was remarked in the symptoms. Between one and two in the morning, she was observed to be slightly incoherent, and soon after sunk into a state of lowness; did not speak, but seemed quite sensible, and died at three. Very slight delirium had been observed on a preceding night, about the 28th, and once she had complained of dimness of sight, but none of these symptoms had been again taken notice of.

Inspection. On raising the skull-cap a good deal of purulent matter escaped, which had been collected betwixt the bone and the dura mater. The space in which it had been contained was defined by an irregular elevated margin of adventitious membrane, by

which the dura mater had adhered to the bone, the included space being about the size of a crown piece: it was on the anterior part of the right hemisphere. The dura mater included within this space was depressed; its surface was in some places ulcerated, and in others black, but the membrane was quite entire, and the bone was sound. On raising the dura mater, the inner surface of this portion had the same irregular ulcerated appearance as the outer surface, and when held up to the light, the membrane at the part appeared to be in some places considerably thickened, in others very thin. The right hemisphere of the brain, over all that part of it which is usually exposed in the ordinary way of opening the head, was covered by a thin uniform layer of very thick purulent matter, spread over it with great equality, and this being removed, an extensive stratum of adventitious membrane was found under the arachnoid. It was irregular in thickness, being most remarkable on the anterior part of the hemisphere, and disappearing on the posterior part. It followed the course of the arachnoid, covering the openings of the convolutions, but not dipping between them. The pia mater betwixt the convolutions was highly vascular, but without any deposition. On cutting into the substance of the right hemisphere, the cerebral matter was to a slight depth of a dark livid colour, but without any change of structure. There was no effusion in the ventricles, and the brain in all other respects was quite healthy. The suppuration in the left orbit was confined to a cavity betwixt the orbit and the ball of the eye, without any disease of the bones, and without any internal disease on that side of the cranium.

In this remarkable case, the inflammation of the dura mater appears to have been the primary disease, though it was afterwards complicated with extensive inflammation of the arachnoid. The only case which I have met with in any degree analogous to it, is one which is mentioned by M. Fizeau, though it differs from it in being complicated with disease of the bone.* A boy

* Journal de Med. tom. xi. new series, p. 523.

aged 15, had a "*fluxion*" of the right cheek and pain of the teeth. After some days it ceased, and removed to the left side of the head, where it occupied entirely the eye and its dependencies. He then had irregular attacks of fever, with want of sleep and loss of appetite, and about the 7th day considerable delirium, frequently attempting to get out of bed. On the 8th day, the left eyelid was swelled so as to close the eye, and on raising it the eyeball appeared unusually prominent. He had nausea and severe headach, but was quite sensible, and the fever was moderate; some delirium occurred towards night, and the swelling extended beyond the eyelids over the forehead. On the 9th day, there was permanent delirium; on the 10th, coma and death. The left eyelid and the integuments of the left side of the forehead were imbued with purulent matter; the frontal bone was denuded and carious for a considerable space; the abscess penetrated the orbit, and pus was found in the upper and back part of it, where the bone was also denuded. The caries of the frontal bone occupied the whole thickness of it, and extended in length somewhat beyond the roots of the hairs, and transversely from the external orbitar process beyond the nose. The dura mater was detached and covered with pus over a space corresponding with the external disease, but it was not detached from the superior part of the vault of the orbit. The arachnoid was covered with purulent matter; there was very little fluid in the ventricles, and the brain in other respects was healthy.

The following case, described by M. Prathernon, is referred by M. Gendrin to the head of inflammation of the dura mater. A man aged 62, had violent pain in the upper part of the head, which suffered remissions. When he was first visited, this had continued five days;—there was then considerable torpor, with weakened memory, and some confusion of ideas, but no fever.—Under the usual treatment, the symptoms went on for a fortnight, with little change, unless that there were attacks of fever, and gradual loss of strength. The symptoms then assumed an intermitting character, and

were treated with quinine. This did not agree, but soon after, an improvement took place in all the symptoms: the pain was much diminished, the man was out of bed, recovered his appetite, and appeared to be in all respects better. A few days after this, he complained of extreme weakness, and suddenly expired. The whole duration of the case was about a month. On puncturing the dura mater, turbid fluid tinged with blood was discharged to the amount of about a pound, and there were some clots of blood lying on the surface of the brain and between the lobes. The dura mater was in some places thickened to the extent of two or three lines, especially at the part corresponding to the principal seat of the pain. Its inner surface was of a deep red colour, rugose and unequal, with adhesions to the arachnoid. The arachnoid also was thickened and opaque on the upper part of the hemispheres.

These are the only cases that I am acquainted with of idiopathic inflammation of the dura mater taking place in this manner; but the disease is frequently met with in another form. It occurs in connexion with affections of the ear and of the petrous portion of the temporal bone.

This insidious and highly dangerous affection generally begins with pain in the ear, and for some days may be considered merely as a common ear-ach. Sometimes discharge of matter takes place from the ear, which is expected to relieve the pain; but the pain continues or becomes more violent. The patient becomes oppressed and drowsy, then slightly delirious, often with shivering, and at last comatose. In other cases, there is no discharge of matter, but the patient, after complaining for a day or two 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. In other cases, again, the affection supervenes upon the sudden cessation of a purulent discharge from the ear, which perhaps had been of some standing; such as that which

often follows scarlatina. The sudden disappearance of the discharge in these cases, is followed by pain in the ear, this by languor and drowsiness, and in a few days by coma. The pulse is in some cases frequent, in others natural, and in others below the natural standard. The nature of this disease is illustrated by dissection. There is generally caries of the pars petrosa of the temporal bone, sometimes confined to a small spot of it. A portion of the dura mater corresponding to this part is inflamed and thickened, spungy, or ulcerated, and generally detached from the bone. Between it and the arachnoid, there is commonly a deposition either of purulent matter, or of false membrane, and this deposition sometimes extends along the tentorium. In some cases there is a superficial abscess of the brain itself, or of the cerebellum, often with effusion in the ventricles, and the other usual marks of general disease in the brain. Matter is also frequently found in the cells of the petrous portion, in the canals of the ear, and in the cavity of the tympanum, and sometimes it extends into the cells of the mastoid process.

This disease will be illustrated by the three following cases, the third of which is valuable from showing the disease in an intermediate stage of its progress, the fatal event having taken place from another affection.

Case II.—A gentleman aged 20, on the 20th January 1820 complained of violent toothach, seated in a tooth on the right side of the upper jaw. On the 21st, the pain extended into the ear, without any other symptom. On the 22d, the pain continued in the ear, and extended toward the temple. He lay in bed part of the day, but got up afterwards. Leeches were applied, and he took some laxative medicine, which he vomited, and he had afterwards repeated vomiting. On the 23d, the pain was more general over the head and across the forehead, with some vomiting, and in the evening he had shivering. In the night he became incoherent and delirious: he was then seen by a surgeon, who found him considerably incoherent, but complain-

ing of severe headach; the pulse 70 and of moderate strength. I saw him on the 24th; his pulse was then sixty, his face rather pale; the headach continued, and was chiefly referred to the forehead; his look was vacant; he answered questions distinctly when he was roused, but talked incoherently when his attention was not kept up. He was now treated by repeated general bleeding, which he bore well; cold applications, blistering, purgatives, &c. On the evening of the 24th, there was considerable shivering. On the 25th, there was less complaint of pain, but more incoherence, and a tendency to stupor, pulse from 60 to 70.—26th, Pulsè from 100 to 120.—27th, and 28th, Little change; answered questions when roused, but when not spoken to, lay either in an oppressed state, or talking incoherently; pulse varying from 96 to 120. On the 28th there was some discharge of fetid matter from the right ear. 29th, Constant incoherent talking, pulse 96, of good strength; the right eye was suffused, the ball of it appeared turgid and enlarged, and the corner was covered with a yellowish slough. In the course of this day, the mouth was at times observed to be drawn to the left side, especially when he was drinking. At night he began to sink, and died at five in the morning of the 30th.

Inspection.—There was some effusion under the arachnoid on both hemispheres; much effusion in the ventricles, and extensive ramollissement of the septum lucidum, the fornix, and the cerebral matter bordering upon both lateral ventricles. There was extensive caries of the right temporal bone; behind the ear on the thin part of the bone it was very dark-coloured; and the petrous portion was dark-coloured, very soft, and when cut into, discharged matter from its cancelli and from the cavity of the ear; the dura mater corresponding to the temporal bone, was much thickened. The part of it which lay anterior to the petrous portion was in a state of recent inflammation; the part behind the petrous portion was much thickened and spungy; and between it and the bone there was a deposition of thick purulent

matter. From this place the disease had spread along the tentorium, and over nearly the whole surface of the cerebellum, on almost every part of which there was a deposition of coagulable lymph, with thick flocculi of purulent matter; this was most abundant on the tentorium, and on the right and posterior parts of the cerebellum, and it was traced into the fourth ventricle. Under the cerebellum there was a considerable quantity of pus, and in its substance there was a small abscess in the posterior part betwixt the lobes.

Case III.—A girl aged 9, had been 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, from which she was not relieved, as formerly, when the discharge of matter took place, 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 on which the discharge took place, and found her affected with pain across the forehead, impatience of light, and some vomiting; her look was oppressed, and the pulse 84. Bloodletting, purging, blistering, and mercury, were employed without relief. On the second day, the pulse was 60; on the 3d, there was slight and transient delirium, a degree of stupor, and slight convulsions. 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 her forehead, and moaning from 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 day, 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.

Inspection.—A considerable quantity of colourless fluid was found in the ventricles of the brain. The

brain in other respects was 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 spungy, 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.

Case IV.—A young lady aged 15, had been liable, for six or seven years, to attacks of pain in the right ear, followed by discharge of matter, but she had been free from any of these attacks for some time previous to the illness which forms the subject of the following history. On the 25th of April 1822, she complained of cold shivering through the day, and in the evening had headach with pain in the right ear, and these symptoms continued on the following day. On the 28th, she was seen by Mr. Brown, who found her with quick pulse and foul tongue, severe pain in the ear, and slight headach. On the 29th, some discharge took place from the ear, but without relief of the pain, which continued with violence on the following day. On the 1st of May, the pain was somewhat abated in the ear, but had extended over the right side of the head; pulse frequent; general and topical blood-letting were employed with partial relief. I saw her on the 3d: the headach was then rather abated; the pulse was frequent and weak; she had a pale unhealthy aspect, and a look of oppression, bordering upon coma. The pain was chiefly referred to the parts above and behind the right ear, where the integuments were painful on pressure, and at one spot near the mastoid process, felt soft and elevated; a puncture was made at this place with a lancet, but nothing was discharged. Topical bleeding, blistering, &c., were recommended. (4th) Pulse in the morning 148, in the course of the day it fell to 84.—look of much languor and exhaustion. (5th) Dark-coloured

matter of intolerable fetor began to be discharged from the puncture which had been made behind the ear. The opening here was enlarged, and a probe being introduced, the bone was felt bare and rough over a considerable space ; headach much relieved, pulse natural. (6th) Great discharge from the opening, headach much relieved, pulse 112 ; complained of some pain in the left side of the thorax, and there was considerable diarrhœa. (7th) No headach; there was much discharge of fetid matter from the opening near the mastoid process, and a probe introduced by it, passed backwards and downwards under the integuments of the neck as far as the spine. (8th) Pain in the thorax continued, and was now so urgent that a small bleeding was employed with partial relief; it could not be carried farther on account of her increasing weakness—pulse 140. (9th) Said she felt better, and made no complaint of pain—pulse very rapid, and strength sinking—died on the 10th.

Inspection.—Every part of the brain was in the most healthy state, except a small portion on the right side near the ear, which was of a dark leaden colour; the tinge, however, was found to be entirely superficial. The right temporal bone, externally, was bare through a great part of its extent; internally, it was in many places rough and dark-coloured, and there was some dark-coloured matter betwixt it and the dura mater. The dura mater at this place was for a considerable space thickened, spungy, and irregular; the coats of the right lateral sinus were considerably thickened through its whole extent, and the capacity of the sinus was very much diminished, by a deposition similar to that which occurs in the cavity of an aneurism. The internal ear contained dark-coloured matter. The left cavity of the pleura contained fully a pound of puriform fluid ; the left lung was collapsed, dense, dark-coloured, and covered by a coating of coagulable lymph.

These examples will be sufficient to illustrate this insidious and dangerous affection ; several analogous cases are mentioned by Itard, but they do not present

any important varieties in the phenomena. One of them was complicated with extensive swelling of the parotid, and the side of the face; there was deep-seated lancinating pain in both ears, and the case was fatal by coma in eight days. There was much purulent matter in the internal ear and in the Eustachian tube, with inflammation and thickening of the dura mater, and copious deposition betwixt it and the bone.* The termination of this affection by coma is sometimes sudden and unexpected; I lately saw a gentleman, about seventy years of age, who had been keeping the house for a few days, on account of a dull uneasiness in one ear; it was referred to a space, which he defined by planting the points of his fingers round the ear, so as to include a space of about three inches in diameter. There was no constitutional disturbance, and no danger was apprehended, until one morning he was found in a state of perfect coma, and died in the afternoon. He was moribund when I saw him, and no examination of the body was obtained, the case being at a distance in the country. The affection may be also suddenly fatal without coma. A young man mentioned by Dr. Powel,† who had been liable to suppuration of the ear and deafness, was seized with deep-seated pain in the right ear without fever. Relief was obtained from opiates, but the pain continued, with a fetid discharge. On the 10th day of the disease, after a violent paroxysm of pain, he sunk rapidly and died. The pars petrosa was found black and carious; the dura mater corresponding to it was black, sloughy, and separated from the bone; and under the dura mater there was a collection of pus and coagulable lymph, amounting to several ounces, which covered the whole superior surface of the right hemisphere. Mr. Parkinson‡ mentions a boy, aged fourteen, who had been affected for two months with headach, and discharge of matter from the right ear; a week be-

* Itard, Traité des Maladies de l'Oreille.
† Transactions of the College of Physicians, vol. v.
‡ London Medical Repository, March 1817.

fore his death the pain increased, and was accompanied by great debility, giddiness, and some vomiting. He continued in this state without stupor, or any other remarkable symptom, until the day of his death, when he was suddenly seized with convulsions, and died. 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, with effusion in the ventricles to the extent of three ounces.

This affection occurs most frequently in persons who have shown a tendency to disease of the parts, by purulent discharges from the ear, or 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 fatally, by inflammation spreading to the dura mater.

The matter which is formed in these affections, whether it be 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; and in this way alarming symptoms are sometimes unexpectedly relieved. The relief indeed is in general but temporary: the patient continues liable to pain, followed by discharges from the ear, and at last dies comatose, often with gradual abolition of the faculties, tremors or general convulsions. In some cases of this kind, there is reason to believe that a communication had existed for a length of time betwixt the ear and a diseased cavity within the cranium, and that the discharge thus afforded to the matter from time to time had retarded the fatal event. In a boy, mentioned by Mr. Brodie, there was in the left hemisphere of the brain a cyst about three inches in diameter, containing thick dark-coloured pus; the lower part of it rested upon the petrous portion of the temporal bone and there was an opening through the cyst, dura mater

and bone, forming a free communication betwixt the cavity of the abscess and the meatus auditorius externus.* Examples, indeed, have occurred which would lead us to suppose, that in some such cases the relief is permanent. A young lady in Edinburgh, several years ago, after the usual symptoms in the head, had lain for three or four days in a state of perfect coma, and her situation was considered as entirely hopeless. Her medical attendants, paying their visit as a matter of form, were astonished to find her one day sitting up and free from complaint; a copious discharge of matter had taken place from the ear with immediate relief, and she continued in good health. It is, however, by no means certain, that in such a case as this the discharge came from the cavity of the cranium; for there is reason to believe, that extensive suppuration within the cavity of the tympanum is capable of producing symptoms of great urgency, especially if there should be any difficulty of finding an outlet. In a case of this kind by Itard, the matter, after urgent symptoms, escaped by the Eustachian tube, and, by constantly dropping down in that direction, produced cough and great irritation of the larynx; after partial relief in this manner, the symptoms in the head and in the ear returned, and were at length relieved by the puncture of the membrana tympani.

A disease, analogous to that now described, sometimes occurs in the nose. A person who has been liable to pain in the forehead, and purulent discharge from the nose, 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 deposition of pus betwixt it and the brain, sometimes an abscess in the brain itself. Several cases of this kind are mentioned by Lieutaud and Bonetus. Morgagni mentions a priest who, after being affected with fever, delirium, pain in the forehead, and convul-

* Transactions of a Society for the Improvement of Medical and Surgical Knowledge, vol. iii.

sions, fell into coma, from which he was relieved by discharging purulent matter from the nose. A similar case, in a girl of fourteen, is mentioned by Mangetus. We are not, however, to conclude with certainty that in these cases, the discharge of matter was from the cranium, as violent symptoms of the same kind have been known to occur from suppuration in the frontal sinus. This generally discharges itself by the nose, and the cases do well; but a case is related by Richter,* in which a suppuration within the frontal sinus burst into the cavity of the cranium and was fatal. In other cases it makes its way outwards through the frontal bone, leaving a fistulous opening, which continues to discharge matter for a considerable time before it heals. Some cases are also on record, in which worms in the frontal sinus were the source of alarming symptoms, which were relieved by the discharge of them.† In one of these, by M. Littre, there were violent convulsions. Dr. Bright has described a case in which the lining membrane of both frontal sinuses was extensively ulcerated, and an opening had taken place from the left into the cavity of the cranium. The case was complicated with abscess in the anterior part of the left hemisphere, but the symptoms seem to have been very obscure,—being chiefly those of continued fever, during recovery from which there was discharge of blood and pus from the nose. This was followed by symptoms of cerebral disease, ending in coma.

It is foreign to my plan to enter upon those important cases, in which the dura mater becomes inflamed in connexion with disease of the bone, arising from external injuries. But such disease may arise in any part of the bones of the cranium without external injury, and may be productive of symptoms analogous to those already mentioned. Some years ago, a remarkable case

* Observat. Chir. Fas. 2d.

† See Hill's Cases in Surgery, and Hist. de l'Acad. de Science for 1708–33.

of this kind occurred in Edinburgh in a middle aged man, who, after a short illness, died in a state of coma. In opening the 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 on the left eyebrow, eyelids, and cheek. After several days, the swelling suppurated and discharged much matter, and the left eye was found to be blind; after a few days more, she was seized with convulsions, and died comatose. 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 injury of the ball itself; internally there was an extensive collection of matter, which communicated freely with the cavity of the orbit.

In some cases of this kind, the trephine has been applied with success; and they have shewn what extent of disease within the cranium may be recovered from, when a free outlet is given to the matter. Morand mentions a monk who had been for some time affected with discharge of matter from the right ear, with violent pain extending over the whole right side of the head. A tumour formed behind the ear, extending towards the temple, which, being opened, was found to be an abscess, and a probe could be passed from it, through a carious opening, into the cavity of the cranium. The trephine was applied at this place, and discovered a suppurating cavity within the cranium, which discharged a tea-cupful of matter; the discharge diminished gradually, and the sore was healed in two months.* M. Roux describes the case of a boy, aged thirteen, who, after a blow on the back part of the head, had a fistulous opening, which discharged matter for four years. He was liable to attacks of drowsiness and oppression in the head; and these were generally

* Morand Opuscules de Chirurgie.

relieved by copious discharges of matter from this opening, which was found to perforate the bone. After various treatment, the trephine was at length applied, when a small ragged opening was found in the dura mater, which led to a cavity under it, distinctly bounded by an adhesion between the dura mater and the arachnoid; it discharged at the first opening about three ounces of matter, and the case terminated favourably, the parts being healed in about two months.*

The dura mater appears to be much less liable to idiopathic inflammation than the other membranes of the brain. Various cases, however, are on record, in which it was affected to a considerable extent, without any disease of the bone. In a case of long-continued headach, mentioned by Pawius, which terminated by convulsions, 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 mentioned 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.

As a result of inflammation of the dura mater, a circumstance occurs in Case IV. which is worthy of notice, and which I think has hitherto been little attended to; I mean the obstruction of the lateral sinus. Of this affection, I add the following remarkable example, in which, though complicated also with disease of the bone, this affection of the sinus was the principal morbid appearance internally.

Case V.—A young lady, aged sixteen, (3d August, 1816,) complained of severe headach, which extended over the whole head. She had an oppressed look, and great heaviness of the eyes; pulse 120; the face rather pale. She had been liable to suppuration in the ears,

* Nouveau Journal de Médecine, tome xii.

and the left ear had been discharging matter for three weeks; she had complained of headach for a fortnight, and had been confined to bed for two days. Blood-letting, purgatives, blistering, &c. were employed on the third and fourth 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: eyes heavy, pupils a little dilated; bleeding from the temporal artery was employed, with purgatives, issue, &c. (7th.) Pulse in the morning 84, and in the evening 120; headach as before, with a dull vacant look. There was a buffy coat on the blood from the temporal artery. (8th and 9th.) Pulse from 120 to 140; severe pain of the back of the head and neck. (10th and 11th.) Pulse from 130 to 140, considerable stupor and occasional delirium, constant complaint of pain in the back of the head. (12th.) Increase of coma, but was sensible when roused; answered questions distinctly, and knew those about her until a few minutes before her death, which happened about mid-day.

Inspection.—The pia mater was highly vascular, as if minutely injected; the veins on the surface of the brain were turgid, and at one place on the posterior part there was a slight appearance of extravasation of 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 pus, 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 part the cavity was nearly obliterated. The disease extended into the torcular Herophili, and affected in some degree 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 about 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 por-

tion of the bone was extensively carious; the cells of it were everywhere full of purulent matter, and communicated freely with the cavity of the ear.

It may perhaps be doubted whether the remarkable disease of the lateral sinus which occured in Case IV. was a recent affection, and what influence it had in producing the symptoms in the fatal attack. Prichard found a similar affection of the sinus in a woman who had been epileptic for two years, and died in one of the fits without any previous change in her symptoms. He describes the left lateral sinus as being "through its whole length filled up by a substance very different from a recent coagulum, and apparently consisting of a deposition of lymph, which had become organized. It appeared so completely to occupy the calibre of the sinus, as to have entirely impeded the transit of blood through it." There was no other morbid appearance, excepting very slight effusion.* Dr. Bright found the lateral, cavernous, and petrosal sinuses of the left side, full of a dark ill-conditioned pus, which also filled the jugular vein, as far as its junction with the subclavian. The symptoms were pain in the ear, followed by much delirium, and extremely restless nights, and death after about three weeks. A few days before death, there was a copious discharge of unhealthy purulent matter, from the ear.

As the result of inflammatory action of a more slow and chronic kind, the dura mater is liable to thickening, and deposition of new matter betwixt its laminæ. The following case affords an example of a very remarkable disease which appears to have been produced in this manner.

Case VI.—A gentleman aged 60, had been liable for two years before his death to attacks of giddiness, accompanied by complete loss of all muscular power, in which, if not prevented, he fell to the ground. In

* Prichard on Diseases of the Nervous System, p. 175.

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 pain in the head, and giddiness, the attacks of which generally went off with vomiting. He was sound in his mind, but had considerably fallen off in flesh and strength; he felt an unsteadiness in walking which made him afraid of going alone; and, for some months before his death, he had perceived an increasing weakness of both his lower extremities. On the 1st of August 1816, he was attacked with hemiplegia of the left side, accompanied by headach and giddiness; the 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. Bloodletting and the other usual remedies had been employed. On the 19th, there was considerable headach; on the 20th, he became incoherent; and on the 21st, fell into perfect coma, with some convulsion. On the 22d, he was considerably recovered, so as to know those about him, and to answer questions rationally; but at night he relapsed into coma, and died on the 23d. For the last three days his pulse had been from 112 to 120.

Inspection.—Along the upper part of the right hemisphere of the brain, there lay a remarkable tumour five and a half inches long, two and a half broad, and about half an 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, especially about the centre of the tumour, it was more recent coagulable lymph, firm, yellow, and semi-transparent; and, at the anterior part, there was a cavity containing yellowish serous fluid. The tumour lay from before backwards, along the upper part of the hemisphere,—the inner edge of it being about an inch

from the falx; the dura mater all around it was considerably thickened, as were also the coats of the longitudinal sinus. The surface of the brain, where the tumour lay, was so depressed as to retain an impression of its figure; and, on the anterior part of the brain, the substance was considerably softened, with some appearance of suppuration. There was very little serous effusion, and no disease in any other part of the brain.

For the following very important case I am indebted to Mr. Adams of Banchory. It is distinctly referable to chronic inflammation of the dura mater;—and many of the circumstances of it are exceedingly remarkable, —particularly the absence of marked cerebral symptoms, and the prominent complaints being entirely referred to the stomach.

Case VII.—A gentleman of a cultivated mind, and an amateur painter by profession,—about 45 years of age,—had always enjoyed good health, except that latterly, he had suffered from ulceration of the tonsils. In the spring of the year 1829, being in London, he felt languid and depressed, owing, as was imagined by himself and his friends, to too ardent application to his professional pursuits; his sight became impaired, his stomach irritable, and he had various other symptoms which were referred to a morbid derangement of the hepatic system. After being treated for some time upon general principles, he came down to the country, towards the end of the month of June, in expectation that rural retirement would soon restore him to health. During the three succeeding months the principal symptoms of his complaint were,—a torpid state of the bowels, occasional vomiting, without nausea, sometimes, though rarely, dull headach, impaired sight, false vision, and ocular spectra. The spectral illusions generally consisted of fantastic female figures dancing around him; and, at one time, he had the impression of being attended by one of them wherever he went. He was always sensible, however, that they were unreal appear-

ances. He lost strength gradually, his stomach became more and more irritable, and he died on the 12th of October, excessively emaciated.

Inspection.—A portion of the dura mater, about three inches by two, immediately to the left of the falx, and a little anterior to its termination in the tentorium, was separated from the skull by a layer of coagulated lymph, imperfectly or not at all organized, and of a dull yellowish red appearance. This portion of the membrane was glued pretty firmly, by the same kind of matter, to the surface of the brain, there being no trace of pia mater or arachnoid visible. This part of the brain was much indurated, especially at one point anteriorly and to the left, where the induration extended to the depth of an inch and a half;—it adhered also to the falx, which was similarly diseased for nearly a square inch throughout its whole thickness; but did not adhere to the right hemisphere of the brain, or involve any part of it in the disease. The brain, in the immediate vicinity of this induration, was somewhat softened;—every other part of it was sound, except that there was about a tablespoonful of serum in the ventricles, and as much about the base of the skull. The stomach was not examined.

This case is a striking example of extensive cerebral disease with very obscure symptoms. It also tends to illustrate the nature of spectral illusions; and it is deserving of remark, as tending to illustrate the shape which these spectral appearances assumed, that about the time this gentleman became ill, his mind was intent upon making a drawing of one of the fanciful descriptions in *Moore's Epicurean*, and by the writer of this report, it was always supposed that the phantoms which seemed to sport before his eyes, bore some resemblance to those which had formerly occupied his imagination.

It remains to be mentioned, that no circumstance in his life was known to account for the diseased state of his brain, unless that, about three years before his death, he met with a fall upon a stair, whereby he hurt one of his knees seriously, and, as was suspected by

his relatives, also sustained some injury of the head. This explanation, however, is merely conjectural.

I have found nothing described by any writer precisely similar to these remarkable affections. The case most nearly resembling Case VI. in the symptoms, is one described by Lancisi.* The attacks in this case consisted of paroxysms, which appeared to be a mixture of syncope and apoplexy; sometimes accompanied with hemiplegia, and sometimes 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 period, and at these times accompanied by distortion of the neck to one side; she was likewise liable to attacks of vertigo and lipothymia, and died comatose. Similar cases are mentioned by Morgagni. A boy aged six, whose case is mentioned by Mr. Paisley,† was seized with pain on a particular spot on the left side of the head, followed by drowsiness, which proved fatal on the 12th day, with the usual symptoms of hydrocephalus. On the part corresponding to the seat of the original pain, there was a tumour the size of a large hazel nut, formed by a separation of the laminæ of the dura mater, and the deposition between them of a bloody serous fluid. There were several similar tumours, but of smaller size, along the course of the longitudinal sinus on the left side. Besides the fluid, the tumours contained a number of small white bodies like worms; at the places where the tumours were formed, the dura mater adhered very firmly to the membranes beneath. There was much effusion under the arachnoid and in the ventricles.

* Lancisi de Subitaneis Mortibus.
† Edinburgh Medical Essays, vol. iii.

SECTION IV.

INFLAMMATION OF THE ARACHNOID AND PIA MATER.

Inflammation of the arachnoid, and of the pia mater, may be taken together. It is very difficult to distinguish them in practice, and as the affections are generally combined, it is probable that no important purpose can be answered by attempts to discriminate between their symptoms. The disease terminates most commonly by a deposition of false membrane betwixt the arachnoid and the pia mater. When this is found to spread uniformly over the surface of the convolutions, we may suppose that it has been produced from the arachnoid; when it dips considerably between them, it is probable that the pia mater has been affected; but, in point of fact, it is very often remarked in these cases, that the pia mater presents a most intense degree of vascularity, even when there is no deposition betwixt the convolutions, while there is seldom any remarkable vascularity observed in the arachnoid. On this ground it has sometimes been doubted whether the arachnoid be really the seat of inflammation.

Some degree of this affection frequently accompanies other acute diseases of the brain, but we very often find it entirely uncombined, so that we are enabled to mark the symptoms more immediately connected with it. In these, however, there does not appear to be any uniformity. In some cases, it comes on with headach, vomiting, fever and impatience of light; but a frequent form in which the attack takes place, is by a sudden and long continued paroxysm of convulsion. This is in some cases preceded by headach and vomiting, but in other cases comes on without any warning. The convulsion is generally long and severe; in some cases, it passes immediately into coma, which afterwards al-

ternates only with a repetition of the convulsion, until in a few days the case is fatal. In other cases, there is recovery from the first convulsion, and the patient appears to be doing well for some time, perhaps for several days, but afterwards falls into coma, either with or without a recurrence of the convulsion. In other cases again, the convulsion does not come on till an advanced period of the disease.

The following selection of cases will illustrate the principal phenomena connected with this important affection, both in children and in adults. To prevent circumlocution, I shall employ the term *Meningitis* to express the disease, meaning thereby the inflammation of the arachnoid, or pia mater, or both, as distinct from inflammation of the dura mater.

§ I.—Simple meningitis in the most common form.

Case VIII.—A boy aged 11, had been for about a fortnight remarkably listless and inactive, and affected with frequent vomiting. The vomiting had occurred every day, or several times in the day; his bowels were costive, but he did not complain of any pain, and he was free from fever. In the evening of the 29th June, 1816, he was seized with violent convulsion, which recurred several times; in the intervals he had severe vomiting, and complained of headach; pulse 60. The convulsion occurred frequently during the following night, and in the intervals he complained that he could not see. Towards morning, the convulsion ceased, and left him in a state of the most profound coma. The coma continued till mid-day of 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 remedies 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; appearance much improved; ey 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 much of his head; afterwards fell into a degree of stupor; was sensible when roused, but was impatient of being disturbed, and still complained of his head; eyes natural; repeated vomiting.

6th.—Perfect coma, with frequent convulsion; pulse from 120 to 160; he frequently lay with the one hand pressing his forehead, and the other on the occiput.

7th.—In profound coma the whole day; died during the night.

Inspection.—On raising the dura mater, the surface of the brain in many places had a yellow appearance, which we found to arise from extensive deposition of adventitious membrane under the arachnoid. It was in general about the thickness of a wafer; some portions of it were thicker, and in some places masses of it of considerable extent lay between the convolutions. There was also a good deal between the hemispheres, which were partially glued together by it. The principal seats of this deposition were, the anterior part of both hemispheres, and the whole base of the brain, especially the depressions betwixt the lobes; and it also covered nearly the whole surface of the cerebellum. On the posterior part of the brain it was wanting, and there the pia mater was evidently inflamed. The surface of the brain, at these places, had also an inflamed appearance, but this did not penetrate into its substance. Some fluid was found in the base of the cranium, after the brain was removed, but there was no effusion in the ventricles, and the brain in other respects was healthy.

Case IX.—A girl, aged 9, awoke suddenly in the

night of 20th September, 1817, screaming from violent headach, and exclaiming that some person had given her a blow on the head.

21st.—She complained of pain in 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, the pulse quite natural. Continued in the same state on the 25th, and died on the 26th.

Inspection.—On removing the dura mater, the other membranes appeared highly vascular as if inflamed, except where this appearance was concealed by a layer of yellow adventitious membrane, spread out betwixt the arachnoid and the pia mater. This deposition 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. It was in general of the thickness of a wafer, and in some places extended downwards betwixt the convolutions. There was also a considerable quantity of it on the surface of the cerebellum. There was a good deal of gelatinous effusion about the optic nerves, and about an ounce of colourless fluid in the ventricles. The substance of the brain was throughout unusually vascular.

Case X.—A child aged 2 years, 21st May, 1826, was suddenly seized in the morning with severe and long continued convulsion. It left her in a dull and torpid state, in which she did not seem to recognise the persons about her. She had lain in this state for several hours, when the convulsion returned; and, during the following night, it recurred a third time, and was very severe and of long continuance. I saw her on the morning of the 23d, and while I was sitting by her, she was again attacked with severe and long continued

convulsion, which affected every part of the body, the face and the eyes in particular being frightfully distorted. The countenance was pale, and expressive of exhaustion, the pulse frequent; her bowels had been freely opened by medicine, previously prescribed by Dr. Beilby, and the motions were dark and unhealthy. Farther purging was employed, with topical bleeding, cold applications to the head, and blistering. After this attack, she continued free from convulsion till the afternoon of the 23d; in the interval she had remained in a partially comatose state, with frequent starting, pulse frequent, but feeble, pupil rather dilated; she took some food. In the afternoon of the 23d, the convulsion returned with great severity; and on the 24th, there was a constant succession of paroxysms during the whole day, with sinking of the vital powers; and she died early in the evening.

Inspection.—On removing the dura mater, the surface of the brain appeared in many places covered by a deposition of adventitious membrane, betwixt the arachnoid and pia mater. It was chiefly found above the openings between the convolutions, and in some places appeared to dip a little way between them. The arachnoid membrane when detached appeared to be healthy, but the pia mater was throughout in the highest state of vascularity, especially between the convolutions; and when the brain was cut vertically, the spaces between the convolutions were most strikingly marked by a bright line of vivid redness, produced by the inflamed membrane. There was no effusion in the ventricles, and no other morbid appearance.

§ II.—Meningitis of unusually great extent, with very obscure symptoms.

Case XI.—A child aged between 3 and 4, had scarlatina mildly in the milddle of June 1824, having been confined only four or five days. He had been down stairs for several days, and once or twice out of doors;

when, on the evening of the 23d, he became feverish, and complained of his bowels. After the operation of some laxative medicine he was much relieved on the 24th; his pulse, however, continued frequent. On the 25th, he again complained of his bowels, and was feverish; but in the evening he was again relieved, and no symptoms was remarked by Mr. White, except that his pulse continued slightly frequent, and at one time he complained of uneasiness in his eyes. In the night he was restless, but still complained only of his belly; his bowels had been freely moved, and the motions were natural. On the 26th, he had frequent vomiting, and in the evening became oppressed; pulse 120. I saw him for the first time at night. He was then in a state of oppression, evidently verging towards coma; could be roused, but without taking much notice of objects; pulse 120; countenance and eye natural. Topical bleeding, purgatives, cold applications, &c. were employed. In the night there was frequent vomiting, every medicine being brought up, and the bowels were not moved. On the 27th, the coma was increased, and there were through the day frequent convulsive affections of the face and arms; pulse 120, and weak; pupil dilated, and the eye insensible; died early in the morning of the 28th.

Inspection.—On removing the dura mater, the whole surface of the brain was found to be covered by a continued stratum of yellow adventitious membrane, deposited betwixt the arachnoid and pia mater. It was thickest above the openings between the convolutions; in many places, it was traced dipping between them to the depth of half an inch; and in some places, on the right side of the brain, it followed the course of the pia mater through the whole depth of the convolutions. The deposition was general over the whole brain, and on the upper and anterior parts of the cerebellum; and there was a good deal of it about the optic nerves. The pia mater and the arachnoid adhered everywhere very firmly together by means of it; when they were separated, the arachnoid presented no unusual appearance,

but the pia mater showed throughout the highest degree of vascularity; the deposition was entirely confined to the space between the membranes, for no vestige of it could be traced either on the outer surface of the arachnoid or the inner surface of the pia mater. There was no serous effusion, and the brain and the cerebellum were perfectly healthy; the bowels were in many places irregularly distended with flatus.

§ III.—Meningitis of very small extent, with severe symptoms.

Case XII.—A child aged 6 years, 24th January, 1822, had severe headach and some vomiting, followed by extreme obstinacy of the bowels, which resisted the most active medicines for six days. During this time, she complained constantly of headach, and the vomiting recurred from time to time, but was not severe, the pulse varying from 90 to 100. General and topical bleeding, with the most active purgatives and injections, had been employed with every possible assiduity by Dr. Hay. On the 6th day, the bowels began to yield, and about the 10th, there was a remarkable improvement of all the symptoms, pulse from 80 to 90, and the headach nearly gone. This favourable state continued for two days; the headach then returned, and on the following day, the 13th of the disease, considerable hesitation of speech was observed, with slight delirium occurring at intervals. On the 14th, she was in these respects better, but still complained of headach, which was referred to the forehead; pupils dilated; pulse frequent. On the 15th, slight convulsion was remarked several times through the day, and the pain of the forehead was still complained of. On the 16th, she was in the morning distinct and intelligent, but still complained of headach; pulse 120. Through the day, the pulse varied from 90 to 140, the pupil was dilated, and the vision imperfect, but she continued quite intelligent till eight o'clock in the evening; she was

then seized with severe convulsion, which continued without intermission for two hours, when she died. This very important case was most minutely attended to through its whole course, and all the usual remedies were employed in the most active manner.

Inspection.—There was no effusion in the ventricles, and every part of the brain presented the most healthy appearance, except a small part on the lower surface of the anterior lobe of the right hemisphere, where it lies over the orbit. There was, at this place, a distinct deposition of adventitious membrane of an extent scarcely larger than a shilling. Immediately connected with it, the substance of the brain was sensibly hardened, to an extent corresponding to the size of a large nut. No other disease could be discovered in any organ.

§ IV.—Meningitis of the base.

Case XIII.—A young lady, aged 14, was affected with symptoms resembling those of mild continued fever, which excited no alarm till about the end of the second week, when the headach became more severe, with some oppression and transient incoherence. I saw her, for the first time, in the beginning of the third week; there was then a degree of oppression, tending to coma; the pupil was dilated; pulse from 110 to 120; the tongue foul. For some days the symptoms varied considerably; sometimes shewing a degree of coma, but generally rather exhibiting the characters of typhus. The eyes, however, appeared to be insensible to the light, and once or twice a degree of squinting was observed, but it went off; sometimes she answered questions distinctly, and sometimes not; the pulse varied from 110 to 130. On the day before her death, she was much more sensible, and upon the whole considerably relieved; but next day she was more comatose, and her strength was sinking; and she died at night, about three weeks from the commencement of the disease. Several of the family had died of hydrocephalus.

Inspection.—The substance of the brain was healthy; the ventricles contained about two ounces of fluid; there was a considerable deposition of adventitious membrane on the surface of the Pons Varolii, which extended forward along the base of the brain; there was a good deal of it in a more recent state about the optic nerves, and it was traced upwards towards the third ventricle.

§ V.—Meningitis with suppuration on the surface.

Case XIV.—A child, aged 8 months, died 13th March 1818, of an illness which had continued more than three weeks. It began with fever, restlessness, and quick breathing; afterwards there were frequent 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 prominence of the anterior fontanelle; in the second week, this increased considerably; and in the third week, it was elevated into a distinct circumscribed tumour, which was soft and fluctuating,—and pressure upon it occasioned convulsion. It was opened by a small puncture, and discharged at first some purulent matter, afterwards bloody serum. No change took place in the symptoms, and the child died four days after.

Inspection.—The opening which had been made through the fontanelle, was found to lead to a deposition of thick flocculent matter mixed with pus, betwixt the dura mater and the arachnoid, and covering the surface of the brain to a considerable extent. There was a similar deposition between the arachnoid and the pia mater, which extended between the convolutions, and there was a good deal of it about the optic nerves and under the medulla oblongata; there was considerable effusion in the ventricles.

§ VI.—Meningitis with suppuration within the ventricles.

Case XV.—A child, aged 5 months, previously in perfect health, was seized with convulsion on the evening of the 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 employed that are usual in such affections. He continued well through the night; on the 22d, he was oppressed, with quick breathing, and in the afternoon, without any return of convulsion, he fell into a state of coma. This continued several hours, and then subsided, after topical bleeding, active purging, and the use of cold applications to the head. On the 23d, he was much relieved; eye natural; he took notice of objects, and was disposed to play, and no complaint was remarked, except occasional starting. On the 24th, he continued through the day in the same favourable state; but late at night he was seized with convulsion, which continued without intermission through the night, and he died early in the morning.

Inspection.—There was an extensive deposition of adventitious membrane betwixt the arachnoid and pia mater; 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 about 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 deposition about the optic nerves, under the base of the brain, and under the cerebellum. Below the medulla oblongata, there was a similar deposition mixed with some purulent matter.

There seems reason to believe that the arachnoid, lining the ventricles is more frequently the seat of in-

flammation than has been commonly supposed, in those cases which terminate either by simple effusion in the ventricles, or by the deposition there of a flocculent or puriform fluid. M. Gendrin has described several cases of this description, in which the lining membrane of the ventricles was much thickened; and one in which the posterior part of both ventricles was lined with false membrane, and their cavities filled with a milky fluid. The case was that of a girl of 13, weakened by a succession of abscesses; and it was complicated with meningitis in the ordinary form. The symptoms were pain in the left side of the head,—vomiting,—fever,—delirium,—palsy of the left arm, and contraction of the right,—and she died in a state of coma, in about five days. Dr. Bright has also described several cases in which the ventricles contained pus,—but they were not distinguished by any symptoms from the other inflammatory affections.

§ VII.—Meningitis of the cerebellum.

Case XVI.—A lady, aged 45, liable to suppuration of the left ear, complained of pain in that ear, May 11, 1821. On the two following days, the pain extended through the head, with fever; and on the 14th, she complained of general headach, and a violent and painful feeling of throbbing in the back part of the head. She was deaf and inclined to drowsiness, but quite sensible; pulse 120 and very strong; large bloodletting and the other usual remedies were actively employed on this and the following days by Dr. Thatcher and the late Mr. Bryce. I saw her on the 16th; there was then a good deal of coma, but she was sensible when roused; the eye natural, the tongue clean, pulse 130; she still complained of headach when she was closely questioned, but did not make any complaint except when she was much roused. The pulse being now considerably reduced in strength, topical bleeding only was employed. In the evening she was more easily

roused, and said she felt better; in the night, she became again extremely restless and incoherent, and died early in the morning. There had been a slight discharge of matter from the left ear early in the disease.

Inspection.—There was slight effusion in the lateral ventricles; the brain in other respects was healthy, On the outer surface of the cerebellum there was a uniform deposition of thick puriform matter; it was most abundant on the left side. The pia mater of the cerebellum was highly vascular, the dura mater was healthy; there was some purulent matter about the pituitary gland, and in the cavity of the ear, but there was no appearance of disease of the bones connected with the ear, or of the dura mater covering them.

Uncombined meningitis of the cerebellum seems to be an uncommon affection. An interesting example of it is mentioned by Mr. Duglison in the London Medical Repository. A boy aged 5, pale and delicate, after being slightly indisposed for four or five days, was seized in the night of 9th August with violent convulsion. On the 10th, there was fever with delirium; a vacant look of the eye, and an evident imperfection of vision, which appeared by his attempting to lay hold of objects that were presented to him, and missing them. There was dilated pupil, and slight strabismus. 11th, 12th, 13th, and 14th, Symptoms gradually increasing; 15th, coma; constant motion of the right arm and leg; the left appeared to be paralysed. In the night was seized with violent convulsion, which continued till his death; this took place on the morning of the 16th. The brain was healthy. There was a remarkable vascularity on the tuber annulare, forming a thick web of vessels. It was connected with the arachnoid coat of the right side of the cerebellum, which was thickened with some deposition of coagulable lymph. About ℥iv. of fluid was found in the base of the skull, but not above a tea-spoonful in the ventricles.

These cases will serve to illustrate the remarkable

diversity of symptoms which accompany this affection. I have selected them as calculated to exhibit the pure meningitis unconnected with any other considerable disease of the brain. The convulsive affections of children, which are apt to be indiscriminately ascribed to dentition, are, I think, frequently connected with this disease. In such cases, instead of the deposition of adventitious membrane, we frequently observe a thin but extensive coating of puriform fluid on the surface of the pia mater.

§ VIII.—A DANGEROUS MODIFICATION OF THE DISEASE WHICH SHOWS ONLY INCREASED VASCULARITY.

Another important modification of the disease occurs in an insidious and highly dangerous affection, which I think has been little attended to by writers on the diseases of the brain. It is apt to be mistaken for mania, or, in females, for a modification of hysteria; and in this manner the dangerous nature of it has sometimes been overlooked, until it proved rapidly and unexpectedly fatal. It sometimes commences with depression of spirits, which after a short time passes off very suddenly, and is at once succeeded by an unusual degree of cheerfulness, rapidly followed by maniacal excitement. In other cases, these preliminary stages are less remarkable; the affection, when it first excites attention, being in its more confirmed form. This is in general distinguished by remarkable quickness of manner, rapid incessant talking, and rambling from one subject to another, with obstinate watchfulness, and a small frequent pulse. Sometimes there is hallucination, or conception of persons or things which are not present, but in others this is entirely wanting. The progress of the affection is generally rapid; in some cases, it passes into convulsion and coma; but in general it is fatal by a sudden sinking of the vital powers, supervening upon the high excitement, without coma. The principal morbid appearance is a highly vascular state of the pia

mater, sometimes with very slight effusion betwixt it and the arachnoid. The disease is one of extreme danger, and does not in general admit of very active treatment. General bleeding is not borne well, and the treatment must in general be confined to topical bleeding with purgatives, antimonials, and the powerful application of cold to the head. The affection is most common in females of a delicate irritable habit, but also occurs in males, especially in those who have been addicted to intemperance. I have however seen it in one case, in a gentleman between 40 and 50, of stout make and very temperate habits. The cause of death is obscure; it seems in general to be a sudden sinking of the vital powers, supervening upon the high excitement without any of the actual results of inflammation.

Case XVII.—A lady, aged 23, had suffered much distress from the death of a sister, and had been affected, in consequence, with impaired appetite and want of sleep; this had gone on for about two months, when on the 4th of August 1825, she sent for Dr. Kellie, and said she wished to consult him about her stomach. He found her rambling from one subject to another with extreme rapidity and considerable incoherence; and on the 5th, she was in a state of the highest excitement, with incessant talking, alternating with screaming and singing; pulse from 80 to 90. In the evening she became suddenly calm and quite sensible after an opiate; continued so for an hour or more, then fell asleep, and after sleeping two hours, awoke in the same state of excitement as before. The same symptoms continued on the 6th; the pulse in the morning was little affected, but after this time it became small and very rapid. On the 7th, after a night of great and constant excitement, she had another lucid interval, but her pulse was now 150. The excitement soon returned, and continued till four in the afternoon, when she fell asleep. She awoke about eight, calm and collected, but with an evident tendency to coma; pulse

150, and small. She now took food and wine, and passed the night partly in a state of similar excitement, and partly comatose; and died about mid-day of the 8th, having continued to talk incoherently, but knowing those about her, and in general understanding what was said to her.

Inspection.—The only morbid appearance that could be discovered was a highly vascular state of the pia mater, with numerous red points in the substance of the brain.

Case XVIII.—A gentleman, aged 44, of a stout make, and very temperate habits, became suddenly affected, without any known cause, with extreme depression of spirits, accompanied by a good deal of talking and want of sleep. After this condition had continued for two days, it went off suddenly, and he recovered excellent spirits and talked cheerfully. This, however, was soon succeeded by a state of excitement, with rapid incoherent talking, and obstinate watchfulness; and the pulse rose rapidly to 160. This state continued without abatement for about four days, when he suddenly sunk into a state of collapse and died.

Inspection.—The only morbid appearance was a highly vascular state of the pia mater and arachnoid, with slight serous effusion betwixt them.

This obscure and dangerous affection is sometimes met with in connexion with other diseases, especially acute rheumatism and other inflammatory affections, and sometimes attacks females in the puerperal state. It is unnecessary to give a lengthened detail of cases, which do not tend to throw any additional light upon the nature of it. A young lady, whom I saw with Mr. Turner, had acute rheumatism in a very slight form for three days, her pulse from 90 to 96; on the fourth day, the pains ceased, and in the evening, she began to talk a great deal and rather incoherently, but made no complaint. On the fifth day, she was more tranquil, but at night the incoherent talking returned. I then saw

her for the first time; she was talking a great deal wildly and incoherently, but, when her attention was arrested, she answered questions distinctly; the pulse was 120; the tongue rather loaded, but moist; and she did not complain of any uneasiness. On the sixth day, these symptoms continued; in the evening she became comatose, and died in the night. Bloodletting was employed, and various other remedies, without benefit. A soldier, aged 34, for whose case I am indebted to the late Dr. Hennen, had acute rheumatism in a severe form, combined with pneumonic symptoms. He was relieved by bloodletting, but his pulse continued frequent, and he had some palpitation of the heart, but not severe. On the fifteenth day of the disease, he became suddenly comatose, and died in a few hours. In both these cases the appearances on dissection were altogether unsatisfactory.

The above remarks on this highly dangerous and interesting affection, I leave as they stood in the first edition of this work. Since that time I have seen several examples of it, and have been induced to adopt a different mode of treatment, which seems to promise some interesting results. Without at present venturing upon any general conclusions, I shall merely submit the following case.

Case XIX.—A lady, aged about 38, was recovering from her eleventh accouchment, when, at the end of a fortnight, she became affected with a deep-seated hard swelling in the right side of the pelvis, which was tender to the touch, and was accompanied by a considerable degree of fever. After repeated topical bleeding and other remedies, the febrile state subsided, the swelling lost its tenderness, and seemed to be gradually diminishing in size; but its progress was very slow, and, after three or four weeks, she was still confined to bed, and suffering a good deal of uneasiness; her pulse was now calm, but she was considerably reduced in strength. At this time, she became, one day, alarmed and agi-

tated by some family occurrence, and immediately began to talk wildly and incoherently, and after a restless night was found next day in a state of the highest excitement, talking incessantly, screaming and struggling, with a wild expression of countenance, and a small rapid pulse. She was treated by topical bleeding, laxatives, cold applications to the head, &c., but with little or no benefit; and on visiting her on the following day, I found her sitting up in bed, with a look of extreme wildness, both her hands in constant motion, talking incessantly and wildly; and I learnt that she had not ceased talking for one instant for the last twelve hours. Her pulse was now rapid and feeble, and her countenance expressive of exhaustion. In consultation with a highly intelligent friend who had charge of the case, I mentioned my experience of the fatal nature of the affection, and proposed to make trial of treatment by stimulants. A glass of wine was accordingly given, with evident abatement of the symptoms; and it was ordered to be repeated every hour. At the end of the fourth hour, she was perfectly composed and rational, her pulse about 90 and of good strength; and from this time there was no return of the symptoms. The tumor in the right side increased in size, suppurated, was opened and healed favourably. From this time she continued in perfect health, and has since passed through another accouchment in the most favourable manner.

This case I have given as another example of this interesting affection. I have employed the same mode of treatment, with similar benefit in several other cases, both of males and females. The chief difficulty is in deciding upon the particular cases to which the stimulating treatment is applicable. They appear to be those in which the excitement is accompanied by a small and rapid pulse, and an expression of paleness and exhaustion. When these characters are present, however violent the excitement may be, I have not been deterred from the practice, and in a considerable number of in-

stances have found much reason to be satisfied with it. I have tried it, but without the same benefit, in some of the common cases of insanity, accompanied by paleness and bodily weakness, but with a natural pulse. When there is frequent and strong pulse, with flushing and other marks of increased vascular action, it would of course be injurious.

An affection analogous to this occurs in habitual drunkards. The symptoms, in such cases, may either follow a particular instance of excess, or they may appear in connection with some incidental febrile disturbance produced by cold, or any other ordinary cause; and sometimes they follow slight injuries. There is generally great irritability and restlessness, with sleeplessness or disturbed sleep, sometimes delirium, almost amounting to mania: and generally a small rapid pulse. This state of excitement may either be followed by sudden sinking and death,—or it may pass into coma and be fatal more gradually. In other cases there is not the high delirium, but a febrile state of restlessness, passing into coma. On dissection, there is often little seen, except increased vascularity of the membranes, and some serous effusion under the arachnoid, and sometimes a little in the ventricles. In other cases a deposition of puriform matter is found under the arachnoid.

An affection occurs in children which presents the same obscurity in the morbid appearances as in these remarkable cases, though with different symptoms. The child is generally attacked with a succession of convulsions, and is cut off within various periods, from one to three or four days. It is apt to occur in connexion with other diseases, especially hooping cough.

Case XX.—A child, aged two and a half years, affected with hooping cough in a very mild form, was attacked, in the end of May 1822, with a convulsive

twisting of the hands, to which she had been formerly liable at an early period of life; this excited no alarm, till the 4th of June, when she was seized with general convulsion, accompanied with fever, headach, and an obstinate state of the bowels. All the usual remedies were employed with activity, but the convulsions continued to recur several times in the day, and she died on the 8th. The cough had gone on, but in a mild and favourable form.

Inspection.—There was slight increase of vascularity of the pia mater, with numerous red points throughout the medullary substance of the brain. No other disease could be discovered on the most careful examination, and all the other organs were healthy.

Case XXI.—A child, aged 5, affected with hooping cough, on 5th June 1822, was seized with headach and fever; had afterwards irregular motion of the eyes with occasional squinting, then violent convulsions, which recurred frequently and alternated with coma; and he died in three days. After death, nothing could be discovered, on the most careful examination, except increased vascularity of the pia mater in several places.

Case XXII.—A child, aged three years and a-half, had been for several days slightly feverish, with some cough, but the complaint was considered as trifling, and she was sitting at table on the evening of the third of April, when she suddenly lost her speech, and soon afterwards was seized with general convulsion. She continued in a state of constant and violent convulsion, with complete insensibility, for several hours; in the course of the night the convulsion abated—she recovered the power of swallowing, which had been lost, and took purgative medicine, which operated powerfully. On the 4th, the convulsion returned with great violence; she had a constant succession of paroxysms during the day, and in the intervals was in a state of coma. She died early on the 5th. On inspection, no disease could be discovered, except increased vasculari-

ty of the membranes of the brain, and turgidity of the veins upon the surface.

I have notes of several cases remembling this in the symptoms, and presenting the same obscurity in the morbid appearances. They occurred in strong healthy children from two to four years of age, and were fatal generally about the third day, and under various modes of treatment.

It is unnecessary to multiply examples of this kind, which only serve to shew us the imperfection of our knowledge on the pathology of the brain. In the following singular case, the affection here referred to seemed to have taken place in the course of another disease of the brain, and to have been the immediate cause of death, before the primary affection had been so far advanced as to have the nature of it distinctly characterized.

Case XXIII.—A child, aged 4 years, of a family who had lost many children from various forms of disease, had been affected for about ten or twelve days, with a feverish disorder, which had not shown any alarming symptom. The complaint appeared to be subsiding, and, on the day on which he died, he had been considered as convalescent by two medical men of the first eminence. In the afternoon of that day, his mother observed that his eyes became suddenly fixed and vacant. Soon after, he was seized with most violent general convulsion, which continued, without intermission, for about five hours, when he died.

Inspection.—There was considerable effusion in the ventricles, and a good deal of ramollissement of the septum and fornix. The only other morbid appearance was a most extensive and high degree of vascularity of the pia mater.

Inflammation of the arachnoid and pia mater appears to occur in a more chronic form, in which it may go

on for a considerable time, spreading from one part of the brain to another, and producing a succession of symptoms, as the parts become successively affected. A lady, mentioned by Mr. Howship,* had severe headach, impatience of light, and paralysis of the left arm and leg. 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 downwards upon the neck and back. She had then retention of urine, severe throbbing pain of the back and loins, convulsive contraction of the shoulders, and pain shooting through from the back to the breast. She had at last intense pain in the head, neck, back, and whole body, so as to be unable to move a single limb, and died gradually exhausted, four months after the commencement of the disease. On inspection, serous effusion was found under the arachnoid, with extensive deposition of coagulable lymph on the upper, lateral, and inferior parts of the brain, and the anterior part of the medulla oblongata: and the same disease was found to have extended along the membranes of the spinal cord.

Chronic disease of the pia mater and arachnoid is met with in various forms; in some cases, consisting of thickening of the membranes themselves; in others, with old depositions of false membrane; and in some, the affection is complicated with tubercular disease of the pia mater.

A gentleman mentioned by Dr. Powel,† after having been affected for a fortnight with slight headach, became incoherent, with a considerable degree of stupor, dilated pupils, and indistinct articulation; and he died in another fortnight. The pupil of the right eye was more dilated than that of the left, and, a short time before his death, the right side became paralytic. On inspection, effusion was found in the ventricles, and

* Howship's Practical Observations in Surgery and Morbid Anatomy.

† Transactions of the College of Physicians of London, vol. v.

deposition of coagulable lymph about the pons Varolii. At the anterior part of the middle lobe of the brain—he does not say in which hemisphere—the pia mater was much thickened, and its inner surface was studded with small tubercles, like large pin heads. Similar tubercles were observed in other parts of it, especially where it lies betwixt the convolutions. This tubercular disease of the pia mater does not appear to be a common affection, but a very remarkable case of it is mentioned by Dr. Clark.* A man, aged 35, addicted to intoxication, was seized with fever and cough, followed by vomiting, bloody stools, drowsiness, and muttering; but he was not entirely confined for the first fourteen days; after this he became worse, with severe headach, much cough, subsultus, drowsiness and deafness, pulse 116, tongue dry and brown. He had then delirium, impatience of light, and a degree of coma; but he was relieved by bleeding, and the pulse fell to 96. He died suddenly on the 24th day, having been out of bed and eating heartily the day before. On inspection, the dura mater was found perforated by small orifices, which transmitted flesh-coloured tubercles. These appeared to arise from the pia mater, and had no connexion with the brain; some of them were of the size of small peas, and were received into depressions of the cranium, some of which were one-sixth of an inch in depth. The arachnoid was thickened, and in some places adhered to the pia mater; in other places, coagulable lymph was deposited betwixt them; there was some fluid in the ventricles.

Thickening of the membranes, and adhesions to each other, are met with in many cases, probably the result of inflammatory action of old date. Such cases are mentioned by Wepfer, Willis, and others, in some of which the patients had been long liable to headach. Similar appearances have been observed in old maniacal cases. A man is mentioned by Dr. Powel, who had been two years insane, and died fatuous; he had

* Edinburgh Medical Journal, vol. v. p. 261.

been liable, at uncertain intervals, to convulsive attacks, in which the left side of the body suffered more than the right. An adventitious membrane of the thickness of three sheets of writing paper, was found covering the whole right hemisphere of the brain; it became thinner on the lower parts of it, and was gradually lost at the base; the left hemisphere was entirely healthy.

SECTION V.

INFLAMMATION OF THE SUBSTANCE OF THE HEMISPHERES.

In the symptoms accompanying inflammation of the substance of the brain, there are considerable varieties, depending probably on the extent of the disease, and the particular part of the brain which is the seat of it. We find in some cases, headach, followed by high delirium, and this by coma; in others, a sudden attack of convulsion. A frequent and very important form of the disease is characterized by headach, followed by convulsion of one or more limbs, the affected limbs afterwards becoming paralytic. Other cases again assume a close resemblance to the ordinary attack of hemiplegia, so as scarcely to be distinguished from it; and a very interesting feature of the affection in these cases is, that the disease in the brain may not have extended beyond the state of simple inflammation, though the symptoms have passed through their usual course, and have terminated in fatal coma.

In the progress of the disease, considerable modifications occur, arising from the various ways in which the inflammation terminates; in these we are chiefly to attend to the following varieties.

I. *It may be fatal in the inflammatory stage;*—a certain defined portion of the cerebral substance presenting the appearance of deep redness without any change of structure.

II. *The simple ramollissement;* which consists in a part of the brain being broken down into a soft pulpy mass, retaining the natural colour of the part, without any appearance of suppuration, and without fetor. This condition we often find as the only morbid appearance, but we frequently find it combined with the former, one portion of the diseased mass presenting the deep red colour, while another is in the state of ramollissement.

III. *The preceding appearance mixed with a proportion of purulent matter.*

IV. *The undefined suppuration.* This might perhaps be considered as a modification of the former, but with the purulent matter predominating in quantity. It presents a large ragged undefined cavity, filled partly with fetid purulent matter, and partly with broken down cerebral substance, the surrounding substance being soft and disorganized.

V. *The defined or encysted abscess.* This consists of a well defined regular cavity, filled with purulent matter, generally lined by a soft cyst, and surrounded by cerebral matter in a healthy state.

VI. *Ulceration of the surface of the brain.*

Important modifications also occur in connexion with the character of the disease in regard to activity. In particular, there appear to be some very interesting phenomena, connected with a chronic form of it, in which it may continue for a considerable time without advancing to a fatal termination, or in which the symptoms may remit so as to assume a periodical character. These various modifications will be illustrated by the following selection of cases.

§ I.—THE INFLAMMATION OF THE CEREBRAL SUBSTANCE FATAL IN THE INFLAMMATORY STAGE.

CASE XXIV.—A woman, aged 26, had laboured under bad health in a variety of forms for 18 months before her death. Her complaints began with severe headach, and frequent attacks of convulsion. After some time, these symptoms subsided, and she was seized with cough, hemoptysis, quick and laborious breathing, and scarcity of urine. The affection of her breathing came on in paroxysms, during which her respiration was 80 or 90 in a minute, and sometimes continued in this state for several days together, her pulse being 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; the paroxysms were succeeded by copious discharges of puriform fluid from the vagina; and 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 commencement of this attack.

Inspection.—I was present at the examination of the body, and 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 was principally observed in the upper and anterior parts of both hemispheres, and on the posterior part of the left hemisphere. The parts so affected

were rather 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 healthy, 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.

Case XXV.—A lady, aged 40, had been for some time affected with irregularity of the menstrual discharge, such as she supposed to be a prelude to its cessation. But, for some days previous to the attack to be now described, the discharge had been present, and very copious, so that she felt weakened by it. This continued on the 26th October 1825; and, in the evening of that day, on rising suddenly from her chair, she fell down on the floor in a state of syncope, but soon recovered, and felt no farther inconvenience. She passed rather a restless night, but without any particular symptom, except that early in the morning she complained of slight uneasiness in the back of her head. Soon after this, she was sitting up in bed taking her breakfast with appetite, when, without any warning, she fell backwards in a state of the most violent general convulsion, with every character of perfect epilepsy. The convulsion soon subsided, leaving her in a state of coma; after a short time, the fit returned, and, from 9 in the morning to 4 in the afternoon, she had about fifteen attacks of most severe and general convulsion, without ever recovering her senses in any degree between the attacks. During all this time, she was incapable of swallowing; the eye was insensible, and the pupil rather contracted; the face pale and sallow. The pulse varied exceedingly, being sometimes of good strength, and little increased in frequency; at other times, especially after the convulsion, it was frequent and feeble. General and topical bloodletting were employed with cold applications

to the head, &c.; and at 4 P.M. the convulsions ceased, leaving her in a state of coma, the pulse rather weak. The coma continued during the night, but in the morning of the 28th, she revived a little, began to swallow liquids, and seemed to take some notice of those about her. During the day, she generally lay with her eyes open, and at times appeared to follow objects with them, but showed little appearance of sensibility, except that once or twice she named her sister; pulse nearly of the natural standard, and rather weak. She took laxative medicine, by the operation of which she seemed to be relieved, but recovered no farther intelligence. In the night, the convulsions returned in a slighter degree than formerly, but were very frequent, sometimes occurring every 15 minutes.

(29th) She was in a state of coma, with appearance of exhaustion, incapable of swallowing, eye insensible, pupil natural, pulse feeble and of natural frequency; after mid-day, she recovered the power of swallowing, but soon lost it again. In the evening, the convulsions returned, with rapid failure of strength, and she died in the night. No paralytic symptom had been observed, and the convulsions seemed to affect equally the whole body.

Inspection.—A small quantity of fluid escaped in opening the dura mater. On the upper surface of the brain, there was a slight appearance of ecchymosis, forming three small patches. On cutting into the left hemisphere, there was found in the upper part of it a round defined portion of the cerebral substance of a dark red colour: it was about the size of a walnut, distinctly circumscribed, and surrounded by healthy cerebral substance. In its structure, it did not differ in firmness from the other parts of the brain; when cut across, it presented internally the appearance of innumerable small red points, interspersed with yellow points, but the red the most abundant. It was situated above the level of the ventricle, about the centre of the hemisphere; and, in the very same situation in the right hemisphere, there was another diseased part

exactly similar, except that it was a little softened in the centre. The brain in other respects was healthy, and there was no effusion in the ventricles. The arachnoid of the base was remarkably vascular on the right side; the cerebellum was healthy. In the centre of the medulla oblongata, there was a small dark portion, as if produced by a drop or two of extravasated blood. This remarkable case I saw along with the late Dr. George Wood.

The following case seems to be referable to this class, showing the disease in a stage somewhat more advanced with the first approach towards softening.

Case XXVI.—A gentleman aged 36, of very intemperate habits; had suffered repeated attacks of a nature allied to delirium tremens, but occasionally accompanied with symptoms of an apoplectic character. In October 1829, he had recently recovered from one of these attacks, and was in excellent health: went to the country, and was amusing himself with coursing, when, on the 6th November, he was affected with a slight epileptic fit. He had a second attack on the 7th, after which he became considerably incoherent in his conversation; and he had a third and more severe paroxysm on the 8th, in his carriage, on his way to Edinburgh. After the usual treatment, he was much better on the 9th, 10th, and 11th. On the 12th, he was excited and restless, walking frequently up and down stairs without any object; and in the evening he had a slight return of convulsion. On the 13th he was confined to bed, and was slightly incoherent. He was again attacked with convulsion at night. On the 14th he was more incoherent; and in the night had a very severe attack, in which he continued in a state of constant convulsion for several hours. Pulse frequent and weak. On his recovery from this paroxysm, he remained speechless and with a degree of paralysis of the right side; but he seemed to recognise those about him, and made attempts to express himself.—15th and 16th, continued in the

same condition.—17th, there was an increase of the paralysis and the pulse became more feeble. He now sunk into perfect coma and died on the 19th.

Inspection.—On raising the brain a very peculiar appearance was presented by the middle lobe of the left hemisphere, which was over its whole surface of a very deep dark red colour, nearly purple. On cutting into it, the same colour was found to extend through its substance, and in a slighter degree into the contiguous portions of the anterior and middle lobes, where it was gradually lost in the healthy texture. The part thus affected was sensibly softer than the sound cerebral substance, but not disorganized or broken down. There was some fluid found in the base of the skull, but the brain in other respects was entirely healthy.

§ II.—THE AFFECTION IN A CHRONIC FORM.

CASE XXVII.—A young lady, aged 22, was taken ill on the 20th of February 1817. 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. Bloodletting, 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 varying from 84 to 90. On the 11th, there was a violent paroxysm of headach followed by convulsion; she was again relieved by bleeding, but on the 15th, she had loss of recollection, much confusion of thought, difficulty of ar-

ticulation, and numbness of the right arm and right side of the face,—most remarkable in the latter, which had no feeling when it was touched. These symptoms disappeared on the following day, but 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, she was treated with arsenic, which 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 was at this time natural. From the beginning of May, the complaint began to diminish in violence; on the 20th, she was first 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 continued stationary for many months. During the summer and the following winter, she enjoyed tolerable health, but continued liable to headach, and throbbing in the head, and required the most cautious regimen. In spring, 1818, she had severe pectoral complaints, on recovering from which, she began again to complain of headach, with sense of weight in the head, and occasional giddiness. In the beginning of June, she had several attacks which resembled syncope, except that the pulse continued of good strength; and, soon after this, she began to be occasionally forgetful, and slightly incoherent. These symptoms were followed by a tendency to stupor, which was relieved for a time by purgatives, and repeated blistering; at this time, her pulse was generally from 96 to 100, and her countenance was pale and exhausted. As these symptoms advanced, her pectoral complaints disappeared, and, after various turns of the symptoms in the head, she was found speechless in the morning of the 3d of July. She lay with her eyes open, appeared to take notice of objects: pulse

from 90 to 100 and weak, face pale. She continued in the same state on the 4th; on the 5th, there was increase of coma, with loss of the power of swallowing, and paralysis of the right side.

(6th) Recovered the power of swallowing: pulse 130; expression of the countenance intelligent; eye natural; but she made no attempt to speak.

(7th) In the same state; took flowers in her left hand, and appeared to be amused by them; right side paralytic; great obstinacy of the bowels.

(9th) More oppressed. (10th) Perfect coma; pulse 130. She died in the evening.

Inspection.—The dura mater adhered intimately to the left hemisphere of the brain, at a spot the size of a half-crown piece, about the middle of the hemisphere near the falx. At this place a portion of the brain, the size of a large walnut, was externally of a deep red colour, and this redness appeared both on the upper surface, where the membranes adhered to it, and on the inner surface, where it was in contact with the falx. When cut into, this portion appeared rather firmer than the healthy cerebral substance, except towards the centre, where it was soft, as if approaching to suppuration. The external circumference of the portion retained the deep red colour, to the depth of about half an inch; the central parts were of an ash colour, with interspersed portions of a dark reddish-brown. On the upper surface, where the membranes adhered to it, there was a deposition of false membrane to the extent of the adhesion, and the dura mater, at the place of the adhesion, was thickened and spongy; the coats of the longitudinal sinus also appeared to be thickened, at the place where it came in contact with the diseased portion of the brain. There was no effusion in the ventricles, and no other disease in any part of the brain. The lungs were extensively tubercular, and the pleura lining the diaphragm, on the left side, was rough and irregular, from numerous small firm excrescences on its surface, resembling warts.

Case XXVIII.—A lady, aged 60, for whose case I am indebted to Dr. Hay, in the end of September, 1824, suffered an apoplectic attack with partial paralysis of the right side. She was relieved by bleeding, and appeared to be recovering favourably, until the 8th of October, when she had another attack. She did not then become insensible, but complained of a strong pulsation over the body, particularly on the right side, the arm and leg of which were again considerably paralysed. From this time, she gradually lost the power of these parts, first of the leg and then of the arm; she had occasional returns of the feeling of pulsation, and frequently applied her hand to the right side of her head, in which she said she felt uneasiness, and to which it was observed, that, during sleep, her hand was frequently carried; the bowels were extremely torpid. The usual treatment was employed by Dr. Hay, in the most judicious manner, without relief; her strength gradually declined, and she died on the 26th of December, having fallen into a comatose state, with loss of the power of swallowing, about a week before her death.

Inspection.—The dura mater was found to adhere very firmly to the brain, at a spot about the centre of the left hemisphere, on the upper part. The substance of the brain beneath this portion seemed firmer than natural, and when cut into, was of a bright red colour. This portion was about an inch and a half in extent downwards, and of nearly the same breadth; and the cerebral substance surrounding it appeared more vascular than the other parts of the brain. Deeper in the substance of the brain, a similar portion was met with, the size of a hazel nut, which was of a deeper red colour than the former. The corpus striatum of the same side was of a red colour, inclining to purple, soft in its texture, and presenting, when cut across, numerous points of vessels. The right hemisphere was healthy; there was a small quantity of fluid in the lateral ventricles; and, in both ventricles, the choroid plexus was

turgid with blood, and contained in its substance numerous small cysts of a bluish colour. The vessels on the surface of the left hemisphere, and betwixt the convolutions, were very turgid with blood; and, in some of the deeper convolutions, there was a slight appearance of ecchymosis.

§ III.—The inflamed mass passing into ramollissement.

Case XXIX.—A girl, aged 7, had been falling off for about two months before her death, having some cough, with considerable emaciation; but her appetite was good. On the 22d of July 1826, she had pain in the bowels, with diarrhœa, and some vomiting. These symptoms were relieved by the usual remedies, but she still complained of pain in her bowels, and had some cough. Three or four days after this, she complained of headach, and her speech was sensibly impaired; about this time, also, she complained of pain in the right ear. Some peculiarity of speech had been observed before on one or two occasions, when she was able to go about. On the 27th, she was first seen by Dr. Beilby, who found her affected with headach and pain of the ear; with considerable embarrassment of speech, and a small frequent pulse. On the two following days, she was considerably relieved in regard to pain, and the symptoms assumed more the character of continued fever. I saw her on the 30th, when there was considerable coma, so that she could scarcely be made to answer a question; pulse 90; the pupil much dilated, and there had been considerable return of headach. On the 31st, she was speechless, with nearly perfect coma; pulse 80. She continued in the same state on the 1st of August, with the pulse becoming frequent. On the 2d, she began to be affected with paroxysms of convulsions, which attacked only the right side of the body. The limbs of the left side appeared to be paralytic, or at least were never observed to move, even dur-

ing the convulsions of the right side. These paroxysms continued to recur for four or five days; she then sunk into a state of perfect coma, and died on the 10th. She had retained the power of swallowing liquids when they were put into her mouth, and seemed to recover a slight degree of motion of the left arm.

Inspection.—On removing the dura mater, several patches of false membrane were found on the outer side of the right hemisphere, chiefly at the openings of the convolutions, and dipping down considerably betwixt them. On cutting through this hemisphere, a defined portion was met with in a state of recent inflammation, presenting a uniform red colour, and a natural consistence. It was about 2½ inches in length, extending from before backwards, about an inch in breadth, and as much in thickness. At its interior part, it was connected with another portion, about an inch in extent in all its dimensions, in a state of perfect ramollissement, and of a yellowish white or ash colour; and the two structures evidently passed into each other, the inflamed portion becoming gradually softer as it approached the softened part. Along the whole of that part of the hemisphere, through which the inflamed mass extended, all the convolutions were firmly glued together through their whole extent, by a deposition of very firm adventitious membrane; and there was a similar adhesion of the anterior to the middle lobe. There was slight effusion in the ventricles, but the central parts were healthy. In various parts of the brain very minute tubercles were observed; and, on the base of the brain, at the junction of the left crus cerebri with the tuber annulare, there was an irregular tubercular mass of considerable extent, mixed with adventitious membrane. In the lungs there were numerous minute tubercles, all in a solid state. In the mucous membrane of the intestines, especially at the lower extremity of the ileum, there were observed numerous minute black spots, each of which, when viewed by a lens, appeared to be surrounded by a minute circle of inflammation.

Case XXX.—A lady, aged 24, had long been liable to severe attacks of headach, which occurred at irregular intervals, and were excited by various causes, such as warm rooms, and bodily exertions, and for which she had used a variety of treatment with little benefit. They had not, however, affected her general health, and she was recovering favourably from her second accouchement, under the care of Dr. Mackintosh, when, about the beginning of the second week, she was seized with severe headach, and considerable oppression. She was bled with relief, and continued tolerably well for several days, though with occasional complaint of headach. On Sunday, 14th January 1827, after a disturbed night, with some delirium, she complained in the course of the day of slight uneasiness in her head, and a peculiar feeling of numbness in the back of the head and neck; but she was otherwise well, and in good spirits, till about ten o'clock at night, when she suddenly complained of numbness and loss of power of the right hand. These feelings spread rapidly along the arm, which very soon became entirely paralytic, and this was speedily followed by loss of speech, and twisting of the mouth. She was immediately bled, and when I saw her soon after the bleeding, I found her with a look of intelligence, but without any attempt at speech; the pulse quick and feeble, the right arm entirely powerless, and with a degree of spasmodic rigidity. A few hours after, the right leg became also paralytic. She continued without any farther change till about three o'clock in the morning, when she was seized with severe and general convulsion, affecting both sides of the body, but strongest on the left side. The convulsion returned three times betwixt this and mid-day of the 15th, after which the attacks became much more frequent; and from this time she showed no appearance of sensibility. She had from the first swallowed with difficulty, but every attempt to make her swallow now excited general convulsion. During the attacks, the face was much distorted, and equally so on both sides; the limbs of the left side were violently convulsed,

while the right arm was affected chiefly with a rigid spasmodic contraction, and a tremulous motion. The convulsions now returned with great violence and frequency, sometimes every half hour, and each attack continued for ten or fifteen minutes. The pulse was generally rapid; sometimes extremely feeble, and sometimes of tolerable strength. The breathing was sometimes frequent and convulsive, and sometimes slow and oppressed, as if she were moribund; and on many occasions she was considered as being within a few minutes of death; but she continued to live in this state till the evening of the 16th, being forty eight hours from the attack. On the second day, the rigid contraction of the right arm had disappeared, and it continued entirely paralytic, except when it was affected by the convulsion.

Inspection.—On the upper surface of the left hemisphere, and between the convolutions, there was a considerable ecchymosis, produced by a very thin layer of extravasated blood betwixt the arachnoid and pia mater. The veins on the upper part of this hemisphere were remarkably turgid, and were found to be distended with dark blood in a perfectly firm fleshy state, mixed with some firm white matter; and their coats appeared to be thickened. Where these veins entered the longitudinal sinus, there was a remarkable diminution of its area, arising partly from the thickening of its coats, and partly from deposition of firm white matter on its inner surface. In the substance of the left hemisphere, about the centre of its long diameter, towards the outer side, and rather above the level of the ventricle, there was a distinctly defined portion about the size of a small walnut in a state of complete ramollissement, but retaining entirely the natural white colour; and immediately bordering upon this part, there was a considerable portion in a state of the deep redness described in the former cases; the brain in other respects was healthy, except a small softened spot in the right hemisphere.

This important case was also seen by the late Dr. Kellie, and Dr. Scott.

§ IV.—Extensive ramollissement of the corpus striatum.

Case XXXI.—A man, aged 25, about four years before his death was first affected with difficult breathing, strong action of the heart, dropsical symptoms, and irregular pulse; after some time he was considerably relieved, but about a year and a half after this he again became dropsical, and about this time was suddenly seized with palsy of the left side of the body, delirium and coma. The coma subsided in a few days, and he recovered the use of his limbs in a few weeks, so that he was able to return to his work as a joiner. The symptoms in his chest, however, soon obliged him to give it up, the strong action of the heart continuing, with small irregular pulse, and much dyspnœa. In May 1821, he was again attacked with palsy of the left side, accompanied by coma and delirium, and recovered in a few weeks. In these two attacks of palsy, there never had been any complaint of headach; but in March 1823, he was attacked with severe headach, followed by loss of memory, palsy of the left side, and coma. He again recovered in a few weeks, so as to be able to walk about; the symptoms in the thorax continued as before. 20th October 1823, he was a fourth time attacked with palsy of the left side, accompanied by violent pain referred to a particular spot on the coronal suture, a little to the right side. This was followed by maniacal delirium, the pulse feeble and irregular, the mouth twisted, and the left eye distorted. After some time he recovered considerably, so as to be able to walk with a little assistance, dragging his leg, but continued to be occasionally delirious till a few days before his death, when the palsy again became complete, with much delirium, and some convulsive affections, but no coma. He died on the 17th December.

Inspection.—There was nothing unusual on the surface of the brain, and no effusion in the ventricles. The right corpus striatum was externally of a peculiar dull yellow colour, and when cut into was found to be throughout its whole substance in the extreme state of ramollissement, extending to a great depth; this was mixed with a slight appearance of pus, and the soft undulating mass was separated from the ventricle by a delicate membrane. There was also ramollissement, but of small extent, in the left corpus striatum. The heart was generally and considerably enlarged; the right ventricle thickened; the left ventricle enlarged without thickening; the left auricle much enlarged, and containing a large organized polypus firmly attached to its sides, and deposited in successive layers like the deposition in the sac of an aneurism.

§ V.—The affection in a chronic form, with ramollissement of small extent, and remarkable symptoms.

Case XXXII.—A gentleman, aged 26, of a plethoric habit, had suffered occasionally for two or three years from headach and vertigo, which were always relieved by depletion. On 12th April 1827, while walking out, he was seized with confusion and giddiness, embarrassed speech, and a considerable degree of paralysis of the right leg. He was rather pale; his pulse was 70 and soft; and he did not complain of any headach. The usual treatment was adopted with activity by Dr. Combe of Leith, without much relief. On the contrary, after several days he began to complain of acute headach, accompanied by vomiting and hiccup; and the other symptoms continued nearly as before,—his speech being laboured and slow, and his memory very defective. After some weeks these symptoms subsided, so that he was able to walk out; but the headach continued with frequent vomiting. The pain was chiefly referred to the left side of the head, sometimes

to the occiput, and there was occasional numbness of the right arm. When I saw him, along with Dr. Combe and Dr. Kelly in July, his chief complaint was of frequent and irregular attacks of vomiting, occurring daily, or repeatedly during the day. It came on very suddenly, without previous nausea, and he was often awakened in the night by the sudden attack of vomiting. He had now a pale sickly look; there was no paralytic affection, and little complaint of headach; though he still had occasional uneasiness in the head, sometimes referred to one part of it and sometimes to another. When he did refer it to a particular part as the principal seat of the pain, it was either the left temple or the occiput. But the headach at this time was slight and transient, and the symptoms in the stomach were so much the more prominent, that it was a matter of much doubt whether there was now any fixed disease in the head. The vomiting was much relieved by the subnitrate of bismuth, so that he was free from it for several days. But it soon returned and went on as before, with increasing debility, great listlessness, and bad appetite; pulse little affected. He had now a peculiar unsteadiness of his limbs, so that on first getting up into a standing posture, he staggered very much and required some time and attention to steady himself. When he had accomplished this he walked with tolerable firmness. The symptoms went on in this manner till the 27th of October, when he was suddenly seized with violent and continued convulsion, and died in nine hours.

Inspection.—In the substance of the middle lobe of the left hemisphere of the brain, about the level of the lateral ventricle, there was a portion in a state of complete ramollissement, about an inch and a half in length, and an inch in its other dimensions, and the neighbouring parts appeared unusually vascular. The tuber annulare and pons Varolii were softer than usual, but otherwise healthy. No other morbid appearance could be discovered in the head, and all the other viscera were healthy.

It is unnecessary to point out the very remarkable features of this case. The sudden attack so closely resembling the ordinary paralytic attack, must have been connected with the commencement of the inflammatory stage. The remarkable symptoms in the stomach in the farther progress of the disease, and the mode of its termination, make it altogether a case of great value in the pathology of this remarkable affection. The following case shows the same morbid appearance, with a train of symptoms considerably different, but with a remarkable similarity in the mode of its termination.

Case XXXIII.—A gentleman, aged 38, during two years before his death had suffered several epileptic attacks, from which, however, he had always speedily recovered. On the morning of 27th December 1827, he was found in bed speechless and paralytic on the right side. He recovered his speech in the course of the day; the palsy continued in the usual manner, and after some time he began to recover a degree of motion of the parts. When he came to Edinburgh about a month after the attack, he had recovered the use of his leg so far as to be able to walk once or twice across his room with much exertion; his arm was improved in a much less degree; his speech was distinct, but his mouth was considerably distorted, and his mind was somewhat impaired. He now consulted Dr. Thomson, and under the usual treatment he was progressively improving, so that at the end of another month he could walk along the streets to a considerable distance, though with a dragging motion of his leg, and could nearly raise his arm to his head. In the evening of 22d February he went to a supper party, and seemed remarkably well; but departed considerably from the abstemious regimen to which he had been previously restricted. About 8 o'clock on the morning of the 23d he was found in bed in a state of complete insensibility, accompanied by severe and general convulsion, which was strongest in the limbs of the right side. The face was much convulsed, the eyes rolling and insensible, the respiration laborious and convulsive. Blood-letting

and the other usual means were actively employed without any relief. The convulsion continued unabated in the state now described, when I saw him at eleven, and he died at two.

Inspection.—The brain externally was healthy, except some old adhesion of the membranes near the posterior part of the falx, and very trifling effusion under the arachnoid. The ventricles contained the usual very small quantity of fluid. On the outer side of the left ventricle, and separated from it by a thin partition of healthy cerebral substance, there was a defined portion in a state of complete and diffluent ramollissement. The portion thus affected was about an inch in depth; about half or 3-4ths of an inch in diameter at the upper part, and became gradually narrower as it descended by the side of the ventricle, until it terminated almost in a point. There was considerable softening of part of the medulla oblongata, and the upper part of the spinal cord. No other vestige of disease could be discovered on the most careful examination.

I do not attempt to offer any explanation of the symptoms in these two most remarkable cases, or to reconcile them with the old notions in regard to diseases of the brain. I give them as facts carefully ascertained, and faithfully related, to be illustrated by farther observations on this very remarkable disease.

§ VI.—The affection in a chronic form, with extensive ramollissement, and remarkable disease of the basilar artery.

Case XXXIV.—A young man aged 18, had been for six or eight weeks affected with cough and pain of the chest, and was supposed to be phthisical; but for several days he had been much better, when on the 15th December 1819, he suddenly fell down deprived of sense and motion, and paralytic on the left side, with twisting of the mouth. When partially recovered, he complained of severe pain in the right temple; his

speech was very indistinct; countenance expressive of great stupor. The usual treatment was actively employed, but without much benefit, and he continued for about ten days with little or no improvement; the left side perfectly paralytic; a great degree of coma; the speech very indistinct; but he still pointed to the right temple as the seat of fixed uneasiness. During this time his pectoral complaints had disappeared. In January 1820, he began to improve, so as to have less uneasiness in his head, and considerable motion of the leg, but the arm continued entirely paralytic. His cough now returned, with considerable pain in the right side of the chest. He continued without farther change till the 15th of February, when he complained of pain in the back of his head, and was seized with loss of speech, and of the power of swallowing. He soon recovered his speech, but the power of swallowing was permanently lost, so that from this time he was constantly fed by liquids introduced into the stomach through an elastic gum tube. He was now quite distinct, and did not complain of any pain; the cough again abated; pulse of natural frequency but feeble. In the beginning of March he seemed to improve a little in strength, so that he was several times taken out in a carriage; there was considerable motion of the left leg, but the arm continued perfectly paralytic; no return of the power of swallowing; speech and intellect entire. He died rather suddenly on the 20th of March, having the day before become extremely weak and pale without any obvious cause.

Inspection.—On removing the dura mater, there appeared on the middle of the right hemisphere a remarkable depression, which, when cut into, was found to arise from an extensive mass of pure ramollissement; the part being in the state of a soft white pulp, without any appearance of pus, and without fetor; it extended the whole depth of the hemisphere. In the cerebral matter adjoining to this disease, there was a small abscess, no larger than a bean, lined with a firm soft cyst of coagulable lymph. There was very little effusion in

the ventricles, and no other disease in the substance of the brain. On raising the brain, a remarkable appearance was found in the basilar artery; through the extent of about an inch it was very much enlarged and hard, and this portion was found to be completely filled up by a firm white matter without any appearance of blood. Anterior to this portion, there was a small coagulum of blood in the artery. The lungs were tolerably healthy, but there was a considerable deposition of coagulable lymph, forming a thick firm mass betwixt the right lung and the pleura costalis at the lower part immediately above the diaphragm.

§ VII.—Ramollissement combined with suppuration.

Case XXXV.—A man, aged 24, had been liable for two years to headach, which was always referred to the right side of the head. In February 1818 he contracted syphilis, which being neglected, became inveterate, and continued fourteen months. During this time the headach became more severe, and was always referred to the right temple. In June 1819, he was affected with numbness of the left thumb, which gradually extended over the arm, and he had afterwards complete paralysis of the left arm and leg, with severe pain in the right temple. This was followed by maniacal delirium, which continued for three days. He was relieved by copious bleeding, &c. and was completely recovered within a month. In August, he was affected in the same manner, and again entirely recovered. He continued well till 27th November, when he complained of violent pain over the whole head, and in the night was observed to have lost his speech and the power of his left side; the jaws were locked; he appeared sensible, and expressed his feelings by signs; pulse 98, small and irregular. There was no change on the 28th; on the 29th, the body was rigid as if tetanic; he then became comatose, and died in the evening.

Inspection.—The anterior and lower part of the right hemisphere was extensively diseased, forming a mass in which softened cerebral matter was mixed with pus of intolerable fetor. There was very little fluid in the ventricles, and no other disease could be detected in any part of the brain.

§ VIII.—Undefined suppuration.

Case XXXVI.—A gentleman, 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 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 the year 1813.

May 14, 1813, after having been for some days languid, and complaining a little of his head, he was seized with severe headach and frequent vomiting. He was much oppressed, and lay in a dozing state, impatient of being disturbed; pulse 60. He was treated in the usual manner, by free, general, and topical bleeding, purgatives, blistering, &c. On the 15th the headach was still violent, but the vomiting had abated; pulse 60; had several severe attacks of shivering, was oppressed and disposed to sleep, but sensible; eyes natural. (16th,) Headach relieved; increasing oppression. From this time he lay in a state of partial stupor, with much talking, which was generally coherent; pulse varying from 80 to 120. He died on the 22d, rather unexpectedly, and without perfect coma. He had continued to know the persons about him till about twelve hours before his death. His sight continued natural except on the day of his death, when he appeared to be blind: no paralytic affection, and no convulsive symptom had been observed.

Inspection.—The right hemisphere of the brain, to about half its depth, was entirely reduced to a mass of fetid pus; in the centre, it was fluid, and towards the external parts, it was more of a pulpy consistence. In this mass, there were found some small coagula of blood, and the ventricles contained a considerable quantity of bloody fluid.

Case XXXVII.—A gentleman, aged 18, (10th July, 1815,) was affected with violent headach, extending along the upper and back parts of the head, and accompanied by severe pain in the neck, where it was much increased by the motion of the head. There was much oppression; pulse natural; face rather pale; tongue clean; eyes natural. He had been ill three days, and the complaint had commenced with shivering; he had been many years affected with deafness, and liable to suppuration of the ears. The usual practice was employed; general and topical blood-letting, purgatives, blistering, &c.

The bleeding gave great relief at each repetition of it, and the blood was sizy; 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, and at other times, was in violent pain; there was sometimes a degree of delirium, but it was slight and transient; there was much oppression but no coma, and no paralysis. He died on the 17th rather suddenly. At my last visit, he had raised himself in bed with little assistance, answered questions distinctly, and knew every person about him; pulse 60; sight natural. His death occurred a few minutes after I had left the house.

Inspection.—The whole of the posterior part of the left hemisphere of the brain was one mass of undefined suppuration. 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, and con-

siderable ramollissement of the fornix. In the substance of the brain, near the base, there was a small tumor 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 slight appearance of caries in the portion of the bone with which the diseased membrane was connected.

Dr. Bright has described a remarkable case, in which a mass of this kind of undefined suppuration occupied nearly the whole of the right hemisphere. The case began with puerperal convulsions, after which the patient lay for seven days, with very obscure symptoms, and sensible, till she died suddenly after violent convulsion.

§ IX.—Extensive undefined suppuration with extravasated blood.

Case XXXVIII.—A man, aged 40, had complained for two months of frequent pain and throbbing in the left side of his head. In March 1814, he began to be affected with convulsive motions in the right arm and leg, which attacked him in paroxysms, and usually continued about a minute, leaving him in the intervals able for his usual employment as a blacksmith. 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 considerable torpor of the right side. After some time, this was 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, the arm and leg became entirely paralytic. His speech was then affected, being first inarticulate, and afterwards gradually lost, so that after the middle of June he never was able to articulate a word. His pulse, which till this time

had continued quite natural, now became a little frequent; he passed his urine and feces involuntarily, but his mental faculties seemed to be entire. He took food when it was offered him, and put out his tongue when desired; his eye was natural, and the expression of his countenance intelligent. His sight and hearing appeared to be perfect, but he never attempted to speak. He often screamed as if 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.

Inspection.—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, there was about half an inch in thickness of sound cerebral substance, the remainder of the hemisphere was found nearly reduced to a fluid mass, partly consisting of purulent matter, and partly of cerebral substance, in a soft pulpy state; but the greater part was purulent. From this mass of disease, the ventricle was separated merely by the membrane which lines it, and contained a small quantity of serous fluid. In the substance of the left thalamus, there was a coagulum of blood, of the size of a walnut.

§ X.—The encysted abscess.

Case XXXIX.—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 headach was 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 16th and 17th, she was much relieved, the 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 being confined entirely to the head and the right arm. The head was drawn towards the right side with a rolling motion of the eyes, the arm was in constant and violent motion; she was sensible, and complained of headach; pulse 100. Being bled to ℥viii the convulsion ceased instantly, and the headach was relieved, but the right arm continued 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 convulsive attacks returned several times; they did not now affect the head or face, but were entirely confined to the right arm, which, after the 23d, was left in a state of permanent paralysis. Hitherto no other part of the body had been affected by the convulsion; but on the 24th, it attacked the right thigh and leg, and left them in a state of paralysis; pulse 60. The former remedies were again employed with activity, without any effect in arresting the progress of the disease. The thigh and leg now went through a course precisely similar to that described in regard to 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 whole right side; no return of convulsion; she continued quite sensible, and made little complaint; pulse from 50 to 60. She now continued for several days without any change, and except the palsy of the right side, every function was natural. She was quite sensible, appetite good, pulse and vision natural, and she made little complaint of any uneasiness. 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.

Inspection.—In the upper part of the left hemisphere of the brain, there were two distinct defined abscesses, containing together from six to eight ounces of very fetid pus. They were lined by a firm white membrane, and a thin septum of firm white matter separated them from each other; the one was in the anterior part of the hemisphere, very near the surface, and the other immediately behind it; they had no communication with each other, or with the ventricle. In the posterior part of the right hemisphere, there was a small abscess containing about half an ounce of pus. There was no serous effusion in any part of the brain, and no other morbid appearance.

Case XL.—A gentleman, aged 21, had been for many years affected with cough and puriform expectoration, which was often in considerable quantity; he had also had repeated attacks of hæmoptysis, some of them copious. He was stinted in his growth, and of a feeble habit, but in other respects enjoyed tolerably good health, and was able to attend to his business as clerk to a solicitor, till the beginning of July 1822, when he began to complain of headach. For some time before this he had observed occasionally, while sitting at his desk, a deficiency of sight, but had taken little notice of it.

This illness began with headach, loaded tongue, and quick pulse, and so continued for eight or ten days without exciting any alarm. He was treated in the most judicious manner by Mr. Johnston, and seemed to be recovering gradually, the pulse coming down, and the headach being considerably relieved, though not quite gone. I saw him about the 15th. The pulse had then fallen to 50, he was feeble and languid, with some headach, and a look of oppression. The pupil was rather dilated; there was an evident imperfe tion of vi-

sion, and about this time there was first observed a weakness of the left arm and leg. The headach had been at first referred chiefly to the left side of the head, but now it was principally on the right side, though he often described it as extending across the forehead. The cough continued, with considerable expectoration of a tenacious puriform fluid. There was no pain in the chest, and no uneasiness in breathing, but the pulsation of the heart was felt entirely in the right side of the thorax. This peculiarity had been observed for several years, but it could not be ascertained at what period it had commenced.

His pulse was now feeble and languid, and his general appearance pale and exhausted. For several days there was little change, the pulse continuing about 50, sometimes 48. After three or four days there was a slight convulsive attack, and a second about two days after; these, however, made no change in the symptoms. About the 24th there was some incoherence, but it was slight, and soon went off. The pupil was still considerably dilated, though sensible to the light; a degree of headach continued, but it was not much complained of. He was now disposed to lie without being disturbed, but when spoken to was quite intelligent. About the 26th, there was a remarkable improvement in his appearance, and much less headach, the pulse beginning to rise. (27th) Pulse 108; more comatose, but sensible when roused. (28th) Pulse 120; had copious purulent expectoration in the morning, and seemed much exhausted. He lay much oppressed, but when roused answered questions distinctly. He could still move the left arm, but slowly and with difficulty, and with an awkward motion, somewhat resembling that of chorea, or as if he threw the whole arm forward by a strong effort of the muscles of the shoulder; he had seldom attempted to move the leg for several days. In the course of this day there was observed a slight degree of squinting; and he died in the night without any other change.

Inspection.—The brain was externally healthy. In

the upper and anterior part of the right hemisphere, very near the surface, there was an abscess containing about an ounce of very fetid pus. In the posterior part of the same hemisphere, there was another abscess rather smaller. These abscesses were distinctly defined, but not very distinctly lined by a membrane, and the cerebral matter surrounding them was slightly softened. In the anterior part of the left hemisphere, immediately under the surface, and at the very angle of it which lies over the orbit, there was a small abscess containing from one to two drams of pus, and another rather larger in the posterior part of the hemisphere. These abscesses were all above the level of the ventricles, except the one in the posterior part of the right hemisphere, which went down a little behind the ventricle. The ventricles were empty, and there was no other disease in the brain. The right lung was reduced to a small dark-coloured mass, resembling the spleen, and internally presented a series of abscesses, communicating with each other, and with the trachea. The heart lay in contact with it on the right side of the thorax; and the left lung was so enlarged as to fill all the remainder of the cavity. It was quite healthy, except a small tubercular mass in a firm state, in the upper part of it.

The following case shows the encysted abscess with symptoms remarkably different from those mentioned in the preceding cases.

Case XLI.—A man, aged 43, had complained of headach for ten days, but had not been prevented from following his usual employment. At one o'clock in the morning of the 9th May, 1827, he was seized with palsy of the left side of his face, and became incoherent and unmanageable. When he was seen some hours afterwards by Dr. Huie, these symptoms continued; the pupils were contracted, and the eyes were in perpetual motion; the skin hot; the pulse 90, full and strong. There was no palsy of any of the limbs, but, on the contrary, he made the most powerful resistance when

Dr. Huie attempted to bleed him, which, however, he accomplished to the extent of thirty ounces. In the afternoon there was considerable coma with stertorous breathing, but both these symptoms disappeared after another bleeding. On the 10th, the palsy of the face was gone, but he was still incoherent and restless; pulse 100. Topical bleeding was employed, and purging with croton oil, &c. On the 11th, he was coherent and quiet, pulse 108; but he became incoherent in the afternoon. On the 12th, he was sometimes drowsy and sometimes restless; pulse 120 and small. He died in the night.

Inspection.—Three abscesses were found in the brain, all completely encysted, and filled with well formed pus. The first was in the anterior lobe of the left hemisphere, and contained about three drams of pus. The second was in the posterior lobe of the same hemisphere; it was considerably larger, and had burst into the ventricle, which was filled with the matter. The third was in the posterior part of the right hemisphere, and appeared to be making its way towards the surface.

A still greater obscurity of symptoms occurred in the following remarkable case, for which I am indebted to Dr. Allison. It occurred under his care in the Clinical Ward, in June 1827.

Case XLII.—A man, aged 26, was seized with shivering, headach, sickness, and sudden loss of strength, with fits of delirium in the night. Two days after the occurrence of these symptoms, he was admitted into the Clinical Ward. At this time, he was able to walk when supported on one side, but with feebleness and difficulty, his legs, particularly the right, being at each step dragged along, rather than raised from the ground; his expression was dull and listless, but he said he was free from pain. A few hours after, he complained of violent pain in the occiput, with frequent vomiting. The pain was relieved by a bleeding. In the evening, he was oppressed, and answered questions slowly and

with difficulty; there was still some headach, with nausea; the skin hot and dry; the pulse varying from 80 to 100, sharp, and moderately full; tongue dry; pupils natural; respiration somewhat short and hurried. About half an hour after this report was taken, he sunk into perfect coma, with dilated pupils, for which another bleeding was employed without relief, and in less than an hour he died.

Inspection.—The brain was externally of a reddish-brown colour. On the right side of the vertex, there was a spot the size of a half-crown of a greenish yellow colour. On removing a very thin portion from this spot, an irregular abscess was opened, which contained well formed pus, and which seemed to be entirely limited to the cineritious substance. In the posterior part of the left hemisphere, on a level with the corpus callosum, there was another abscess, which seemed to be seated in the medullary matter, and was surrounded by softened cerebral substance of a livid yellow colour. In the posterior part of the right hemisphere, there were two other abscesses, one in the cortical substance, and the other in the medullary. Here also a fifth abscess was found, of a very small size, being about the size of a pea, but surrounded by a more defined cyst than any of the others; there was extensive ramollissement of the fornix, septum lucidum, and the lower part of the corpus callosum. The left corpus striatum was softened, and had a greenish-yellow colour; the surface of the left thalamus was ragged and almost fluid, but retained its natural colour.

§ XI.—Abscess of the corpus striatum of very small exent.

Case XLIII.—A gentleman, aged 33, in January 1817, had a severe attack of pneumonia with symptoms of carditis, from which he recovered perfectly, after having been bled to the extent of 160 ounces in five days. For some time after he felt his breathing a little uneasy,

but this gradually subsided; and he enjoyed very good health till the middle of February 1819, when, on awaking one morning, he found his whole left side numb and insensible, but without any remarkable diminution of motion. The loss of feeling extended along the half of his face, the line being drawn with much precision along the centre of the nose; he had no other complaint; had no headach, and the pulse was natural. He was freely bled and purged; the symptoms then gradually subsided, and in four or five days were gone. From this time, however, his friends remarked that he was less acute in business than formerly, and that his memory was somewhat impaired. In the month of May, this deficiency rather increased; and, about this time, he complained of slight uneasiness in his head, for which he was again bled. He continued, however, to attend to his business as a solicitor, till the 16th, when he appeared considerably confused, and complained of his head; his pulse was now feeble, so as not to indicate farther general bleeding. After a purgative and topical bleeding, he was much relieved, and in the evening was quite distinct and made no complaint. About two in the morning of the 17th, he was heard to make a remarkable noise in his sleep, which was found to be owing to a kind of convulsive breathing. This was speedily followed by perfect coma, with loss of the power of swallowing. He lay in this state till nine o'clock at night, and then died. All the usual remedies had been employed without the slightest effect.

Inspection.—Every part of the brain was found in the most healthy state, till we came to the left corpus striatum; in the lower part of this there was a small irregular abscess, not exceeding the size of a small bean, containing purulent matter of remarkable fetor. In the centre of the right corpus striatum, there was also discovered a minute abscess regularly and nicely defined, but no larger than a small pea. No other disease could be detected in any part of the body.

§ XII.—Abscess of the medulla oblongata.

Case XLIV.—A child, aged 16 months, whom I saw only a week before his death, had been in a declining state of health 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 part of the head or neck. From this time he was often much oppressed, and had been gradually wasting. Three months before the time when I saw him, he had squinting, and appeared to lose the power of the right arm and leg. The squinting went off after some time, but afterwards recurred occasionally. The use of the arm and leg was never entirely recovered. These always appeared weaker than the limbs of the other side, and he seldom attempted to raise the arm at all. He had also suffered occasionally slight convulsive affections. When I saw him there was no very marked symptom, except considerable emaciation: the pulse was frequent, and the bowels very confined. Much dark-coloured matter having been evacuated from his bowels, he seemed to be relieved. After some days, there was a remarkable slowness of the pulse, and in the course of the same 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 during the intervals; and he took notice of objects a very short time before death.

Inspection.—There were several ounces of fluid in the ventricles of the brain. In the substance of the medulla oblongata, where it is crossed by the Pons Varolii, there was an abscess which appeared to occupy its whole diameter. It had the appearance of a scrofulous abscess, and was contained in a cyst, the inner surface of which was of a yellow colour, and had an appearance of ulceration. There was considerable disease in the glands of the mesentery.

§ XIII.—Abscess of the cerebellum.

Case XLV.—A young lady, aged 18, was seized on 4th March 1813, with 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 time, a variety of purgatives had been given, with repeated tobacco injections; 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 symptoms, excited little attention. It increased, however, and on the 11th had become violent, so that she lay pressing her temples with her hands, and screaming from pain. The pulse was at this time natural, and she was free from vomiting and uneasiness in 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, 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 pupil. There was now little room for active treatment; and topical bleeding, blistering, &c. were employed without relief On the 16th, the pulse began to rise again, but was very variable, in the course of a few minutes varying from 80 to 120. She lay in a state of great oppression, but when roused talked sensibly; headach still severe. (18th) Had lost the power of swallowing, but often asked for drink, though she was nearly suffocated in the attempt to swallow it; the pulse varying from 90 to 150. (19th) Squinting and dilated pupil; pulse varying from 96 to 160. (20th) Squinting

increased; swallowed a little once or twice with effort; at other times was nearly suffocated in attempting it; was still quite sensible when roused, and complained of violent headach. She now sunk gradually, and died on the 22d; she had continued sensible when roused, and knew those about her till an hour before her death. She had also retained the sense of sight, though the pupils were much dilated.

Inspection.—The surface of the brain was natural; the substance showed 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 be of recent formation. A portion of the dura mater on the outer side of the abscess was thickened and spungy; 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.

Another case of abscess of the cerebellum has been described under a former article.—See Case III.

§ XIV.—Ulceration of the Surface of the Brain.

This appearance is uncommon, but it is distinctly described by several writers. A man, mentioned by Dr. Scoutetten, had violent headach, followed by great disturbance of the stomach and prostration of strength. He was relieved by topical bleedings, &c.; but, after a week, the symptoms increased, with fever, and the pain was so violent as to produce screaming. In this manner he went on without relief, and died on the twenty-sixth day,—no other symptoms being mentioned, excepting that he lay with his eyelids closed, and his fore arms bent. On the lower part of the anterior lobe of the right hemisphere of the brain, there was a superficial

ulcer measuring 13 lines by 7. It was of a yellowish appearance, and its edges were unequal and ragged. The dura mater and pia mater covering the spot were destroyed by erosion, and the pia mater was in some other places inflamed; the brain in other respects was healthy. A similar appearance on the posterior part of the brain was observed in a man who died of protracted intestinal disease; he had been affected for three days before his death with œdema of the forehead and left eyelid, headach, delirium, and convulsive motions of the upper extremities.* The same appearance in the cerebellum is mentioned by Mr. Howship.† A soldier at Gibraltar lay down and fell asleep in the sun in a very hot day; he soon awoke in great pain, and was confined to bed for six weeks, with constant and violent pain in the forehead. He then returned to his duty, and was not heard of for six months, when he went into the hospital again, affected with pain in the forehead. It now became remittent, generally returning every morning, but sometimes missing a day, or varying in the hour of attack; there was no fever. Two months after his admission he became suddenly delirious in the night, and soon after expired. On dissection, there appeared a general increased vascularity of the brain, without any decided disease, until the tentorium was raised, when there appeared upon the upper surface of the cerebellum an ulcerated superficial excavation, the size of a shilling, containing a thin ichorous matter. The pia mater at this place was destroyed, and the dura mater was discoloured. Dr. Bright has also given two examples of defined ulceration of the surface of the brain, with loss of substance. In one of them the symptoms were very obscure. In the other, the affection followed an injury of the pericranium, and was fatal after several weeks.

* Arch. Gen. de Med. January 1825.
† Med. and Phys. Journal, March 1810.

The cases described under SECTION V. appear to illustrate the principal phenomena connected with inflammation of the substance of the hemispheres. In Case XXIV. we see it in its recent state on the surface of the brain, and in XXV. we find it in the substance forming a distinctly defined portion in a state of active inflammation. In Case XXIX. we see an inflamed portion of this kind passing gradually into ramollissement; and in Case XXX. we see the ramollissement in a more advanced state. In the subsequent cases, we see more complete ramollissement, both uncombined and mixed with purulent matter. We then find the inflammation passing into a distinct and encysted abscess; and finally we observe it terminating by ulceration of the surface of the brain. Of the cause of these varieties of termination we at present know very little. I have thrown out a conjecture that the ramollissement occurs chiefly in the white matter, and suppuration in the grey; but it is mere conjecture. That the ramollissement however is a result of inflammation, I think the appearances described in some of these cases place beyond a doubt. I have already stated my belief that it also arises from another cause, namely, disease of the arterial system, being thus analogous to gangrene in other parts of the body, which we see arising from these two very opposite causes. In this manner I have proposed to reconcile the diversities of opinion which at present exist among pathologists in regard to this appearance. In the symptoms which accompany inflammation of the substance of the hemispheres, there appears to be such a diversity as must prevent us at present from attempting any general statement of them. The most common appear to be headach followed by convulsion, either of one limb, or of a more general kind; or a sudden attack of convulsion, without previous complaint of pain, the convulsed parts afterwards becoming paralytic. But in Case XXV. no paralysis was observed after three days of the most frightful convulsion; while in Case XXX. paralysis was the first symptom, and convulsion took place at a subsequent period. In other

cases again, we find paralysis of one side of the body and convulsion of the other.

On this interesting subject, however, we have not at present a sufficient collection of facts to enable us to advance to any general statement in regard to the symptoms, or to refer particular symptoms to the particular seats or terminations of the disease. But there are numerous facts of very great interest which deserve to be recorded, without attempting any thing farther than a simple statement of them in connexion with the principal morbid appearances. They refer chiefly to the affection in the various conditions of simple inflammation, ramollissement, suppuration, and ulceration; and to some interesting phenomena connected with the disease in a chronic form.

I. In the state of Simple Inflammation, the affection seems in general to be characterized by headach and convulsion; but in the more chronic form of it, as in Cases XXVII. and XXVIII., we see it productive of paralysis without convulsion, and fatal in a state of simple inflammation, with all the symptoms of perfect apoplexy. On the other hand, in Case XXX., the palsy preceded the convulsion. In some of the cases which terminated by the encysted abscess, there is reason to believe that the inflammatory stage was characterized by convulsion of one or more limbs, followed by temporary paralysis, and that the permanent paralysis took place when the disease passed into suppuration. In some of the other cases, again, it seems probable that the inflammatory state was productive of an attack of palsy, exactly resembling the ordinary hemiplegia from other causes. This probably took place in the very interesting case, (No. XXXIV.) Of the disease in its more chronic form, an important example is related by Dr. Treutler.* A woman, aged 30, had been ill for two months with dropsy, which had followed intermittent

* Treutler. Auctarium ad Helminthologiam Humani Corporis, p. 1.

fever, and was connected with disease in the spleen. In the third month of her illness, she complained of a feeling of weight in the occiput towards the right side, with dimness of sight, and a great propensity to sleep. Her hearing became obtuse, her speech was very indistinct, and her memory was lost. She at last seemed to lose the power of every voluntary muscle, so that she could neither move her legs nor arms, nor raise her head. Finally, she had convulsions and apoplectic attacks, and died suddenly about the end of the third month of her illness, that is, less than a month from the commencement of the symptoms in the head. In the posterior lobe of the right hemisphere of the brain, behind the lateral ventricle, a portion the size of a large walnut, (fructus regiæ juglandis,) was in a state of high inflammation; the membranes adhered to the surface of the brain in several places; where this did not occur, there was serous effusion under the arachnoid. There was no fluid in the ventricles; there were hydatids in the choroid plexus, which were most numerous on the right side. The spleen was much enlarged; and extravasated blood, to the amount of several pounds, was found in the abdomen; it was contained partly in the cavity of the omentum, partly between the laminæ of the mesocolon, and partly under the peritonæal coat of the descending colon.

II. The Ramollissement of the Cerebral Substance does not appear to be characterized by any uniformity of symptoms. In particular, there does not appear to be any foundation for a statement made by some of the French writers, that it is distinguished by tonic contraction of one or more limbs. This symptom occurred in Case XXX. at an early period, and afterwards disappeared. It is also met with in connexion with affections of the membranes, without any disease of the cerebral substance; and with the encysted abscess; and it is frequently observed in cases of typhus, where there is much cerebral disturbance, but which

terminate favourably. Lallemand* remarks that he had taken up the idea of the rigid contraction of the limbs being diagnostic of ramollissement, and was very much perplexed when he met with a case in which all the limbs were in a state of the most remarkable relaxation.

The cases which terminate by ramollissement seem in general to be characterized by convulsion, more or less extensive, followed by paralysis and coma, the convulsion ceasing for some time before death, and being succeeded by the coma; but in Case XXX. the convulsion continued with the utmost violence till the very time of death. In case XXXIV., on the other hand, there was no convulsion, but a sudden attack of palsy, exactly resembling the ordinary attack of hemiplegia from other causes. In the very remarkable Cases, XXXII. and XXXIII., we find ramollissement of very limited extent, as the only morbid appearance, in connexion with symptoms of long standing; both cases being at last rapidly fatal by a sudden attack of convulsion. In some of the subsequent cases, again, we find most extensive destruction of the cerebral substance, without either paralysis or convulsion, and even without coma. In one remarkable case to be afterwards described, namely, the last case under tubercular disease, we shall find destruction of the cerebral substance, to as great an extent perhaps as is upon record; while the patient went to bed in the state of health in which she had been for many months before her death, and was found dead on the morning.

We find the same difficulty in attempting to ascertain the effect of ramollissement of particular parts of the brain, in producing symptoms in particular organs. Convulsion on the same side with the disease, and paralysis on the opposite side, appear to be frequent symptoms, but, as we have seen, by no means uniform. In several of the cases, the speech was remarkably affected, but they present no uniformity in the seat of

* Lallemand, Recherches sur l'Encephale.

the disease. The recovery of speech in Case XXXIII., was a remarkable occurrence. In a case by Lallemand, in which the upper part of both hemispheres was affected, there was resolution of all the limbs; and in one in which the ramollissement was seated in the tuber annulare, there was squinting, with resolution of all the limbs, and distortion of the head backwards. The same writer describes two cases in which the disease was in the cerebellum. In the one, there were headach, phrensy, convulsive motions, and sudden death; in the other, in which it was in the left lobe, there was loss of speech, with palsy of the right side, and stupor; it was fatal in eight days.

III. In the cases which terminate by SUPPURATION, we find the same diversity of symptoms as in the cases now referred to. The suppuration, we have seen, varies, by being in some cases confined in a distinct encysted abscess, and in others forming an undefined mass of disease, in which purulent matter is more or less mixed with cerebral substance in a state of ramollissement. In the latter form of the disease, the symptoms are often exceedingly obscure and undefined, as we see in Cases XXXVI. and XXXVII. In the encysted abscess, they appear to be in general more marked and severe. The course of symptoms in Case XXXIX. 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 bloodletting and other remedies, the arm recovered its motion. The convulsion returned, and the paralysis along with it, and again subsided; and after several attacks of the same kind, the paralysis became permanent. The thigh and leg then went through the same course. In such a case, it appears highly probable, that the convulsion occurs 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 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. Something similar to this occurred in a case to be afterwards mentioned, (Diseases of Bones,) 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 was found in the posterior part of the right hemisphere, inclosed in a fine vascular sac, and containing four ounces of pus. She was first affected with convulsion of the whole body, which continued for nearly two days; during this time, the left side was in a state of rigid extension, and the right was in constant motion; and when the attack subsided, the left side remained paralytic. She then had headach, squinting, blindness, and repeated convulsion; and died after an illness of fifteen weeks, having been comatose for only one day before death. In some cases of this kind, paralysis has occurred without convulsion, and in others, convulsion without paralysis; but one or other of these affections appears to be a common attendant on the encysted abscess. 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 14 days, gradually exhausted; and an abscess was found in the right corpus striatum, which had burst into the ventricle. In a case by Valsalva, in which the disease was in the corpus striatum, the speech was much affected, and one side was paralytic. In another, there were indistinctness of speech, and paralysis of the right side, connected with an ulcerated cavity at the base of the brain on the left

* Edin. Med. Journal, vol. i. p. 150.

side. In a third case by the same writer, there were 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. Many other varieties occur in the symptoms, in regard to which it is unnecessary to enter into any lengthened detail. In a case by Lallemand there were cramps of the limbs, followed by a sudden attack of palsy of the right side. After three days the affected limbs were seized with convulsions, which occurred for several days, and ended in fatal coma. Another case, by the same writer, began with pain in the right side of the head and tremor of the left arm. This was followed by a continued convulsive flexion and extension of the left arm, which after some days passed into palsy. There were then some convulsive motions of the limbs of the right side; the abscess was in the right side of the brain. In a man mentioned by Broussais, an extensive abscess was found in the centre of each hemisphere, without any other symptom than a peculiar dulness of manner, with taciturnity, and at last coma after 37 days. In cases of a more chronic kind, the abscess is often found inclosed in a mass of tubercular matter or indurated cerebral substance. These have probably supervened upon chronic disease of the brain, which, after continuing long in an indolent state, has at length passed into suppuration. In a few cases, abscess has been found in the brain without any symptoms which 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. Powel, was received into St. Bartholomew's hospital on account of cough, dyspnœa, and bloody expectoration. He died after he had been a month in the hospital, having been for some time before his death in a dozing 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.*

* Med. Trans. Coll. of Phys. London, vol. v.

In the encysted abscess of the cerebellum, the symptoms seem to be less violent than when the disease is in the brain. A very slight convulsion occurred once in Case III. In Case XLV. the most remarkable symptom was the loss of the power of swallowing. In a case by Plancus, there was paralysis of one side, and it is stated to have been on the same side with the disease.* In Case III, though the disease was in the cerebellum, the principal seat of pain was in the forehead, and this has been observed in other cases of the same kind.

IV. THE SUPERFICIAL ULCERATION OF THE BRAIN appears to be a rare occurrence, and some of the cases of it present phenomena of rather an interesting character. 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 five weeks, and then suddenly terminated in palsy 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 as much 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, and there was much fluid in the ventricles. A lady mentioned by Dr. Thomas Anderson‡ of Leith, had been for several years liable to headach, which was most violent at the crown of the head. 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 con-

* Storia Med. d'una Postema del lobo destro del cervelletto.
† Trans. Coll. Phys. London, vol. v.
‡ Trans. Roy. Soc. Edin. vol. *ii*.

tinued 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 was afterwards 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 half inches long, one and a half broad, and nearly an inch in depth. In the bottom of it there were found some thin laminæ of a firm brownish matter, with stony concretions, some of which broke into sand on the slightest touch.

The effect of superficial inflammation of the brain, or its membranes, is well illustrated by another case related by Dr. Anderson, in which 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 paralysed, the paralysis being accompanied by convulsion; and the left eye also became again insensible. He had frequent convulsion of these parts for several days, the right side not being in the least affected, when, suppuration having taken place, all the symptoms subsided. Had the disease occurred 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 the brain suppurated five or six times. The at-

tack of inflammation was always accompanied by fever, stupor, and difficult deglutition; but 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 not double vision, but a state of vision in which a candle was seen with a halo around it.

Ulceration of the surface of the brain I have seen only in one instance, in a preparation which was shewn me by Dr. Macintosh. There were on various parts of the surface of the left hemisphere, spaces of superficial ulceration of various extent, with ragged edges, and sensible loss of substance. The affection occurred in a child of 18 months, and was complicated with effusion in the ventricles, and ramollissement. The pia mater and arachnoid were destroyed at the ulcerated spots; and the pia mater in other places was studded with minute tubercles. The symptoms were not to be distinguished from those of hydrocephalus in its ordinary form. There were also numerous granular tubercles in the lungs.

V. THE INFLAMMATION OF THE CEREBRAL SUBSTANCE OCCURS IN A CHRONIC FORM, in which the symptoms may continue for months, and the disease then prove fatal by suppuration, or without having suppurated. In Cases XXVII. and XXVIII. we have remarkable examples of this form of the disease proving fatal without suppuration. In Case XXVII. we can have little doubt that the disease had existed in the first attack, and, after a protracted illness, had been removed or in a great measure subdued. It then took place again, and was fatal with loss of speech, palsy, and coma; yet after all, it had not advanced beyond the state of simple inflammation. The progress of this more chronic form of the disease seems to differ considerably from the other modifications of it. We have seen that it may continue for a considerable time in a state of simple inflammation, and in that state may be fatal with all the symptoms of

perfect apoplexy. It may also, after continuing for some time in this state, pass into ramollissement or suppuration; but it appears, that in some cases it terminates by induration of the part of the brain which has been the seat of it. A degree of this occurred in Dr. Hay's case, and it appears probable that, as the induration advances, the inflammatory appearance subsides; the part is then left in a state of simple induration, and at a more advanced period may pass into unhealthy suppuration. This state of disease may either affect a considerable portion of the brain, from the surface downwards, or may be confined to a small circumscribed portion in the substance of the hemisphere. In this case, the affected portion appears, in some instances, to be afterwards surrounded by a cyst, and this appearance has been called a tumour in the brain. It is probable that it is merely a part of the cerebral substance in a state of low scrofulous inflammation; that in its early stage, it is a disease which may be cured; and that the formation around it of a cyst of coagulable lymph, or its termination by induration of the part, are the points in its progress which give it the character of organic or hopeless disease. In either of these states it may be fatal after protracted symptoms, or it may terminate by 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. Fantonus found a similar disease in the corpus callosum, in a man who had been long affected with epileptic paroxysms, and at last died comatose and convulsed. 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 on the left side. He found another in the posterior part of the brain near the tentorium, 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 interest. The symptoms may go on for several months, so as to assume the character of organic disease; they may remit, so as to resemble periodical headach; the disease may be fatal with symptoms resembling apoplexy; or it may pass into permanent induration of the part affected; or, after it has appeared to resist all our remedies, it may gradually subside. This agrees exactly with the course of chronic or scrofulous inflammation, as we observe it in external parts. We see it in the eye, in the lymphatic glands, in the testicle, in the mamma, and in the cellular texture. It takes place rapidly, producing enlargement of the parts, and derangement of the functions; it may continue stationary for a considerable time; it may then terminate by unhealthy suppuration or ulceration, or by permanent induration of the part; or, after resisting for a long time all our remedies, it may gradually subside, without leaving any permanent change in the organization of the part. I think there is little doubt that something of this kind takes place in the brain, and if this doctrine be admitted, the practical application of it will be, that we shall be less disposed than we usually are, to consider such cases as depending upon organic disease, and consequently not the objects of active treatment.

The progress of this interesting affection is well illustrated by Case XXVII., and there are others on record which show it under some varieties in the symptoms. A gentleman, mentioned by Dr. Powell, was affected with severe headach, which occurred in paroxysms; during the paroxysms, which often continued for several hours, he had double vision, mental depression, and at one time muscular twitches and numbness of the left side. The pulse was variable, being sometimes a little frequent, and sometimes rather below the natural standard. By large and repeated bloodletting, &c. he was

much relieved, but after a short interval of relief, the complaint returned with great violence, and his vision remained permanently double. 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 with 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 bark; 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 occurred at very uncertain intervals. They sometimes consisted of pain only, and sometimes of pain accompanied by the 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 had sat up for two hours on the day preceding the night on which he died. The anterior part of the right hemisphere was found much changed in its structure and indurated, so that it is described as a tumour. When the dura mater was first removed, the part thus affected appeared to rise higher than the neighbouring parts, and the cerebral substance surrounding it was very soft. The morbid condition here described is probably a different stage of the disease which occurred in Cases XXVII. and XXVIII.; and there was a considerable similarity in the symptoms to the first attack in Case XXVII.

The affection may likewise pass into a still more chronic state of induration, in which it may be protracted for a greater length of time, but producing urgent symptoms; and may at last be fatal by suppuration, or without having suppurated; or, if it be seated in the superficial parts of the brain, it may terminate by the ulceration of the surface formerly referred to. 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 18 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 at the posterior part were found inflamed and much hardened. The diseased parts adhered closely to the dura mater, and to the falx; and the dura mater at that part, was thickened and indurated. A man, aged 45, mentioned by the same writer, had been liable for several years 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 intervals, 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 was killed by an injury of the head. A portion of the left hemisphere of the brain was found indurated, and closely adhering to the dura mater, which at that place was 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 months 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. Baader relates the case of a man, aged 40, who became suddenly epileptic, with pain at a particular part of the left side of the head. There was 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 pain, there was superficial induration of a portion of the brain, and under the indurated part there was an abscess the size of an egg.

From the imperfect view now given of this subject; I think it will appear, that the inflammation of the cere-

bral substance is an affection deserving accurate investigation. There is every reason to believe, that it exists in various degrees of activity; that in the most active form it advances speedily to ramollissement or suppuration; but that it also exists in a chronic form, in which its progress is very slow, so that it may produce urgent symptoms for a considerable length of time, without having advanced beyond that stage in which there is a chance of recovery. This latter form we have seen reason to believe may afterwards pass into suppuration, or may terminate by induration of the cerebral substance, and may thus assume the characters of organic disease. The disease may affect any part of the brain, and often appears to commence in a very small portion of it, and to extend gradually over a larger portion. It appears to be in cases of this kind that we chiefly meet with some singular examples of gradual paralysis, beginning perhaps in a very slight degree, or in a single muscle, and advancing very gradually to more perfect and more extensive palsy. A small part of the brain in such cases is probably undergoing this low state of inflammation, gradually gaining ground, and at length terminating either by fatal coma or permanent paralysis.

In the palsy connected with this inflammatory affections, there is sometimes, especially in the early stages, violent pain in the affected limbs. In some cases, again, the loss of power is accompanied by total loss of feeling; in others, the feeling remains entire; and some remarkable examples are met with, in which the feeling is morbidly increased. A case of this kind has been already referred to; another is mentioned by Lallemand. In this case there had been, after a blow on the head, headach, impaired intellect, and weakness of the limbs. Six weeks after, there was a sudden attack of loss of speech, with palsy of the right side, and increased sensibility of the parts, so that a touch was painful. Ten days after this, there was an attack of palsy of the left side, with fatal coma. There was an appearance of inflammation and extensive ramollissement of the cerebral substance of the left side, and on the right side, extra-

vasation of blood, which had obviously been the origin of the fatal attack.

The disease occurs in the cerebellum in the same chronic form which has now been referred to in regard to the brain; it in some cases exhibits nearly the same symptoms, and in others the symptoms are extremely obscure. A man mentioned by Mr. 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.* A man, mentioned by Serres,† after a blow on the back and lateral part of the head, which stunned him at the time, had a certain unsteadiness in walking, which made him always anxious to take the arm of a friend; and he had a delicacy of his head, which made him much affected by a small quantity of wine. This continued about eighteen months, when he became sad and irritable, with trembling of the limbs. Soon after, the left leg became paralytic, and the arm of the same side was numb and weakened. After the insertion of a seton in the neck, the arm recovered, and, three months after this, the patient died with fever, delirium, and an affection of the bowels. There was disease in the right lobe of the cerebellum, with an abscess, and extensive softening. In another man, mentioned by the same writer, who died in forty days, there was palsy of the right leg with wasting of the limb, but without loss of sensibility, the arm being little if at all affected. There was ramollissement of the left lobe of the cerebellum, occupying chiefly the centre of the left peduncle.

* Edin. Med. Ess. and Obser. vol. vi.

† Recherches Sur Le Cervelet.—Journal de Physiologie, 1822—23.

SECTION VI.

INFLAMMATION OF THE CENTRAL PARTS OF THE BRAIN,—THE CORPUS CALLOSUM, SEPTUM LUCIDUM, FORNIX, AND THE MEMBRANE LINING THE VENTRICLES.

The morbid conditions which I mean to consider under this head, embrace the various forms of disease which have usually been included under the term acute hydrocephalus. In venturing to refer them to a place in the general arrangement of the inflammatory affections of the brain, I may perhaps be considered as advancing too rapidly to a conclusion in regard to the pathology of this important class of diseases. But from all that I have observed of the affections themselves, and from the analogy of the corresponding diseases in other parts of the brain, I have now very little hesitation in arranging them in this manner. I shall state the grounds which have induced me to take this view of the subject, and, confining myself in a great measure to a faithful relation of facts, shall merely propose the inquiry as one of much interest for farther observation.

The disease seems to present itself under two different forms. In the one, the inflammation appears to be seated in the membrane lining the ventricles; in the other, in the white matter forming the fornix, septum lucidum, and corpus callosum. In the former case, we find the ventricles filled with a turbid or milky fluid, sometimes containing shreds of coagulable lymph, and sometimes having entirely the characters of purulent matter. These appearances are often combined with a deposition of flocculent matter or false membrane on the surface of the choroid plexus, or on the inner surface of the membrane lining the ventricles, and sometimes with ramollissement of the cerebral matter immediately surrounding them. In the latter case, the affection presents itself in the form of ramollissement or white pulpy de-

generation of the parts affected. The septum lucidum is found perforated by a ragged irregular opening, from the softened portion having fallen out. The fornix has lost its consistence in the same manner; and either has lost its figure, by having fallen down into a soft irregular pulpy mass, or, retaining in some degree its figure, while it is not disturbed, falls asunder when the most gentle attempt is made to raise it. The lower part of the corpus callosum is often affected, though, I think, more rarely than the other parts; and there is frequently a similar degeneration of the cerebral matter immediately surrounding the ventricles. It is generally, but not always accompanied by effusion in the ventricles of limpid fluid. The substance which is the product of the disease, is of a pure white colour, without fetor, and without the slightest resemblance to purulent matter. It sometimes shows a slightly fibrous texture, but in general is entirely of a soft pulpy consistence without any cohesion of parts.

From all that I have observed of this affection, I have no hesitation in considering it as the termination of inflammation in these particular parts. It is an appearance of very frequent occurrence, and seems to hold an important place in the pathology of the brain, and particularly in the pathology of acute hydrocephalus. A most interesting point in the history of it is, that it may be fatal without effusion, and without any other morbid appearance, though with all the symptoms which are usually considered as indicating acute hydrocephalus. The first case of it which I shall present seems to establish the inflammatory origin of the affection, by showing the perforation of the septum lucidum, surrounded by a ring of inflammation; I shall then show it as the only morbid appearance in cases which were fatal with the usual symptoms of acute disease in the brain; and finally, shall submit a selection of cases, showing its connexion with serous effusion in the various forms of acute hydrocephalus. In regard to the pathology of this affection, I may also refer to the facts formerly adduced with respect to the ramollissement in other parts of the brain.

Some of them seem to furnish the most satisfactory evidence of the inflammatory origin of this appearance, by enabling us to trace, in the same mass, one part in a state of inflammation, and another in a state of ramollissement, and the one distinctly passing into the other.

I shall begin this part of the subject by an example of an affection, which seems to be rare.—inflammation confined to the membrane lining the ventricles.

§ I.—INFLAMMATION OF THE MEMBRANE LINING THE VENTRICLES.

CASE XLVI.—A child, aged 10 months (January 1819) had fever, starting and vomiting; tongue white; bowels obstinate. After a week, the symptoms abated; his sleep became calm, and he was at times playful; but the vomiting continued, with frequent pulse. In this manner, he continued without any remarkable change in the symptoms for nine or ten days; he then became affected with squinting and blindness, and very rapid pulse, and the vomiting continued; he died three days after the occurrence of these symptoms, and death was preceded by a slight convulsion.

Inspection.—The ventricles were distended with six ounces of fluid, which was turbid, and contained in it flakes of yellow coagulable lymph. The lining membrane of the ventricles was thickened, and was easily separated by dissection: its inner surface was covered by a thick coating of soft yellow adventitious membrane. The septum lucidum appeared to be thickened, and the pineal gland was distended with a greenish fluid. On the posterior part of the cerebellum, the arachnoid, to the extent of a crown piece, was thickened and covered by adventitious membrane; betwixt it and the pia mater at this place, there was some deposition of puriform matter.

A case considerably similar to this in the morbid ap-

pearances, is related by Golis,* though the progress was much more rapid, and the symptoms were more violent. A child, aged 14 months, after a restless night, was seized with violent fever and general convulsion, which subsided after topical bleeding, but soon returned with great violence, accompanied by spinal cramps, hemiplegia, blindness, dilated pupil, and distortion of the face; he died the same night, about thirteen hours after the attack. The ventricles contained three ounces of turbid fluid; the inner surface of the ventricles and the surface of the choroid plexus were covered by adventitious membrane; and a similar deposition was found on the corpus callosum, and on the convolutions of the brain. The same appearance is mentioned by this author in several other cases. Inflammation must have existed in the same part in a case formerly described (Case XV.), in which, along with extensive meningitis, there was purulent matter filling the ventricles. Morgagni describes a case in an adult, in which the left ventricle was found full of purulent matter without any disease of the cerebral substance. The characters of this case were fever, apoplectic symptoms, delirium, convulsions, and palsy of the right side. An interesting case is also mentioned by M. Gendrin, in which both lateral ventricles, and the third ventricle, were distended with turbid fluid; their lining membrane thickened, and covered with a thick greenish-yellow matter; and the fourth ventricle was full of pus. The patient was a man 41 years of age, who, after complaining for five days of headach, lassitude and impaired digestion, was seized with fever, with increase of headach and vomiting, followed by drowsiness, delirium, rigidity of the neck, and dilated pupils, and he died comatose in six days.

* Golis on Hydrocephalus Acutus, Case II.

§ II.—THE INFLAMMATORY ORIGIN OF THE RAMOLLISSEMENT OF THE SEPTUM LUCIDUM.

CASE XLVII.—A girl, aged 6, about two months before her death, had a violent and obstinate diarrhœa, by which she was much emaciated; after three or four weeks it abated considerably, and for a fortnight she was better. She was then seized with severe pain of the belly, vomiting and headach, the bowels being rather obstinate. The pain of the head was violent, and chiefly referred to the forehead. The pulse was from 30 to 40 in a minute, and there was a constant convulsive motion of the right arm and leg. Without any remarkable change in the symptoms, she sunk gradually into stupor, and died after two days of perfect coma, about a fortnight from the commencement of the headach. The convulsive motion of the right arm and leg continued through the whole course of the disease, and almost to the moment of death. The pulse continued from 30 to 40 in a minute until a few days before her death, when it rose to 70, and occasionally to 80.

Inspection.—The ventricles of the brain were distended with colourless fluid. In the septum lucidum, there was a ragged irregular opening from loss of substance, and the opening was surrounded by a ring of inflammation. The inner surface of the ventricles was in a state of high vascularity, and the cerebral substance immediately bounding them, was in some places considerably softened and broken down. In the anterior part of the left hemisphere, a portion of the brain was dark-coloured and firmer than natural, and some small hard tubercles were imbedded in it. The inner surface of the caput coli and of the ascending colon was of a dark-red colour, and large patches were elevated into a dark-red fungus.

§ III.—RAMOLLISSEMENT OF THE CENTRAL PARTS FATAL WITHOUT EFFUSION.

Case XLVIII.—A woman, aged 30, (18th June, 1816,) was affected with violent pain in the head, which extended across from temple to temple. She was extremely restless, 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; the pulse 60, soft and rather weak; tongue white. She was bled repeatedly, both generally and topically, and used purgatives, cold applications to the head, blistering, &c. For three days she appeared much relieved; the violent pain was removed, and she complained of pain only 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 that "she felt a difficulty in getting out her words;" pulse 112. (23d and 24th,) Increasing stupor, and at times incoherence, but, when roused, she answered questions distinctly; double vision; made no complaint, but said her head was better. Pulse from 112 to 120. (25th,) Increasing stupor. (26th,) Complete coma and dilated pupil; pulse 108 and of good strength; died in the night.

Inspection.—The fornix and septum lucidum were broken down into a soft white pulpy mass. There was no effusion in the ventricles, and no other disease in any part of the brain.

Case XLIX.—A man, aged 36, a blacksmith, had been for some months affected with pectoral complaints, which were considered as phthisical. On the 10th of November, 1818, being suddenly told of the death of his daughter, who died of phthisis, he instantly complained of headach; and, after another day or two, a remarkable change was observed in his temper, which became uncommonly fretful and irascible. He still com-

plained of constant headach, which was much increased by motion; his pulse varied from 70 to 110. In this state he continued for a week, without any alleviation of the headach. In the second week, he began to be slightly delirious, with a tendency to stupor, the headach continuing very severe. He became gradually more and more oppressed, and at last comatose; and, after perfect coma of four days' continuance, died on the 27th. His pectoral symptoms had entirely subsided after the commencement of the complaints in his head. I did not see this patient during his life, but was present at the examination of the body.

Inspection.—The membranes of the brain were very vascular. There was no effusion in the ventricles beyond the usual quantity. The septum lucidum was much broken down, and a large opening was formed through the centre of it. The fornix was reduced to a soft white mass, which could not be raised. There was no other morbid appearance in any part of the brain. The lungs were extensively tubercular, and in some places suppurated.

The two cases now described are the only examples which have occurred to me, of the ramollissement of the septum and fornix being fatal without any other morbid appearance. The only cases in which I find it taken notice of by other writers are, one by Senn and one by Lallemand. In the case of M. Senn,* the patient was eleven years of age. After some days of fever, with pain of the belly and vomiting, she complained of violent pain in the forehead, which was constant and severe for several days; and, after a day or two, was accompanied by dilated pupil, and distortion of the eyes upwards. This was followed by delirium and a spasmodic retraction of the head; she died on the eighteenth day of the disease, without perfect coma. The ventricles of the brain contained but a few drops of fluid. There was extensive ramollissement of the corpus callosum, septum

* Senn, Recherches sur la Meningite Aigue des Enfans, Case VIII.

lucidum, and fornix, without any change of colour of the parts. The vessels of the membranes were distended with blood; there was no other morbid appearance in any part of the brain. The patient of M. Lallemand* was a woman of 40 years of age, who died after an illness of about fourteen days; the principal symptoms were, fever with violent delirium, and convulsive movements. There was extreme loquacity for some days, afterwards somnolence and contraction of the limbs, with extreme sinking. The brain was found entirely sound, with the exception of the corpus callosum and fornix, which were transformed into a species of white pulp.

§ IV.—Ramollissement of the central parts combined with serous effusion, constituting the most common form of acute hydrocephalus.

Case L.—A boy, aged 12, (August, 1818,) had been for several weeks observed to be languid and declining in strength, with some cough and pain in his breast. A fortnight before death, he began to complain of his head, and was then first confined to bed. After a week, when he was first seen by a medical man, he still complained much of his head, was oppressed, and answered questions slowly and heavily; had some diarrhœa and frequent pulse. The oppression increased, and four days before his death he lost his speech and the power of the right side. This was followed by blindness and perfect coma, and he died about the 14th day from the commencement of the affection of the head, the pulse having continued uniformly frequent through the whole course of the disease.

Inspection.—All the ventricles were distended with fluid; the septum and fornix were so completely broken down, that the two lateral ventricles and the third ven-

* M. Lallemand, Recherches sur l'Encephale, tome i. p. 184.

tricle seemed to form one cavity; there was also extensive ramollissement of the cerebral substance on the anterior part, so that the cavity thus formed by the ventricles extended within half an inch of the anterior part of the brain.

Case LI.—A boy, aged 7, (October, 1818,) had fever, and headach, which was referred chiefly to the back part of the head; and the bowels were obstinate. After six or seven days, the pulse came down to the natural standard. The headach continued without any remarkable symptom till a few hours before his death, when he fell into a general state of tonic spasm of the whole body. He died after continuing in this state two or three hours about the 14th day of the disease. There had been in this case no coma, but he had continued quite sensible till the attack of the convulsive affection.

Inspection.—The ventricles were distended with fluid, and there was extensive ramollissement of the septum and fornix, and of the cerebral matter immediately surrounding the ventricles.

Case LII.—A strong young man, aged 20, (18th September, 1814,) was affected with violent headach, extreme restlessness and some delirium; face flushed; pulse 60. He had been unwell so as to keep the house for a week, but had been only occasionally in bed; the symptoms had been much increased for two days; pulse on the former days from 80 to 90. Large and repeated bloodletting, and the other usual remedies, were employed with activity.

(19th and 20th,) No improvement; violent headach, and a good deal of delirium; pulse from 75 to 80.

(21st and 22d,) Less delirium; pulse 80.

(23d and 24th,) Continued better; pulse from 80 to 84.

(25th,) A tendency to stupor; began not to know those about him.

(27th,) Perfect coma, in which he lay for four days, and then died. His pulse had continued from 75 to 84.

Inspection.—Much fluid 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 there was also considerable softening of the cerebral matter immediately surrounding the lateral ventricles. There was a deposition of false membrane on the upper surface of the cerebellum.

Case LIII.—A man, aged 21, (3d Sept. 1816,) was affected with violent headach, impatience of light, and frequent vomiting; had an oppressed look, with a fixed expression of his eyes; pulse 70 and strong; had been ill six days; and for three days had vomited almost every thing he had taken. After bloodletting and the other usual remedies, his headach was very much relieved, and he was free from vomiting for two days. On the 7th, he was free from headach, and his look was natural; but his pulse had fallen to 48, and he had occasionally double vision. On the 9th, he was sitting up and dressed, his pulse 60. He was free from headach; tongue clean, and he had some appetite, but the double vision was constant.

(10th,) Vision natural, in other respects as before.

(11th,) Pulse 96; made no complaint, but his look was vacant, and the pupils were dilated; there had been some delirium in the night.

(12th,) Pulse 96; considerable delirium, vision natural.

(13th,) Increasing stupor. (14th,) Perfect coma, pulse 120. Died on the 15th.

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

CASE LIV.—A gentleman, aged 21, had been for some time affected with cough and occasional hæmoptysis. In the beginning of December 1823, he began to complain of headach; he was not confined, but, on the contrary, walked in one day a distance of eight or nine miles after the headach began. The headach encreased gradually, but he was not confined till about the 7th day. From the 7th to the 14th day, he was confined chiefly to bed, complaining principally of sickness and giddiness, and occasional vomiting. On some days there was headach; on others, little or none. On Monday the 15th, he was up and dressed for some hours, but had double vision. On the 16th, he was oppressed and much disposed to sleep; the double vision continued. I saw him for the first time on the 17th; he was then almost entirely comatose, with squinting, the pulse below 60. On the 18th, after free purging, he revived considerably, and answered questions distinctly; squinting and double vision continued, with dilated pupil; he made no complaint of his head. On the 19th, the pulse began to rise; and there was a good deal of incoherent talking. On the 20th, there was constant incoherent talking, with a small rapid pulse, and he died in the night. From the commencement of the head symptoms, his pectoral complaints had entirely disappeared.

Inspection.—There was partial ramollissement of the septum lucidum and of both the thalami; the ventricles were distended with fluid; the lungs were extensively tubercular, and there were several small cavities containing a bloody fluid.

Before leaving this subject, it may be right to add a few cases illustrative of some of the most important varieties in the symptoms, and showing the disease at various ages and under various circumstances.

CASE LV.—*Sudden attack of coma without previous headach—the pupils dilating on the admission of light.*—A stout boy, aged 6, had been for several days feverish

and complaining of pain in his belly. After the operation of laxative medicine, his pulse came down to the natural standard; he continued languid and listless, but made no complaint of any uneasiness, and had never been heard to complain of headach. About the 5th or 6th day of his illness, 10th July, 1816, without any farther warning, he was found in the morning in a state of perfect coma, speechless, and his pupils much dilated; pulse 120. He continued in this state of perfect coma, with frequent convulsive motions of the left arm and leg, for six days, and then died, his pulse having continued steadily at 120 and upwards. On the 12th and 13th, being the 9th and 10th days of the disease, the pupils, which were partially dilated, were distinctly observed to dilate farther upon the admission of light.

Inspection.—The ventricles contained about four ounces of fluid. There was extensive ramollissement of the septum and fornix, and of the cerebral substance immediately surrounding the ventricles; this was most remarkable on the left side.

Case LVI.—*Two distinct periods of coma.*—A boy, aged 13, (13th June, 1822,) had slight headach, with some vomiting and fever. After four days, the headach increased and the pulse fell to 60.—5th day, Coma. He came out of the coma on the following day, and the only prominent symptom was remarkable obstinacy of his bowels, which was only got the better of after two days by repeated dozes of croton oil; he then seemed much relieved, made very little complaint of his head, was quite free from stupor, and the pulse was natural. On the following day, he complained rather more of his head, then relapsed into coma, and died on the 12th day after some convulsion.

Inspection.—The ventricles were distended with fluid, and there was extensive ramollissement of the fornix and septum, and of the lower part of the corpus callosum.

Case LVII.—*Hydrocephalus with Hemiplegia.*—A girl, aged 3, after being three days languid and complain-

ing of some headach and pain in the bowels, was first confined to bed on the 4th June, 1822. She was oppressed, the pulse 100; there was some vomiting, and she complained of headach, which seemed to be referred chiefly to the right side of the head. For a week the usual remedies were employed, and there was little change in the symptoms. On the 13th, complete palsy took place in the left arm and leg, which continued from this time entirely motionless, except at one time when they were moved by convulsion. After this, she fell into a dozing state, with dilated pupil and slow pulse; but complete coma took place only two days before death, which happened on the 22d.

Inspection.—The ventricles were distended with fluid. In the substance of the right hemisphere, very near the ventricle, there was a considerable portion in a state of complete ramollissement; and, contiguous to this, anteriorly, there was a long and narrow portion of the cerebral substance in a state of remarkable induration.

Case LVIII.—*In an adult with very obscure symptoms and fatal after the coma had disappeared.* A lady, aged 30, about the 5th June, 1824, was exposed to cold and fatigue during the flow of the menses, which ceased prematurely. After this, she was for some days observed to be remarkably languid, dull, and depressed. The pulse was natural; she complained of slight headach, but her appearance had excited an apprehension rather of aberration of mind than of any bodily complaint; and in this manner the affection went on for 9 or 10 days. I saw her on the 15th; she was then odd in her manner, abrupt and absent, but quite sensible when spoken to; complained of slight headach: pulse a little frequent. On the 16th, she was much oppressed, and on the 17th, in a state of nearly perfect coma, which continued on the 18th. On the 19th, after free purging with croton oil, she came out of the coma entirely, was quite sensible to every thing, and no alarming symptom remained, except that she sometimes saw objects remarkably distorted, and sometimes double. At other times, her

vision was quite natural; the pulse was frequent, and the tongue loaded. In this state she continued for several days; she then complained again of headach; there was occasional incoherence: the sight was more indistinct, and the pupil dilated: and the pulse was increasing in frequency. The pulse continued to rise, with much incoherent talking, and sinking of strength; and she died on the 25th, without coma.

Inspection.—The ventricles were distended with fluid, and there was extensive ramollissement of the septum and fornix. There was no other morbid appearance.

Case LIX.—*Remarkable remissions and apparent convalescence.* A boy, aged 7, (20th October, 1824,) complained of pain in the back of his head, with fever and some vomiting. Topical bleeding, purgatives, &c. were employed, and, after being an object of some anxiety for several days, (a brother having a short time before died of an affection of the brain,) he gradually improved, and on the 27th and 28th, was free from complaint, and going about the house apparently in his usual health. On the evening of the 28th, he was suddenly seized with violent convulsion, which returned through the night every two hours, leaving him in the intervals in a state of coma; the pupils dilated, and insensible. On the 29th, he was nearly comatose the whole day, the pulse weak, and varying in frequency from 60 to 120. General and topical bleeding, purgatives, &c. had been employed. (30th,) Became quite sensible; the eye natural; pulse still frequent. He complained slightly of the back of his head, for which more topical bleeding was employed, with purgatives. He then improved progressively; the pulse was from 80 to 90: and he was free from complaint, except that the bowels were torpid and the stools unhealthy, and that the pupil was large, and contracted slowly on the admission of light. In this state he continued several days, when the convulsion returned with greater severity five or six times, leaving him as before in a state of coma. From this he recovered partially, but sunk gra-

dually, and died in a few days. For two or three days before his death, there appeared to be considerable palsy of the left arm and leg.

Inspection.—There was extensive effusion in the ventricles, and extensive ramollissement of the fornix. The right lamina of the septum lucidum was in a state of ramollissement at the anterior part, occupying about the half of it; and the left lamina was in the same condition in its posterior half; there was no perforation.

An interesting modification of this affection is that which supervenes upon other diseases, chiefly of a chronic nature, especially affections of the lungs; and the remarkable circumstance in these cases is, that the pectoral symptoms generally cease after the commencement of the symptoms in the head. The three following cases will illustrate the principal forms of this affection.

Case LX.—An ingenious artist, aged 30, had been affected for some years with cough and expectoration, which was decidedly purulent; but, though much confined to the house, he was able to attend to his business as an engraver. In the beginning of June, 1819, being one day considerably agitated in the discussion of some business in which he thought himself ill used, he felt uneasiness in his head, and soon after his speech became very indistinct. The headach increased, and was chiefly felt in the left side and back of the head, and the pain extended to the upper part of the neck; his speech continued much impaired; the pulse from 90 to 96. The usual remedies were employed, with partial and temporary benefit. The case was drawn out to nearly three weeks, without any remarkable change in the symptoms. He sunk gradually into coma, and died; the pectoral complaints having subsided as those in the head advanced.

Inspection.—There was extensive effusion in the ventricles of the brain, and complete destruction by ramollissement of the septum lucidum, fornix, part of the corpus

callosum, and the cerebral matter bounding the ventricles. In the upper part of each lobe of the lungs, there was a portion the size of a small orange in a state of great induration, and internally presenting an irregular mass of ulceration; the lungs in other respects were healthy.

Case LXI.—A gentleman, aged 24, had been affected for about eight months with cough and expectoration. In August, 1824, he was seized with copious hæmoptysis, and had frequent attacks of it during August and September. In October this ceased, but the cough continued severe, with copious purulent expectoration and great loss of flesh and strength. In the end of November, he began to complain of headach, which continued from this time to affect him considerably, accompanied by occasional vomiting; the cough and expectoration continuing. From this time he became much less able for exertion than formerly, but no remarkable change was observed in the symptoms till the first week of January, when one evening he suddenly lost his speech. He recovered it again next day, but complained of headach, and was listless and languid. On the third day he lost his speech again, and recovered it on the 4th. He lost it again on the 5th, and on the 6th recovered it. From this time his speech continued tolerably distinct, but he gradually sunk into a kind of fatuous state, with occasional paroxysms of high delirium, and repeated convulsive affections of the face and upper extremities. The pulse continued nearly natural; the expression of the countenance was remarkably vacant, and he still frequently complained of his head. He thus gradually sunk into coma, and died in about three weeks from the time when he first lost his speech. From the commencement of this attack his cough ceased entirely, until a few days before his death, when it returned in a very slight degree.

Inspection.—There was considerable effusion in the ventricles, and extensive ramollissement of the septum, fornix, and adjoining parts. Along the base of the brain, there was an extensive deposition of yellow ad-

ventitious membrane of considerable thickness. There was extensive tubercular disease in both lobes of the lungs, with numerous large vomicæ.

Case LXII.—A lady, aged 28, had been for some months in winter 1823-24 affected with cough, considerable expectoration, some uneasiness in the chest, great loss of flesh and strength, and quick pulse. She came to Edinburgh about the 20th of May 1824; the cough then subsided remarkably, which was ascribed by her friends to the change of air, and in a few days it entirely ceased. She then continued pretty well till about the 27th, when she began to complain of headach, and for the next three days she was dull and silent, seemed absent and low-spirited, and complained that her sight was dim. She was partly in bed, but her pulse was natural. On the 31st, the pulse began to rise, and there was considerable incoherent talking. I saw her for the first time on the following day, the 1st of June; her look was then absent, vacant, and anxious, and she talked a little incoherently, but understood what was said to her; there was double vision and slight squinting, the pulse very frequent. (2d,) Sight seemed much impaired, pupil dilated, much wild talking at times, but she knew those about her, and answered distinctly when spoken to; pulse rapid and feeble,—died in the night without coma.

Inspection.—The ventricles of the brain were distended with a large quantity of fluid, and there was extensive ramollissement of the septum, and all the central parts. About and above the optic nerves, there was a considerable deposition of coagulable lymph in a firm, dense, opaque state. The lungs were tolerably healthy in their structure, but there were marks of extensive chronic inflammation of the pleura on the right side, with considerable deposition of coagulable lymph.

It is unnecessary to multiply cases which present no particular variety in the phenomena; those which have been described will probably seem sufficient to illustrate

the principal forms of this affection, and at the same time to exemplify some of the most remarkable varieties in the symptoms. From a fair and candid review of the whole subject, I think we can have little hesitation in concluding, that this is the ordinary form of the disease, which is commonly called acute hydrocephalus; that it is originally an inflammatory affection, chiefly seated in the substance of the central parts of the brain; that it generally terminates by ramollissement of these parts, combined with serous effusion in the ventricles; and that it may be fatal by the ramollissement alone, even of small extent, but with all the symptoms which are commonly considered as characteristic of acute hydrocephalus. The cases likewise exemplify various important varieties in the symptoms. We have seen in some of them, perfect coma of long continuance without any effusion; and in others, extensive effusion without any degree of coma. We have seen again the coma entirely removed, and yet the disease go on to its fatal termination. We have seen every variety in the state of the pulse, of the vision, and of the intellectual functions; and we have seen the disease run its course without any complaint of pain or any symptom indicative of danger, until the patient was unexpectedly found in a state of profound coma. These and many other varieties, presented by the cases which have been described, show us the danger of being guided by system in our diagnosis of affections of the brain, and the necessity that there still is for extensive and careful observation of facts in regard to this class of diseases.

The form of the disease which has now been described, I conceive to be the more common modification of acute hydrocephalus; but it is to be kept in mind that serous effusion takes place in the brain under other forms. In some of these it is connected with inflammatory affections of other parts of the brain or of the membranes; but it may take place without exhibiting any other appearance, excepting the simple effusion. As a contrast to the cases now described, I shall add two examples of

hydrocephalus which presented simply serous effusion in the ventricles, without any other morbid appearance in the brain; and, with regard to these two cases, I think it right to add, that they are the only examples of this kind which I find among my notes of cases of idiopathic hydrocephalus. It will be seen that they exhibit the disease in its most insidious and chronic form, and present a remarkable contrast to the active symptoms in some of the former cases.

§ V.—Cases of simple effusion.

Case LXIII.—A boy, aged 9, was affected with slight headach, foul tongue, bad appetite, and disturbed sleep; pulse from 96 to 100. The first week of his illness was passed with these slight symptoms; he was one day better and another rather worse; his headach was sometimes gone for a great part of the 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 the mildest form of continued fever, and was considered in that light by a physician 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 15th day, the pulse sunk rather suddenly to 70; and the headach was increased. On the 16th day there was a slight convulsion. On the 17th, there was coma, with some squinting; the pulse below the natural standard. On the 18th, the pulse began to rise, and the coma was diminished. On the 19th and 20th, 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 30th day of the disease. The pulse had

risen to 120, and in the last week there had been some slight return of convulsion.

Inspection.—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 LXIV.—A gentleman, aged 24, was affected with slight headach, and unusual listlessness and inactivity. 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 delirium. After a few days more, the delirium again subsided, and great hopes were entertained of his recovery; but the delirium 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 this patient during his life, but was present at the examination of the body.

Inspection.—All the ventricles of the brain were found distended with clear serous fluid, without any other morbid appearance.

The pathology of cases of this kind is perhaps the more obscure than that of the cases formerly referred to; but that, in these cases likewise, the effusion arises from a low degree of inflammatory action in the brain, is probable from the fact, that similar appearances are occa-

sionally met with in those instances in which the disease supervenes upon injuries of the head, as in the following cases.

CASE LXV.—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, with vomiting, and slight fever; after a few days, he became oppressed, then comatose, and died at the end of the second week.

Inspection.—All the ventricles of the brain were found distended with serous fluid, without any other morbid appearance.

CASE LXVI.—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, but was followed by slight delirium, and this by coma. She lay in a state of coma for five or six days, and then died, two months after the fall.

Inspection.—All the ventricles of the brain were found distended with serous fluid, without any other morbid appearance.

A general review of this important subject seems to lead to some results of much practical importance in the pathology of affections of the brain, particularly in regard to that class of them which terminate by effusion. There are many facts on record, which show us the presence of fluid in the brain in large quantity, without any alarming symptom having resulted from it. Morgagni found eight ounces in a man who died suddenly of suffocation

in an advanced stage of pneumonia; and Dr. Heberden found the same quantity in a man who died suddenly, after being weakened by a febrile attack, without any symptom of an affection of the brain. It is therefore not the mere presence of a certain quantity of fluid in the brain, that gives rise to the symptoms of hydrocephalus; and, on the other hand, we have seen a disease go through all the usual symptoms of hydrocephalus, and terminate fatally without any effusion. The fair conclusion from these facts appears to be, that the prominent symptoms in these cases are not the result of the effusion, but of that disease of the brain of which the effusion is one of the terminations. From a variety of facts which have been adduced, there seems little reason to doubt that this disease is of an inflammatory nature. If these conclusions shall be considered as well founded, it will follow, that our practice ought to be directed principally to subduing the inflammation at its earliest period, and preventing it from passing into effusion, and particularly from passing into ramollissement, which we have seen to be a fatal termination of the disease, even though of small extent and without any effusion. This termination, I think, we have every reason to consider as the result most to be dreaded in this class of the inflammatory diseases of the brain; for in regard to the mere effusion, were the parts otherwise in a healthy state, there does not seem to be any very satisfactory reason for considering it as a hopeless affection. In other words, I mean to submit, that we have no good reason for doubting the possibility of serous fluid being absorbed from the ventricles of the brain. We are warranted in this supposition, both by the analogy of other serous cavities, and by what we actually see take place in the brain itself. In the other serous cavities, we have every reason to believe, that there is constantly going on an absorption of the old fluid, and a deposition of new fluid in its place; and we see them in a state of disease, relieve themselves by an increased absorption from an excess of fluid which has been deposited. The ventricles of the brain are unquestionably to be considered as se-

rous cavities; and there seems to be no good reason for considering them as differing in their functions from the other cavities of the same kind, whatever the particular apparatus may be by which the function is carried on. In regard to the actual existence of absorption in the brain, we have the most satisfactory proof, in the gradual disappearance of coagula of blood, both from the surface and from the ventricles, and from cavities in the substance of the brain. Upon the whole, I think we have sufficient ground for receiving the following conclusions in regard to this class of affections of the head.

1st, That in the ordinary cases of hydrocephalus, the coma and other symptoms attending it 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.

2d, 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, squinting, double vision, dilated pupil, paralytic symptoms, and perfect coma, we have seen may exist without any effusion.

3d, That all these symptoms may exist in connexion 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 at an early period, we have the prospect of arresting its progress in a considerable proportion of cases. The ground of prognosis in particular cases depends perhaps in a great measure upon the activity of the symptoms. The more they approach to the character of active inflammation, our prospect of cutting them short will be the greater; and the more they partake of the low 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.

These principles bear immediately upon the question, Has hydrocephalus been cured? There is no doubt that many cases have recovered, which exhibited all the usual

symptoms of it, several examples of which will be mentioned in the sequel. Such cases have by some 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 principles now referred to be admitted, we shall see reason to believe, that we have no certain rule by which we can decide upon the presence of effusion in the brain; but that all the symptoms usually attending it exist in connexion with an inflammatory condition of the brain, which, if allowed to go on, would probably lead to effusion, but which, if treated with decision in its early stage, may, in a certain proportion of cases, be treated with success. Whether the fluid can be absorbed, or the disease cured, after effusion has taken place, must remain matter of conjecture; but, from the facts which have been adduced, we have every reason to believe, that, in the ordinary cases of hydrocephalus, the removal of the fluid, if it did take place, would in no respect improve the situation of the patient,—because there would still remain that deep-seated disease of the central parts of the brain, which accompanies the effusion in so large a proportion of cases, and which we have seen may be fatal without any effusion, yet with all the usual symptoms of hydrocephalus.

SECTION VII.

OF THE CAUSES OF THE INFLAMMATORY AFFECTIONS OF THE BRAIN.

In a great proportion of the cases of the inflammatory affections of the brain, the causes elude our observation; the circumstances under which they most frequently occur, are chiefly the following:

I. They often appear in the course of other febrile diseases, as continued fever, scarlatina, measles, &c. One of the most frequent and most severe examples of the disease arising from this source, is an affection which supervenes upon scarlatina. A child recovering from scarlatina, which may have been in a mild form, is seized, perhaps after some exposure to cold, with headach, which after a short time is followed by convulsion, and this by blindness and coma. These symptoms may have been preceded by the anasarca which frequently supervenes upon scarlatina, and on that account, are apt to be ascribed to sudden effusion in the brain; but the disease is entirely inflammatory, and the patient can be saved only by the most vigorous treatment,—by bloodletting, purgatives, and other similar remedies. Upon this plan, many such cases recover; others die and present the usual appearances of the inflammatory affections of the brain; and some of those who have recovered from the affection, have been afterwards liable to epileptic paroxysms. A similar disease occurs in continued fever, especially in the more advanced stages of it. If it has come on gradually and insidiously, it is generally hopeless; if it be in a more acute form, the patient may frequently be saved by active treatment. In connexion with low and protracted fever, however, a condition frequently occurs, which puts on many characters of the most dangerous affections of the brain, but these pass off when the fever subsides. A boy, between 4 and 5, whom I saw with Dr. Begbie, with much of the character of low fever, had stupor followed by dilated pupil and blindness with some squinting; he then had loss of speech; and after lying completely speechless for nearly a month gradually recovered. The blindness continued only six days: the recovery of his speech was preceded by copious discharge of matter from both his ears. About three months after, he died in the country of a head affection, and tubercular disease was found in the brain, with effusion. In another case, in an adult, which terminated favourably, there was for several days nearly perfect coma, with that spasmodic rigidity of

some of the limbs, which the French have considered as characteristic of ramollissement of the brain.

II. They may follow injuries, and this perhaps is a more frequent cause of the affections than we are generally aware of, especially in children; the injury being often slight, and the interval very considerable betwixt it and the appearance of any alarming symptoms. I have given two remarkable examples which seem to be referable to this head in Cases LXV. and LXVI.

III. Suppressed evacuations. One of the most common examples of this is suppression of the menses, which in young women of unsound constitution is very often followed by dangerous affections of the brain. Headach, or any symptom in the head occurring under such circumstances, is always to be considered as requiring most minute attention. Case LVIII. affords an interesting example of the disease coming on in this manner, and running its course with a very remarkable train of symptoms. Another affection which seems to be referable to this head, is that effusion in the brain which is apt to supervene upon urinary disorders, particularly on that remarkable affection, the Ischuria Renalis. In this obscure disease, the prominent symptom is a very sudden diminution of the secretion of urine, amounting frequently almost to a complete suspension of it. Generally about the third day from the occurrence of this symptom, the patient is found passing into a state of coma, in which after a few days more he dies. The ventricles of the brain are found distended with fluid. In the following singular case, the same symptoms supervened upon another and rather uncommon modification of the disease, namely, Ischuria Uretalis.

Case LXVII.—A gentleman, aged 70, (in February 1816,) 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 once or twice, when closely questioned, of slight uneasiness in his back. On the seventh day, he had slight confusion of thought, and indistinctness of speech. On the 9th, he became comatose, and died on the 13th. On dissection, extensive effusion was found in the ventricles of the brain; the bladder was empty. Both kidnies were distended with urine. Both ureters were completely obstructed by large caluli, the one immediately at its upper extremity, the other about three inches below the kidney.

IV. The affections often occur in connexion with disease of a chronic or scrofulous character in other parts of the body. The most frequent example of this is, the brain becoming affected in the advanced stages of phthisis. Of this I have given several examples, and I have seen many more, assuming various characters. In one of them, the head symptoms began a month before death, with attacks of loss of speech, which continued only a few minutes at a time, and were accompanied by a sensation of prickling and numbness of the right side of the face. After the patient had been liable to these attacks for a fortnight, he had headach and slight delirium, followed by stupor, which was fatal in another fortnight. In another man, aged 32, who had been ill five weeks with severe pulmonary complaints, the first symptom was double vision, without headach. He complained of dysuria, and his pulse was irregular.

In such cases the first disease is not properly to be considered as the cause of the head affection. It merely marks the tendency to inflammation of a chronic or scrofulous character; and, in habits so disposed, the affection of the brain may be excited by causes which elude our observation. On the same principle, disease in the brain may appear in connexion with disease of any other organ, especially in unhealthy children. In such cases the liver has often been found diseased; and, founded upon this observation, diseased liver has been improperly stated as one of the causes of hydrocephalus. The same observation perhaps applies to worms and

various other affections of the bowels, which in unhealthy children are often found to accompany hydrocephalus, and have sometimes been considered in the relation of a cause. Some of the more acute affections of the bowels, however, seem to be entitled to more attention, though the connexion betwixt them and the affections of the brain is very obscure. In some of them, it perhaps merely arises out of the general febrile excitement of the system; but, in others, there seems to be a connexion distinct from this. One of the most remarkable examples is in the inflammation of the mucous membrane of the bowels, which occurs in young children of the age of from eight to twelve months. This affection frequently terminates by coma, and the coma appears to be frequently preceded by a remarkable diminution of the secretion of urine. I have elswhere thrown out a conjecture that this disease, in its relation to the affection of the brain, bears an analogy to ischuria renalis, but perhaps the connexion in both cases is equally obscure.

In the dissection of cases of hydrocephalus in young children, we very often meet with intus-susceptio in the bowels, and it generally exists in several places. I have repeatedly seen six or seven of them, and in one case fourteen. They appear in general to be quite recent, being free from inflammation or thickening of the parts; and in the cases which occurred to me, there did not exist any unusual obstinacy of the bowels. The affection, therefore, is probably to be considered as recent and incidental; or perhaps, as arising out of an inversion or derangement of the peristaltic motion of the bowels. This may be produced by the affection of the brain in the same manner as we see urgent vomiting connected with it. In some cases, however, the intus-susceptio appears to have been of longer standing, and to have preceded the affection of the brain. A girl, aged 6 years, mentioned by Dr. Coindet,* had severe pain in the belly, vomiting, and constipation; on the fifth day,

* Coindet, Memoire sur l'Hydrencephale.

head symptoms appeared, and she died on the 12th. Much effusion was found in the brain, and there was an extensive intus-susceptio in the ileum, where a portion of intestine, six or seven inches long, was inflamed and thickened.

V. Various other causes might be mentioned, such as passions of the mind, stimulating liquors, &c.; but I shall not enter upon these, and shall only add one which is of frequent occurrence, and presents some singular phenomena, namely, exposure to the intense heat of the sun. It appears that in some cases of this kind, the membranes are chiefly affected, and in others the substance of the brain. Sometimes an apopletic state is produced, which is fatal in a few hours; but, more frequently, an affection of an inflammatory nature, occasionally assuming the character of mania; and in others, paralytic symptoms occur at an early period followed by coma. The affection of course is chiefly a disease of warm climates, but also occurs in this country, as in the following case, for which I am indebted to Mr. Clarkson, surgeon in Selkirk.

Case LXVIII.—A young man, aged 15, on the 5th of June 1818, bathed twice in the river Tweed. After coming out the second time, he lay down on the bank and fell asleep without his hat, exposed to the intense heat of the sun. On awaking, he was speechless, but walked home, and seemed to be otherwise in good health. He was bled and purged, and next day recovered his speech, but lost it again at intervals several times during the three or four following days. He was forgetful, and his look was dull and heavy; he made little complaint, but, when closely questioned, said he had a dull uneasiness in the back part of his head. After a few days more, he had squinting and double vision, with a very obstinate state of bowels, and his pulse was 60. After farther bleeding, &c. the pulse rose to 86, but he sunk gradually into coma, and died on the 30th.

Inspection.—The substance of the brain in general seemed highly vascular, and a very considerable extent of it was in a state of ramollissement mixed with suppuration. The ventricles were distended with fluid, and the membranes in many places were much thickened. The inner surface of the cranium was very unequal at the upper part, and one spot, the size of a sixpence, was as thin as writing paper, and transparent.

SECTION VIII.

OF THE TREATMENT OF THE INFLAMMATORY AFFECTIONS OF THE BRAIN.

In the treatment of this important class of diseases the remedies are few and simple; but every thing depends upon the use of them being adopted at an early period, and in the most decided manner. Those on which we chiefly rely are bloodletting, general and topical, active purgatives, and cold applications to the head. Benefit is also derived from antimonials, and in some states of the disease from digitalis. The effect of blistering in the early stages is rather ambiguous. When it is employed, it should perhaps be on the back part of the head and neck; in these situations it is probably more likely to be useful than on the upper part of the head, while it does not interfere with a more powerful remedy, the application of cold. After the first activity of the disease has been subdued, blisters applied in succession to various parts of the head, and the upper part of the spine, appear to be in many cases extremely useful. Mercury has been strongly recommended in that class of cases which terminate by hydrocephalus, but its reputation seems to stand upon very doubtful grounds. In many cases, especially during the first or more active stage, the indis-

criminate employment of mercury must be injurious. In the adaptation of the particular remedies to individual cases, we must of course be regulated by the age and habit of the patient, and particularly by the character of the disease in regard to activity. In those cases which assume the more acute or active forms, general bloodletting must be used in the most decided manner: while in the cases which assume a more chronic character, as many of the common cases of hydrocephalus, it has less control over the disease, and is not borne to the same extent. In all the forms of the disease, active purging appears to be the remedy from which we find the most satisfactory results; and although bloodletting is never to be neglected in the earlier stages of the disease, my own experience is, that more recoveries from head affections of the most alarming aspect take place under the use of very strong purging, than under any other mode of treatment. In most of these cases indeed full and repeated bleeding had been previously employed, but without any apparent effect in arresting the symptoms. The most convenient medicine for this purpose is the croton oil. In regard to local remedies, by far the most powerful is the application of cold. It may be applied in a continued manner by means of a bladder containing pounded ice mixed with a small quantity of water: but a still more effectual mode of applying it in the more acute cases, is by a stream of cold water directed against the crown of the head and continued for a considerable time, untill the full effect be produced from it. Applied in this manner, it is a remedy of such power, that it requires to be used with much discretion. Under the operation of it, I have seen a strong man thrown, in a very few minutes, into a state approaching to asphyxia, who immediately before had been in the highest state of maniacal excitement, with morbid increase of strength, defeating every attempt of four or five men to restrain him. The following case shows the immediate effect of it in another modification of the disease. A strong plethoric child, aged five years,

after being one day feverish, oppressed and restless, fell rather suddenly into a state of perfect coma. She had been in this state about an hour when I saw her; she lay stretched on her back, motionless and completely insensible; her face 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; and it appears to be much more useful in such cases than the warm bath, the indiscriminate employment of which is often decidedly injurious.

In the preceding observations, I shall perhaps be considered as having attached too little importance to mercury in the treatment of this class of diseases, particularly in the treatment of hydrocephalus; but in doing so, I have stated simply what is the result of an extensive observation. When mercury was first employed as a remedy for hydrocephalus, it was given with a view to promote the absorption of the effused fluid, which was supposed to constitute the essence of the disease; it is now given to correct the biliary secretion, and the functions of the digestive organs, which, according to certain modern doctrines, hold so prominent a place in almost every class of diseases. In affections of the brain, as in all other diseases, it is highly proper that these secretions should be attended to, but it is not thus that we are to expect to cure hydrocephalus; and I confess the result of my own observation is, that when mercury is useful in affections of the brain, it is chiefly as a purgative.

Under the treatment which I have now mentioned, I have seen many cases recover which exhibited all the usual symptoms of the most dangerous affections of the brain, and even the most advanced stages of them. The cases which thus terminate favourably form, it must be confessed, but a small proportion of

those which come under the view of a physician of considerable practice; but they hold out every encouragement to persevere in the treatment of a class of diseases, which, after a certain period of their progress, we are too apt to consider as hopeless. I shall conclude this part of the subject by a selection of cases illustrating the favourable termination of the disease in various forms, and under the most unpromising circumstances. Some of these will show the affection arrested in the early or acute stage, while others will illustrate the favourable termination of it with the symptoms which have usually been considered as characteristic of the more advanced period, in which the affection is generally considered as hopeless. When these cases are compared with the fatal cases which have already been described, there will, I think, appear to be every reason for considering them as fair examples of this dangerous affection of the brain.

Case LXIX.—A girl, aged 11, had violent headach and vomiting, with great obstinacy of the bowels, and these symptoms were followed by dilated pupil, and a degree of stupor bordering upon perfect coma; pulse 130. She 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 freely acted upon by the medicines which they had formerly resisted; and in a few days she was quite well.

Case LXX.—A slender and delicate girl, aged 11, had scarlatina in a favourable form in the beginning of April, 1820. About the 16th, she was so much recovered as to be allowed to go about the house. A few days after this, she was affected with anasarca, for which she took some medicine with partial benefit. About the 26th, however, the anasarca had again increased considerably, especially in the face, which was very much swelled. In the following night she had vomiting.

On the 27th, she complained of headach, which increased rapidly in violence; towards the afternoon, she became delirious, the pulse very frequent, about 160. Soon after this she was seized with violent and general convulsion, which recurred very frequently through the early part of the night, leaving her in a state of profound coma. The treatment adopted during the course of these symptoms was repeated general bleeding, to the amount of 28 ounces, followed by topical bleeding, purgatives, antimonial solution, &c. Towards midnight the convulsions ceased, and sometime afterwards she gradually recovered from the coma. On the 28th, she was free from any alarming symptom during the early part of the day; pulse about 108. In the evening she was seized with severe symptoms of pneumonia, on account of which she was bled during the next 24 hours to the amount of upwards of 30 ounces, besides bleeding with leeches and the other usual remedies. In a few days more she was restored to perfect health.

Case LXXI.—A young man, aged 16, in the beginning of October 1823, had cough with severe dyspnœa, for which he was freely bled from the arm with much relief, and on the morning of the 10th, he was considered as convalescent. In the evening of that day he had headach and some vomiting. About midnight, having got out of bed to go to stool, he fell down in a state of violent and general convulsion. The convulsion returned during the night six or seven times with such violence that one of the attacks continued without intermission for about an hour. The pulse during the night varied from 60 to 120. At first it was found impossible to bleed him on account of the violence of the convulsions, but about 7 in the morning a full bleeding was obtained, though with some difficulty, after which the convulsions ceased, except some slighter attacks during the day, which appeared to be arrested by pouring cold water over his head. During the 11th, he was oppressed, with occasional tremors of the limbs and some vomiting, and he had one or two threatenings of

convulsion; pulse about 80 and soft; he took repeated doses of active purgatives with little effect, and on the morning of the 12th he appeared to be sinking into a state of perfect coma; pulse 50. Croton oil was now given, which operated powerfully seven or eight times. He passed a good night, and on the 13th was free from complaint. This very important case was under the care of Dr. Huie. I saw the patient along with him from mid-day of the 11th.

Case LXXII.—A gentleman, aged 21, was first affected with confusion of thought and very considerable loss of recollection. He then complained of headach, and after a day or two had double vision, the two objects being placed the one above the other. At this time he was out of bed the greater part of the day, but was restless and confused, and at times incoherent. He was then confined to bed, and had constant headach, much incoherence and oppression, the double vision continuing. The pulse was at first frequent, but fell gradually, and sunk below the natural standard; and the symptoms went through a course exactly similar to that which has been described in many of the fatal cases. As the pulse fell in frequency, he became more and more oppressed, until he sunk into a state of stupor, from which he could scarcely be roused so as to answer a question of the most simple kind. The case went on in this manner for eight or ten days, during which time he was treated by repeated general and topical bleeding, cold applications, blistering, &c. without the smallest effect in arresting the progress of the symptoms. The bowels were very obstinate, and large doses of the most active purgatives were given with little effect. He seemed to be on the brink of perfect coma, and the case was considered as desperate, when he began to take the croton oil, in full doses, repeated every two or three hours. In a few hours, he was purged very actively nine or ten times; the same evening he was relieved from every alarming symptom, and in a few days was free from complaint.

Case LXXIII.—A girl, aged 2 years and 3 months, previously very strong and healthy, had recently recovered from measles, when about the 7th July 1821, she suddenly lost the power of both her lower extremities. She continued without any improvement, but without any further symptom, till the beginning of August, when she became affected with squinting and drowsiness, and her countenance was expressive of fatuity. On the 7th, she was seized with smart fever, urgent vomiting, and frequent slight convulsions; the face flushed, the pulse strong and frequent. She was treated by Dr. Begbie, by bleeding and purgatives; and on the 8th, she was considerably relieved. On the 9th, however, the symptoms returned, with stupor bordering upon coma, oppressed breathing, and dilated pupil. The squinting continued, with complete palsy of the lower extremities. Farther bleeding with leeches was now employed, and active purgatives, followed by blistering on the neck, and under this treatment the more urgent symptoms speedily disappeared. The palsy of the lower extremities then subsided gradually, and was entirely removed in about three weeks.

Case LXXIV.—A lady, aged 45, after the menses had ceased for four months, was seized with headach, sense of weight in the head, much oppression and double vision: the pulse was at first 72, but soon rose to 100. On the first day, she was bled to twenty-eight ounces, with little relief. On the 2d, topical bleeding, blistering, and smart purging were used, but the symptoms continued unabated. On the 3d day, another bleeding of twenty ounces gave a turn to the complaint, and in a few days more, with brisk 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 to each other, but it was not entirely gone for nearly a fortnight.

Case LXXV.—A girl, aged 7, had severe headach, impatience of light, fever and slight delirium, followed

by stupor, squinting, and great obstinacy of the bowels. The tongue was at first foul, but became clean after a day or two. Topical bleeding and blistering were employed, with various active purgatives, which produced little effect; and the symptoms continued unabated for a week, during which she was considered as being in a hopeless state of hydrocephalus. At the end of the week, strong purging being produced, she recovered rapidly, and in a few days was free from complaint.

Case LXXVI.—A young lady, aged 11, of a family in which several had died of hydrocephalus, on September 21, 1817, had severe headach, giddiness, and much vomiting; the pulse natural. After topical bleeding and purgatives, she was relieved on the 22d. On the 23d, she still complained of headach, and the pulse fell to 60. On the 24th, the pulse fell to 50; there was much headach, with great oppression approaching to coma, and dilatation of the pupil. Two bleedings from the arm were now employed with much relief; the second produced syncope. On the 25th, the pulse was from 80 to 90, and all the symptoms were relieved. The complaint then subsided under the use of purgatives and cold applications; and in five or six days more she was in her usual health.

Case LXXVII.—A lady, aged 15, had violent headach for several days, with impatience of light, followed by transient fits of delirium; and this by squinting, double vision, and stupor bordering upon coma; the bowels very obstinate, with occasional vomiting. The pulse was very variable, being sometimes extremely frequent, and at other times little above the natural standard. There occurred paroxysms of violent aggravation of the pain, which produced screaming and agitation of the whole body, and at times there was a threatening of convulsion. This very violent case was treated by repeated general and topical bleeding, blistering, purgatives, and mercury given so as 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 treated 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 LXXVIII.—A lady, aged 21, in 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 fits of delirium, and stupor bordering upon coma, and the pulse rose again to 120. In this state she continued a fortnight, with every appearance of an affection of the brain of the most formidable character, and without being at all relieved by the remedies which were employed, namely, repeated topical bleeding, blistering, and large doses of calomel. The calomel did not affect the mouth, and had very little effect upon 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 she was free from stupor, and the headach was much relieved. In five or six days more she was well.

Case LXXIX.—A gentleman, 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. On the 14th, there was increase of stupor; pulse 86; the tongue clean; the skin cool. On the 16th, there was much incoherent talking and unmanageable delirium; after which the stupor again increased, the pulse continuing about 84. On the 19th, there was partial relief after smart purging; but on the 20th, the stupor had returned as before, and by the 22d, had increased to perfect coma; the pulse about

100. He now lay in a state of perfect coma for four days, during which time various medicines were given with difficulty, and with little effect upon his bowels. On the 27th, purging was at last produced to the extent of fourteen evacuations in the course of the day, with complete relief of all his symptoms. On the 28th, there was some delirium, which subsided in another day. For a week he continued to complain of some headach, and a feeling of weight in his head; but, by the 10th of March, he was free from complaint.

To these cases, as they stood in the former edition, I shall only add the following, which presents some features of much interest.

Case LXXX.—A boy aged 12, the son of a medical friend, had scarlatina mildly in the spring of 1833. Nearly a month after, he was affected with slight anasarca of the face, and after this had continued several days, he had some vomiting, and appeared languid. About a week after the appearance of the anasarca, he complained one morning of headach, and had some vomiting; pulse slow and rather languid. About eleven o'clock in the forenoon, he suddenly lost his sight; and towards the afternoon, he passed into a state bordering on coma. He still complained of headach, but the pulse was not above the natural standard, soft and languid. Topical bleeding having been employed without relief, I saw him at night, and advised general bleeding to ℥xii to be followed by active purging, and cold applications to the head. During the bleeding the pulse rose both in strength and frequency. Next morning I found him quite sensible, but entirely blind; there was still some headach, but less than formerly, and the pulse was stronger, and not frequent. He was again bled to ℥xii, and the purgatives repeated. After five or six evacuations from the bowels, his sight began to return, and in the evening was entirely restored. Next day he was free from complaint, and has ever since enjoyed good health.

APPENDIX

TO

PART FIRST.

THE preceding observations conclude the present imperfect outline of the first part of our subject, THE INFLAMMATORY AFFECTIONS OF THE BRAIN. Before proceeding to the second part, I shall introduce in this place a few observations upon certain affections, which are most allied to the first class, and in a practical point of view are often objects of very great interest; they are referable to the following heads:

I. Tubercular Disease of the Brain.
II. Certain Affections of the Bones of the Cranium.
III. Certain Affections of the Pericranium.

SECT. I.

OF TUBERCULAR DISEASE OF THE BRAIN.

WHEN we have an opportunity of observing tubercles in the brain in their early stages, in consequence of the patient having died of some other disease, we find them presenting the same characters as in other parts of the body. They are generally solid bodies, of firm consistence, and whitish colour, varying from the size of a pin head, or a small pea, to that of a walnut or a small egg. We find them in every part of the brain, either embedded in its substance, lying on the surface, or attached to the membranes. When they have attained a considerable size, they present, when cut into, the usual whitish-coloured or cheesy matter generally enclosed in a cyst;

and in the fatal cases, we find them more or less approaching to a softened state, or partial unhealthy suppuration. They occur in persons and in families, in whom a tendency to tubercular disease has otherwise manifested itself; and they are very often combined with tubercular disease in other organs. This is remarkably exemplified in the first of the following cases, in which all the three great cavities were at once extensively affected.

The symptoms accompanying tubercular disease of the brain, in its early stages, are often exceedingly obscure and variable; perhaps little more than a tendency to headach, which assumes no formidable character, or sometimes assumes the appearance of what has been called the periodical headach, or the sick headach. The symptoms may go on for a long time in this manner without exciting any alarm, until the disease suddenly assumes a more active character, and is speedily fatal. This termination seems in general to be connected with inflammatory action of the cerebral substance; and we find upon dissection, either extensive effusion or extensive ramollissement of that part of the brain in which the principal tubercular masses are situated. In other cases, we have every proof that masses of a very large size had existed without producing any symptoms, until an attack took place which went through the usual course of hydrocephalus. Examples of tubercular disease in the brain have already occurred in connexion with some of the diseases formerly referred to. I add the following cases as illustrating the affection in its more pure and simple form.

Case LXXXI.—A young lady, aged 15, fell into bad health in the beginning of the year 1822, complaining at that time chiefly of pain in the bowels, with bad appetite; and she became languid and sallow. She went through the usual course of treatment for such affections, under the care of Mr. William Wood, with apparent benefit; but after some time she began to have cough, with uneasiness in the chest, and these symp-

toms then became the object of attention. Some time after this she began to complain of headach, for which she was treated with topical bleeding and blistering, and again experienced relief. In this manner, she went on for several weeks more, complaining sometimes of her belly, sometimes of her breast, and sometimes of her head. The pain was never severe in any of these situations, but she was seldom without uneasiness in one or other of them. Her bowels at first had been rather loose, but afterwards were natural, or easily kept open by mild medicines. When I saw her along with Mr. Wood, in the beginning of March, she was considerably reduced in flesh and strength; she was confined to the house, but able to be up and dressed during the day. She had a small frequent pulse, little appetite, some cough, and occasional uneasiness in the chest; there was frequent pain in the head, and febrile flushings took place in the evening. She now made little complaint of her bowels, which were easily kept open, and the stools were natural. It was evident that there was disease in all the three cavities, though it was doubtful in which of them it was to assume the fatal character, until the 15th March, when the headach became more severe, so as to confine her to bed. It then went on in the usual manner with dilated pupil, squinting and coma; and she died on the 20th.

Inspection.—The ventricles of the brain were distended with fluid. In the substance of the right hemisphere, there was a tubercular mass of considerable size, partly softened; and there were several smaller masses of the same kind in the substance of the cerebellum. The lungs were studded throughout with innumerable small tubercles, all in the solid state. The abdomen presented a most extensive mass of disease, the whole of the intestines being agglutinated together by adhesion; and the mass thus formed likewise adhered extensively to the parietes of the abdomen and to the omentum.

CASE LXXXII.—A young lady, aged 18, had en-

joyed good health, except from a scrofulous sore on the left arm, till about the middle of February 1822, when she began to complain of headach. There was fever, with oppression and loaded tongue; and the headach became so severe, that Sir George Ballingall was induced to treat her in the most active manner by general and topical bloodletting, &c. When I saw her along with him, about the end of the first week of her illness, she had still much headach, with a look of great oppression, but was quite sensible. The pain was chiefly referred to the back of the head and neck, and was much aggravated by motion, even by being raised up in bed in the most gentle manner. The tongue was covered with a dense white crust, and the pulse was frequent and rather weak. After farther topical bleeding, purgatives, &c., there was a gradual improvement; and at the end of the second week, the tongue was clean, and the look of oppression and stupor was gone. But though her general aspect was now greatly improved, she was not free from uneasiness in the head, and she did not recover strength. After an interval of partial relief, the headach again increased, with a look of much languor and oppression. After continuing a few days in this state, she died rather suddenly. At the morning visit of the day in which she died, she appeared sensible to every impression, and answered questions distinctly when roused. Her death took place about five weeks after the original attack.

Inspection.—There was considerable effusion in the ventricles of the brain. In the substance of the right hemisphere, there was a soft tubercular mass of large size; and there was considerable ramollissement of the cerebral substance surrounding it. There were two smaller tumors of the same kind in the cerebellum. There were numerous tubercles in the lungs not suppurated. There was much disease of the uterus and ovaria, which were considerably enlarged; and the Fallopian tubes, in particular, were very much enlarged, and distended with a soft cheesy matter of a yellow colour.

In this case it seems probable that the attack of the middle of February was continued fever, and that the disease in the brain was thereby excited into action and hurried on to a fatal termination.

Case LXXXIII.—A boy, aged 9, in January, 1821, began to complain of headach. It was usually accompanied with pain about the umbilicus, and attacked him daily, the attack commonly continuing from half an hour to two or three hours. The headach at first came on about two o'clock in the morning, and generally continued about one hour, but the period of its duration was gradually extended to three or four hours. The period of attack also gradually became later, until it advanced progressively to five in the afternoon; it did not become later than this. The attack usually occurred every day, and generally went off with vomiting. During the attack, the pain was most violent, so as to incapacitate him from any exertion; but during the rest of the day, he was lively and playful, and made no complaint. He went on in this manner for six months. In the beginning of July, he was seized with fever and pain in the bowels, and was confined to bed. The headach now became constant, and there was frequent vomiting. After some days the vomiting ceased, but he continued to have fever, with considerable permanent headach; and at the end of a fortnight from the commencement of the febrile attack, he died rather suddenly without coma or any affection of the senses.

Inspection.—The brain was quite healthy, and there was no effusion in the ventricles. In the left lobe of the cerebellum, there were two tubercular masses, the size of large hazel nuts; and there was another similar tumor betwixt the two lobes; they were round and firm, and internally presented a yellowish cheesy consistence. In the thorax, there was extensive adhesion, but the substance of the lungs was tolerably healthy. In the abdomen there were slight adhesions of the viscera.

Case LXXXIV.—A child, aged 3 years, of a family who had suffered much from various forms of chronic disease, had been for some months affected with a moveable swelling on the arm, of a strumous character, and was liable to discharge of matter from the left ear. He was otherwise in good health until the beginning of April, 1827, when he was observed to have a peculiar unsteadiness in his limbs in walking, and a peculiar want of control over his arms in attempting to lay hold of any object. From this time he showed a disinclination to walk, but no other symptom was taken notice of till the middle of May, when he complained of pain in the back of his head, especially in the left side behind the ear. He was now confined to bed, and was fretful and feverish. On the third day from the commencement of these symptoms, he began to squint, and about the same time to be affected with convulsive attacks, which generally occurred three or four times in a day; they affected at first the whole body, but afterwards were confined to the right side, and were generally accompanied by distortion of the eyes, and a degree of stupor, which however was of short continuance; his pulse was generally about 120. He lived in this state for twelve days, and no particular change of symptoms took place, except that a few days before death the pupils became dilated and insensible. He appeared to be comatose only on the last day of his life, having continued till that time to be sensible to every thing, and to take his food readily. I saw him along with Mr. Macfarlane, and all the usual remedies were employed without relief.

Inspection.—There was considerable effusion in the ventricles: the brain was in other respects healthy. In the posterior part of the cerebellum there were two tubercles the size of large walnuts. They were situated one in each lobe, and completely imbedded in the substance of the cerebellum. Externally they were firm and of a yellow colour; internally they showed the usual appearance of unhealthy suppuration; there was extensive ramollissement in the substance of the cere-

bellum ; and there was extensive effusion in the spinal canal, both betwixt the bones and the dura mater of the cord, and betwixt that membrane and the pia mater. The substance of the cord seemed much softer than natural, especially at the upper part, where in consequence of its softness it had given way in opening the spine.

On the subject of tubercular disease in the cerebellum, I shall only add the following remarkable case, showing in a very striking manner, the remissions which take place in the symptoms in diseases of this class, and the periodical character which they sometimes assume.

Case LXXXV.—A gentleman aged 34, in the year 1825 first began to be affected with occasional attacks of headach, which were usually accompanied by vertigo and dimness of sight. In 1827, the pain became more severe, and was distinctly referred to the occiput and superior part of the neck. He had generally remission of it through the day, and aggravations in the evening. In the spring of 1828, the symptoms increased in severity, but he received considerable relief from blistering. In the summer he went to the country, where his general health was much improved, and his headach greatly mitigated. He continued in this improved state till May 1829, when the attacks of headach were again aggravated, accompanied by giddiness, and on one occasion he fell from his chair. In October of the same year, he began to be affected by a most distressing sensation of throbbing referred to the back part of the head ; and he was also affected with vomiting, which continued without intermission for three weeks. The paroxysms of headach were now aggravated to an intense degree of severity. They occurred chiefly in the evening, from six o'clock till midnight,—but also at other times of the day. During the more severe attacks, his face was flushed,—the vessels on the temples were remarkably distended, and he lay in a state nearly of unconsciousness, unable to

speak, and with his hands and arms spasmodically contracted. He still had occasional vomiting and intense acidity of the stomach, and several times complained of double vision. The pulse was generally natural. His situation was now considered as nearly hopeless; and no relief was obtained from any remedies; but after five or six weeks of intense suffering, the symptoms gradually remitted, and during several weeks in December and January, he continued almost free from headach; he was able to walk out, and his general health was greatly improved. In February 1830 the symptoms again increased; but the pain was now chiefly complained of above the eyes;—the remissions also were more complete, and upon the whole his sufferings were less severe than during the attack in November. In March, his complaints again subsided, and he was able to take a good deal of exercise in the open air, and to attend a good deal to his business. He had still occasional attacks of headach, but they were not severe, and his condition was considered as much more favourable than it had been for a long time. In the middle of April, the paroxysms of headach became more severe, but by no means in the degree in which they had occurred on former occasions. He was not confined; and no degree of apprehension was excited until the 24th, when, in one of those paroxysms, he suddenly expired.

Inspection.—The ventricles of the brain contained from three to four ounces of limpid fluid; but the surrounding parts were entirely healthy. Imbedded in the substance of the left lobe of the cerebellum there was a tubercular mass, the shape and size of a very small walnut. Externally it was firm, and presented the usual appearance of the scrofulous tubercle; internally it was softened, with the common appearance of unhealthy scrofulous suppuration. The substance of the cerebellum around it was entirely healthy. No other appearance of disease was discovered in the head; and the other viscera were sound.

The following case, for which I am indebted to Dr. Combe, of Leith, while it affords a good example of tubercular disease of the brain, is interesting from the singular coincidence of the two forms of paralysis, on the opposite sides of the face; the one connected with the division of the portio dura, the other with the disease in the brain.

Case LXXXVI.—A man, aged 36, about a year before his death, had a tumor extirpated from behind the angle of the jaw, on the left side, and immediately after the operation, paralysis took place in the left side of the face, in consequence of which his mouth was distorted to the opposite side in a most extraordinary degree. About six months after this, he began to complain of headach, and giddiness, which often gave him the appearance of intoxication, and after some time these symptoms were followed by impaired vision, occasional strabismus, and a considerable degree of deafness; and at last by drowsiness, coma, convulsions, and death. As these symptoms advanced, he became affected with numbness, and loss of power of the right side of the face, which increased very gradually. During the increase of this, the distortion of his mouth gradually diminished, and for some time before his death, his countenance had become entirely symmetrical. Both sides of his face were now entirely paralytic, but with this difference, that on the right side, the feeling was also lost, while on the left the feeling was entire.

Inspection.—In the centre of the middle lobe of the right hemisphere of the brain, there was a tubercle about an inch long, and three-fourths of an inch in breadth. At its lower part it was attached to the cerebral substance, but the rest of it was detached, being surrounded with dark-coloured pus. In the vicinity there was increased vascularity with softening of the cerebral substance.

I shall only add on this subject one remarkable case of a tubercular mass of very great size attached to the

falx, which must have existed for a long time without producing any symptoms.

Case LXXXVII.—A boy, aged 7, had been for more than a year affected with scrofulous sores, and during that time had been in a declining state of health, without any local internal symptom, till six weeks before his death, when he began to complain of pain in the forehead, and considerable uneasiness in the abdomen. His pulse was natural, but his appetite was bad, his tongue foul, and his sleep disturbed. After the usual treatment, the pain in the belly was removed, and the headach was much relieved, so that for a fortnight he made little complaint. The headach then returned with much severity, and, without any other change in the symptoms, he became gradually comatose, and died after three days of profound coma.

Inspection.—There was much effusion in the ventricles of the brain, and considerable ramollissement of the cerebral substance in several places. A large firm tumor adhered by its base to the middle of the falx on the right side. It was nearly five inches in circumference at the broadest part, and about an inch and a half in thickness. Internally, it was of a yellowish-white or ash colour, and of a consistence resembling that of coagulated albumen. It was imbedded in the substance of the right hemisphere, where it had formed a depression for itself, but without any adhesion to the arachnoid of the part. There were two smaller tumors the size of large nuts, and of the same appearance, also attached to the falx,—the one at its posterior, and the other at its anterior extremity, both on the right side. Another tumor of the same kind was imbedded in the anterior lobe of the left hemisphere, and was attached by a slender filament to the pia mater.

There is reason to believe that the deposition of tubercular matter in the brain, as in other parts of the body, is often the result of inflammatory action of a low scrofulous character; that it may at first be excited

by injuries or other causes of inflammation; and that it may then advance gradually in a slow insidious manner.

Case LXXXVIII.—A boy, aged 8, in June 1821, fell from a height, and received an injury on the head, which was followed by considerable stupor. He was relieved for a time, by the usual remedies; and though he was never altogether well, no remarkable symptom occurred till the middle of October, when he complained of a sense of weight in the head, followed by some stupor, with slight paralysis of the right arm and leg. He continued in this state without any farther change, till the 2d March, 1822, when he was seized with severe headach, fever, restlessness, and dilated pupil. After partial relief, by the usual remedies, he sunk gradually into coma, and died on the 17th.

Inspection.—The ventricles of the brain contained about eight ounces of fluid. In the lower part of the posterior lobe of the right hemisphere, there was a firm tumor, the size of an almond. The right lobe of the cerebellum was reduced to nearly a purulent consistence. Below it, and immediately behind the petrous portion of the temporal bone, there was a tumor, the size of a hen's egg, externally of a firm consistence, but internally approaching to suppuration. It adhered firmly to the dura mater, which was much thickened at the place of the adhesion.

Case LXXXIX.—A boy, aged 7, (for whose case I am indebted to the late Dr. Gregory,) in the beginning of the year 1811, received a severe injury of the forehead and nose by a fall, his nose being nearly flattened by it. From this time, he complained of headach, and after two or three months, became near-sighted. Soon after, his sight became indistinct, and after four or five months more, this was followed by blindness. About this time he began to be epileptic, and to be affected with weakness of the lower extremities, which gradually encreased to perfect paraplegia. He died in April,

1812, after coma of three days, his intellect having continued entire till that time.

Inspection.—A firm white flat tumor, the size of a large bean, lay over the junction of the optic nerves. The ventricles contained twelve ounces of clear fluid. The left lobe of the cerebellum was much indurated; and the right lobe was reduced to a mass of unhealthy scrofulous suppuration.

Nearly analogous to tubercular disease in the brain, appear to be those cases in which albuminous matter in a pure state is deposited in cysts in various parts of the brain, or under the membranes. The symptoms connected with some of these are very remarkable.

Case XC.—A woman, aged about 50, had been ill for a year or more before her death, during the greater part of which time she had been confined to bed, or able to be out of it only a part of the day. She was affected with violent paroxysms of headach, which usually attacked her in the night, or about four o'clock in the morning, and generally continued for two or three hours, when it subsided, and left her tolerably easy till the same time the following night. Sometimes the attack was of shorter duration, going off in a quarter or half an hour. During the paroxysm the pain was most intense, and was sometimes accompanied or succeeded by delirium, and sometimes by coma of short duration; on several occasions squinting was observed. Her death was rather sudden; she went to bed at night in her ordinary health, and was seized with her usual paroxysm, which went off about the common time; but it returned a second and a third time, and she died early in the forenoon.

Inspection.—There was considerable effusion in the ventricles of the brain, without any disease of the substance. Between the lobes of the cerebellum, at the upper part, there was a firm white cyst containing upwards of an ounce of transparent albuminous matter of

a pretty firm consistence, and in the lower part of the cyst there was some coagulated blood mixed with it.

Case XCI.—A man, aged 50, had been for some time affected with cough and bloody expectoration. In June, 1818, he was seized with headach, and some confusion of thought, which appeared chiefly in a tendency to misapply words. The pain, which was referred chiefly to the forehead, increased in severity, and attacked him in violent paroxysms. The sight of his right eye was impaired, and soon after lost; and his speech became indistinct, and after some time inarticulate. Six weeks after the commencement of these complaints, all the symptoms were increased. Violent paroxysms of pain were excited by the least motion, and even by change of posture in bed. He seldom attempted to speak, but he often pressed his hand on his forehead, and seemed to have uneasiness in his right arm. He had some squinting, with general weakness and paleness, and his intellect was evidently impaired. He died in August in a state of coma. The pulse had been usually natural, sometimes slow.

Inspection.—In the substance of the left hemisphere of the brain, towards the posterior part, there was a soft and vascular cyst, containing about two ounces of a thick colourless albuminous fluid, coagulable by heat, and exactly resembling the albumen of an egg. The cerebral substance around the cyst was softened; the brain in other respects was healthy. The ventricles contained a small quantity of serous fluid, and had no communication with the cyst.

Case XCII.—A child, aged at the time of his death $3\frac{1}{2}$ years, died in May 1823, after having been for nearly three years affected with almost constant convulsion. The disease began at the age of eight months, and at first assumed the form of a singular convulsive starting of the left arm and leg, compared by an intelligent surgeon who saw him at the time, to the motion which is produced by the electric shock. By degrees this passed

into more regular convulsion, which afterwards affected the whole body. It occurred generally five or six times every day; occasionally there were intervals of a day or two, and at one time of two weeks; but, after such intervals, the disease generally recurred with double severity. For a year or more before death, the child had been in a state of general palsy, except an occasional motion of the left hand. He was in a state of perfect idiotism, and never attempted to speak; he swallowed food when it was put into his mouth; and occasionally expressed his wants by peculiar cries, which his mother came to understand. Notwithstanding the complete want of voluntary power, the convulsive movements continued with great severity, and all the long bones of the extremities were twisted by them in a most singular manner.

Inspection.—The bones were all very soft, and the long bones of the extremities singularly twisted; the head was of a natural size, and the anterior fontanelle was open. The left hemisphere of the brain, over rather more than its anterior half, was remarkably depressed by a mass of pellucid albuminous matter, which was lodged under the arachnoid; it resembled in appearance the albumen of an egg, but was much firmer, so that pieces of it could be separated from the mass and lifted up. Parts of the mass being thrown into boiling water became immediately opaque and coagulated. The brain in other respects was healthy.

In these cases the fluid contained in the cysts was of an albuminous character. But it may also be found serous even in cases of very long standing. A very remarkable case is mentioned by Andral. The patient was affected, at the age of 8 years, with palsy of the left side, which continued till puberty, and then gradually disappeared, leaving the limbs which had been affected, however, weaker than those of the other side, and much smaller in size. He lived in this state to the age of 72, and then died exhausted, without any symptoms in the head, or palsy. About the middle of the

right hemisphere, there was found a cyst, formed in the sub-arachnoid cellular texture, full of a serous fluid, and the size of a small apple,—(" pomme d'api.")

I conclude this part of the subject with the following remarkable case, showing the most extensive destruction of the substance of the brain that has ever occurred to me. It seems to have been originally a tubercular mass mixed with some masses of an albuminous character, and at last terminating by most extensive ramollissement. When we consider the extent of the disease, and the state of health of the patient a few hours before death, it is probably almost unique in the history of diseases of the brain, and shows us in a very striking manner the imperfection of our knowledge in regard to the symptoms arising from cerebral disease.

Case XCIII.—A young lady who, between her 14th and 17th years, had suffered considerably from chronic ophthalmia, was attacked in her 18th year with paralysis of the face. The mouth was twisted to the right side; the orbicularis of the left eye was affected, so that the eye could not be shut without a great effort; the sight of that eye was much impaired, and there was numbness of the whole left side of the face; the pulse was natural. The affection had begun with pain referred to the left ear. She was bled generally and topically, and freely purged, and the affection disappeared in six or eight days. Some time after, she had a second attack of the same kind, which also subsided in the same manner. After this she became liable to attacks of giddiness, accompanied by indistinct vision, and followed by vomiting. These attacks were of frequent occurrence, but did not in general continue above a day or two, and in the intervals she was in perfect health. These symptoms went on for about a year. In her 19th year, while she was one day sitting at dinner, she suddenly fell from her chair in a state of complete insensibility, with general muscular contraction or rather rigidity, but without convulsion; and in this state she re-

mained for nearly two hours. This occurred in the month of June 1822, and there was no recurrence of the attack till December following, when she had one exactly similar. A third took place in February 1823; and a fourth in June of the same year. From the first occurrence of these paroxysms, the attacks of giddiness became more distressing, and were then for the first time accompanied by headach, which was chiefly referred to the left temple and the left ear; and the attacks were often followed by thin watery discharges from the ear. After the fourth paroxysm of the comatose affection, she began to have indistinctness of vision. At this period she used sea-bathing, by which the headach was increased, and the indistinctness of vision passed into a considerable degree of amaurosis. For the latter affection, an emetic was now recommended to her, the operation of which was immediately followed by a violent attack of the paroxysm of insensibility, and these continued to recur at short intervals to the time of her death. In regard to the period of their occurrence, the account of her friends was, that for a fortnight they attacked her generally every day, and for the next fortnight she was entirely free from them. They continued to exhibit nearly the same characters as formerly described, namely, insensibility, with muscular rigidity; and there never was any appearance of convulsion, except in one instance, during the whole course of the disease. The attack generally continued from half an hour to an hour; and, except the imperfection of vision, her general health was so good, that she was married in February 1824, which was about two months before her death. At this time she first came under the care of my friend, Dr. Ross, to whom I am indebted for the preceding history; and the leading symptoms then were, frequent recurrence of the paroxysms of insensibility, with violent headach, accompanied by giddiness and sickness. There was a great degree of amaurosis, but the pulse was natural, and her health in other respects good. Under the use of extract of stramonium, the paroxysms were now suspend-

ed, the vision was very much improved, and her general health and spirits were such, that the evening before her death was spent cheerfully with a party in the house of a friend. She returned home about eleven o'clock at night, and went to bed apparently in her usual health. About eight o'clock in the following morning, she was found in a state of insensibility with rigidity of the body; she was supposed by her friends to be in one of her usual attacks, but when she was seen by Dr. Ross, a short time after, he found that she was dead. I was present at the examination of the body.

Inspection.—The brain externally appeared healthy, but when a thin section was cut from the upper part of the left hemisphere, a cavity was exposed, through which a probe passed in every direction without any resistance, through nearly the whole extent of the hemisphere. This, upon farther examination, was found to arise from the whole hemisphere being in such a remarkable state of decomposition or softening, that it formed one great cyst, full of soft pultaceous matter, inclosed in a very thin covering, formed by the healthy cerebral matter on the surface. The healthy portion forming this covering, in many places did not exceed a quarter of an inch in thickness; and at the thickest parts, which were on the upper surface of the brain, did not exceed one-half or three-fourths of an inch. The contained matter was a thin soft pulp, mixed with portions of a pellucid albuminous substance, which coagulated when thrown into boiling water. This matter was chiefly in irregular masses, but there were some firmer portions of it which could be separated in the form of distinct round nodules, resembling hydatids. On examination, however, they were found not to be hydatids, but uniform masses of the albuminous matter in a more concrete state. On the external part of the hemisphere, lying over the petrous portion of the temporal bone, there was a tumor the size of a pigeon's egg, adhering firmly to the inner surface of the dura mater. Externally, it was irregular as if formed of a

congeries of smaller tumors; internally, it was composed partly of a reddish soft flesh coloured matter, and partly of a semipellucid albuminous substance, in nodules of various degrees of firmness. When thrown into boiling water, the whole mass assumed a uniform opaque white colour, and a hard cheesy consistence. The left ventricle was entire; it contained a small quantity of serous fluid, and was separated from the diseased mass by a very thin septum. The right hemisphere was healthy, except on the inner part of the anterior lobe, which was considerably softened. It appeared to every one who witnessed the dissection, that the left hemisphere had been considerably enlarged, and the right diminished in the same proportion, the falx being sensibly pressed towards the right side. The optic nerves seemed softer than natural; the cerebellum was healthy.

SECTION II.

OF CERTAIN AFFECTIONS OF THE BONES OF THE CRANIUM.

I was led to make some researches on this subject by the following Case,—

Case XCIV.—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 had a very disordered state of the stomach and bowels. She was able, however, to attend to the ordinary duties of her family, till about three weeks before her death, when she was seized with fever and outrageous delirium. These symptoms subsided after

a bleeding; and next day, she had 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 discharge of matter from the right ear. She continued in this state, sitting up part of every day, till three days before her death, when she became comatose, with partial paralysis of the left side, and frequent convulsive motions of the right arm. She died on the third day after the occurrence of these symptoms.

Inspection.—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 inner table seemed to be wanting through its whole extent, and there appeared the rough, irregular, and cancellated structure of the central part of the bone. Betwixt this surface and the dura mater, there was a deposition of soft adventitious membrane of a yellowish colour, varying from one-twelfth to one-eighth of an inch in thickness. In raising the skullcap, this membrane, in some places, adhered to the dura mater, leaving exposed the irregular cancellated structure of the bone; and in other places, it adhered to the bone, exposing the dura mater of its natural appearance. The parts affected by this singular state of disease were, the frontal bone above the orbitar plates, the whole of both parietal bones, the squamous portion of both temporal bones, and rather more than the upper half of the occipital bone. The greatest erosion was on the parietal bones, where several portions were very thin and transparent, and a few points were perforated. The external surface of the cranium was of a natural appearance, except at a few points where the erosion had perforated the bone by very small apertures. 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 healthy.

I find no case described by any writer exactly resembling this remarkable affection of the bone. There was a complete destruction of nearly the whole inner table of the cranium; and in its place, a deposition of a soft adventitious membrane, by which the dura mater was everywhere agglutinated to the diseased bony surface. This disease must have been going on for a considerable time; the abscess of the brain was probably recent, and the immediate cause of death. The patient was a respectable married woman, and there seemed no ground for suspecting a syphilitic taint. Such a disease therefore is probably to be considered as the result of a slow inflammatory action affecting the bone, and gradually destroying it by caries. Such a disease may originate in an injury, or may commence without any obvious cause. It affects most commonly the external table of the skull, though it may likewise affect the internal; but I have seen no case described by any writer in which it was entirely confined to the internal table. A lady mentioned by Mr. Howship,* at the age of 15, received a slight blow on the right side of the head, and for 30 years after, was liable to severe headach, which was constantly referred to that spot. She then became drowsy, and her vision was impaired, and at the age of 50 she died comatose. At the seat of the original injury, the bone, to the extent of a crown piece, was so thin from absorption as to be almost transparent. The dura mater at this part was altogether removed, and the brain beneath was of a dark livid colour, and much indurated; and this disease extended through the whole middle lobe. In a case mentioned by Desault, death followed a blow on the head after a month; the bone was externally sound, and its coverings were healthy; but the internal table was blackened through the whole extent of one of the parietal bones; the dura mater adhered to the bone as firmly as to the other parts of the

* Practical Observations in Surgery and Morbid Anatomy.

cranium; and there was suppuration on the surface of the brain. This was probably an earlier stage of that disease which occurred in Case XCIV, and in a more limited form in Mr. Howship's case.

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 tumor 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 and without pain, and about this time he suffered some convulsive attacks. Caustic was applied to the posterior part of the tumor, and when the eschar separated, the integuments were found to be two inches in thickness; and the bone beneath was extremely irregular, sending up sharp bony spiculæ into the tumor, some of which were an inch in length. A similar eschar being taken out from the anterior part showed the same appearances. Much thin ichorous matter was discharged from the openings with 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 tumors, and corresponding to these there were two small abscesses in the brain. The inner surface of the 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 extensive

* Medical Observations and Enquiries, vol. v.

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; and 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 other table being sound. A man mentioned by Dr. Clossy became epileptic after a blow on the head, and the fits returned several times a day for three years. A fulness was perceived at the seat of the injury, which, being exposed by an incision, was found to be an elevation of the bone, namely, a part of the left parietal. At this place the trephine was applied, and the bone on perforating it was found "cellulous and spungy, with pus in the midst." The man died comatose a few days after the operation, and on inspection, there was found a circular asperity on the inner surface of the bone about the size of a crown piece, with several small abscesses in the membrane the size of peas.*

The cases now referred to may be considered as examples of an uncommon modification of the disease of the bones of the head, in which it is principally confined to the inner table. The more common modification of it is that which occurs in the outer table, or which affects the whole depth of the bone; and some remarkable phenomena are connected with the history of the disease. It appears to be the result of a peculiar low inflammatory action, which may arise from injuries often very slight; or may commence without any obvious cause. Its progress is often extremely slow; but when it has been excited, it is impossible to conjecture how far it may extend. It may terminate by exfoliation of a part of the outer table, or may affect the whole depth of the bone; and it may extend to the dura mater and brain, and then be speedily fatal. A man mentioned by Mr. O'Halloran, was seized, without any

* Clossy's Observations on some of the Diseases of the Human Body, p. 17.

injury, with a pain in the upper part of the os frontis, which increased in violence with throbbing, so as to unfit him for his employment. After nearly four months, an abscess was formed on the part, which burst; the bone was found carious, and perforated by an opening, through which the dura mater could be seen covered with pus, and by this opening matter was discharged at each dressing to the amount of a table spoonful. The piece of bone became loose, and separated in ten days; another piece, which was also carious, was separated in another week, and in a fortnight from this time the wound was healed.* This may be considered as an example of the idiopathic form of the disease. The inflammatory action probably began in the pericranium, and afterwards affected the bone. The disease arises more commonly from injuries, and is often remarkably slow in its progress. A man, mentioned by the writer now referred to, received a blow on the head with a cudgel, which left some heaviness and headach, but without any urgent symptom, until many months after, when a tumor formed on the part, and attained the size of an apple. It was opened, and under it there was found a circular aperture in the cranium the size of a half-crown, exposing the dura mater, which was covered with pus. After some time, a fungus arose from it; and after this had been destroyed by alum, the sore healed. A boy, aged 7, mentioned by Sir T. Cullum, fell with his head in the fire, it was supposed from a fit, and was much burned before he was observed. The consequence was an extensive eschar, which did not separate for a very long time. It then left the bone quite bare, and after three months more a separation of bone took place in one piece, consisting of the whole of one parietal bone, part of the other parietal, and part of the occipital. Granulations springing from the dura mater then presented themselves, and in six months the sore was healed, except a part about the size of the mouth of a small tea-cup; the boy being

* O'Halloran on Injuries of the Head, p. 58.

otherwise in perfect health. Between five and six years after, there was still a sore the size of a crown piece, which discharged considerably; and at that time, "very little ossification had been produced towards the reparation of the injury."

A remarkable circumstance in the history of disease of the bone is, that when it has once been excited, it is not always confined to the part which was the seat of the injury, but may spread gradually and extensively over other parts of the cranium. 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; and, on that place, a tumor formed, which was opened more than three months after the fall, when the bone was found carious. The trephine was then applied, under the belief that matter might be lodged within, but none was found; the disease was confined to the bone, the dura mater being healthy. A similar tumor soon after formed on the occiput, under which also the bone was found carious; after some time it exfoliated, a piece being thrown off the size of a sixpence, and the wound healed. In this manner tumor after tumor 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 bone 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 the 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 one-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 woman mentioned by Saviard, who was

* Transactions of the Medical Society of London, vol. i.

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 skullcap 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 integuments. Hildanus relates the case of a man, on whose cranium a number of tumors formed, from which pieces of bones 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 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.

Another peculiarity in the history of these affections is the slowness with which the bone falls into disease, and the length of time during which a disease, of small extent, may exist, producing urgent symptoms, but making very little 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, when 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 it is likely that simply exposing the bone, and promoting its exfoliation, might have answered as well as this formidable operation. In other cases of this kind, the disease is at first confined to the inner table, from which it may, after a long interval, extend inwards, terminating by fatal disease in the brain: some examples of this have already been referred to. In other cases, again, it appears that the disease may be first external, and afterwards, leaving its original seat, 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 became epileptic. The trephine was applied at 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.

Many surgical writers teach us that in cases in which the bone becomes diseased after wounds and 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 numerous cases in which the pericranium was separated without any such consequence; and others, in which the bone became carious, though the pericranium had not been separated. In a case already quoted from Desault, in which death followed a blow on the head after a month, the bone was externally sound and its covering 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. 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. On this principle it appears, that there is in general very little encouragement for meddling with such cases by the trephine. If symptoms indicate the formation of matter beneath the bone, this must be evacuated; but perforations will remove only the danger from the lodgment of matter, and their other effects on parts thus liable to inflammatory action are extremely ambiguous. It is certain, that many cases of this kind have proved fatal soon after the application of the trephine, which had been going on for a considerable time without exhibiting any unfavourable

symptom. In a remarkable case which has been reported to me by an intelligent friend, and which had this termination, the inner table of the skull was found on inspection to be perfectly sound. The disease was confined to the external table, which was found to a considerable extent completely separated from the internal, being confined only by the integuments. The case had originated in a slight wound which had fallen into an ill-conditioned state, and the caries had been going on for a considerable time. Free incision of the integuments is the only practice that can be required in such a case, and then promoting the separation of the diseased portion of bone by the usual means.

Even in the ordinary cases, so familiar to practical surgeons, in which the formation of matter takes place within the cranium in consequence of external injuries, it is probable that the main object of attention ought to be the inflammatory action which has been excited, rather than the mere changes which are going on in the bone; and that the formation of matter is to be considered not as an effect of the disease of the bone, but as a result of the inflammation of parts from which the bone itself has also suffered. Cases are related by Morgagni and others, in which, after such injuries, matter was formed between the cranium and the brain, without the least appearance of disease in the bone. The communication of inflammatory action from the bone itself to the brain and its membranes, is strikingly illustrated by two cases related by De Haen, in his remarks on the application of the actual cautery to the cranium. This remedy seems to have been at that time very much employed in various affections of the head; and it was performed by first turning back a portion of the integuments, and then applying the cauterizing iron to the surface of the bone. In the two cases referred to, namely, a boy of 12, and a young woman of 20, this practice was employed on account of amaurosis. They both died with symptoms of cerebral inflammation; the former on the fourth day, and the latter on the fifth after the operation. On dissection, extensive inflammation

of the membranes was found, with formation of matter; and in one of the cases, the disease had affected the substance of the brain. The cases are interesting, as showing the direct communication of inflammatory action from the bone to the parts beneath, without contusion or any injury which could directly produce the death of the bone, for no caries or destruction of the bone itself was observed in either case.

In the affections of the bone, which have been the subject of the preceding observations, the piece of bone, which was the seat of the disease, is in general eroded by caries through its whole extent; but a very remarkable variety of the affection has been described by Professor Russel, in which the ulcerative or carious process advances in a narrow line in a circuitous manner, so as to insulate a piece of bone of some extent, which is afterwards thrown out. The part thus separated is in some cases perfectly healthy, and in others is more dense than in the healthy state, being smooth and white like a piece of ivory, and without diploe. In some of these cases, the disease took place after injuries, and in others without any apparent cause.*

Another singular variety of the affection 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 nine months, mentioned by Mr. Howship, received an injury of the right parietal bone from a fall. There was no wound, and no urgent symptom at the time; but several weeks after the accident, the pulsation of the brain was distinctly perceived at the seat of the injury, and the child became paralytic on 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 she was otherwise in good health; but there was still a considerable deficiency of bone on the right side of the head, and when she cried or coughed, this part became tense

* Transactions of the Medico-Chirurgical Society of Edinburgh, vol. i.

and evidently swelled. A boy, aged 14, mentioned by Mr. Wilmar, received a blow on the head, which was immediately followed by a soft tumor about two inches in diameter at the base. After this tumor had continued stationary for two months, it was opened by a free incision, but discharged only blood in a fluid state. Under it the bone was found to be completely wanting to an extent exactly corresponding to the base of the tumor. The wound healed favourably.*

Many cases have occurred in which tumors of the dura mater have occasioned absorption of a portion of the bone, and have appeared under the integuments. A remarkable case of this kind, which I saw along with Mr. Wishart, has been described by him in the Edinburgh Medical and Surgical Journal, (vol. xviii. p. 393.) Many others are on record, some of which present interesting phenomena from complications of disease. A girl, aged 19, mentioned by Mr. Hill, was first seized with numbness of the left hand, which gradually extended upwards along the arm, and was accompanied by vomiting and violent headach. After two months, the whole left side became paralytic. After another month, a small tumor like a pea appeared by the side of the bregma, which being repeatedly opened with a lancet, discharged matter with some relief. After seven months more, Mr. Hill found a small opening in the left parietal bone about a quarter of an inch in diameter, but which was plugged up by a hard substance from within. The trephine being applied at this place, discovered an abscess, which discharged four ounces of matter, and a small excrescence like a wart, which had completely plugged up the opening in the bone, and had prevented the escape of the matter. There was much relief after the discharge, but protrusion of the brain took place, and she sunk gradually and died in about two months, retaining her faculties till the last two days. Much effusion was found in the ventricles of the brain, and destruction of the brain by suppuration about two inches

* Wilmar's Cases on Surgery.

around the opening of the skull.* It seems probable that in this singular case, the small warty excrescence on the dura mater had produced absorption of the bone, and thus afforded a partial exit to the matter. But many instances are on record, in which, without any cause of this kind, matter formed within the cranium has found for itself an exit through the bone; some examples of this have been already referred to; I shall only add another. A man mentioned by Dr. M'Turk, in the Medical and Physical Journal for April 1819, was affected with great derangement of the stomach and pain in the back of his head, which was much increased by motion. His sight and hearing were impaired, especially during the more severe paroxysms of pain, when his sight was nearly lost. He had continued in this state nearly a year, when a tumor formed on the sagittal suture, which being opened, discharged matter freely; and, on examining the wound, it appeared that there was an opening in the suture, and that the matter came from within the cranium. The wound healed gradually in a few weeks, and from that time he was free from complaint.

SECT. III.

OF CERTAIN AFFECTIONS OF THE PERICRANIUM.

Some obscure affections of the head, 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

* Hill's Cases in Surgery, p. 130.

† Transactions of a Society for the Improvement of Medical and Surgical Knowledge, vol. iii.

symptoms in general were headach, with various uneasy feelings in the head, and 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 diluted nitric 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.

This affection seems to correspond with the disease which has been described by Mr. Crampton under the name of Periostitis.* Among his cases, affecting various parts of the body, there are two remarkable exam-

* Dublin Hospital Reports, vol. i.

ples 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 tumor on the right side of the nose, from which, after some days, a swelling extended along the right eyelids and forehead, with considerable erysipelatous inflammation and fever. On the ninth 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 external disease, 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 correspondiug to the principal disease of the pericranium. The other case is that of a woman, aged 32, who was affected with a tumor the size of 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 tumor, 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 wasted and paralytic, and the fingers were contracted ; both lower extremities were feeble ; her speech was indistinct ; she had vomiting, and frequent epileptic fits. The tumor was divided freely down to the bone, and in doing so the pericranium was found thickened, firm, fibrous, and morbidly sensible. It formed the principal part of the tumor. The bone under the tumor 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 recovered the use of her arm, and was free from complaint.

Tissot* seems to have met with this disease, and to have 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 affections, 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 8 years. A painful feeling continued in the scalp at the place of the injury, and for 10 years he was liable to intense headach, 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 slightly red and a little swelled; the hair upon it was coarse, and stood out like bristles, and pressure upon the spot produced intense pain. The pain extended to the right eye, the vision of which was obscur-

* Tissot Epist. Med. Var.

ed 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: but 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 more 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.

The following is the best example that has occurred to me of this remarkable affection.

Case XCV.—A servant girl, aged about 20, fell backwards with a child in her arms, and received the full force of the fall upon the most prominent part of the occipital bone. She soon recovered from the immediate effects of the injury, but continued to have pain in the part; and after several months, was seized with paraplegia and retention of urine. She was now confined to bed for three or four months, after which she recovered the use of her limbs in a tolerable degree, but the retention of urine continued, and she came to Edinburgh in the beginning of 1828, which was more than a year after the accident. The paraplegia was now nearly removed, but she had still retention of urine, requiring the constant use of the catheter. On the seat of the injury on the occipital bone, a round portion, the size of a crown piece was acutely tender, and very mo-

derate pressure upon it produced complete insensibility, which continued a minute or two, and returned as often as the pressure was repeated. It had the appearance of syncope, but the pulse was not affected. In this state I saw her along with Mr. Lizars, and it was agreed to make a free crucial incision through the part, and to keep the wound open by dressings so as to promote suppuration. In doing so, the pericranium was found tender and somewhat thickened, but the bone was sound. On the following day she passed her urine freely, and she continued free from complaint as long as the wound continued to discharge. It healed at the end of a fortnight, and the retention of urine returned immediately. The incision was now repeated with the same result as before, her urine being freely passed almost immediately. Various means were then employed to promote a more complete suppuration from the wound, but it healed after two or three weeks, and the retention of urine returned as before, with considerable tenderness in the affected spot. A third incision was then made with the same effect as before, and various applications were made with the view of promoting exfoliation of bone, as in Sir Edward Home's cases, but without success, and the wound again healed after three or four weeks. The fits of insensibility on pressure now returned, which had not returned after the former incisions, and along with them the retention of urine.

After that time repeated incisions were made with similar results. The principal change in her situation then was, that she got free of the fits of insensibility upon the spot being pressed; and the effect of the incisions continued longer, as on several occasions she remained free from the retention of urine for several weeks after the incisions were healed, and at one time enjoyed good health for three months. She was thus gradually restored to perfect health.

Since the publication of the former edition of this volume, I have seen several cases of this very interesting affection, presenting characters similar to those

which I have mentioned in the general description of it, and yielding to a free incision of the part, after the symptoms had been of long continuance, and had resisted much active treatment. One of them, in which the symptoms were very severe, and of eighteen months standing, has been described by Mr. Blacklock in the Edinburgh Medical Journal for July 1831. In another of the patients, a clergyman, the affection seemed to have been produced by a small piece of plaster which fell on his head from the ceiling of a church. The injury at the time was of the most trifling description, but this affection gradually supervened, accompanied by a train of anomalous nervous symptoms, which greatly impaired his general health, and rendered him entirely unable for his duty for many months. He was quite cured by the incision, which had to be repeated twice.

In these cases, the seat of the disease was distinctly indicated by the tenderness on pressure of a defined spot of the pericranium. But the following case presents some features of great interest, from the complete relief which was afforded by the same operation, though there had been no tenderness at the part, and nothing that led distinctly to the belief that disease of the membrane existed. It has led me to suppose that there are cases of untractable affections of the head in which this treatment might be beneficial, though not distinguished by the symptoms indicating the disease which has led to these observations.

Case XCVI.—A man, aged 39, upwards of eight years ago, received an injury on his head from the wheel of a waggon. It produced a sore which healed in about ten days. About eight months after this he began to be affected with attacks of headach, which had continued to recur from that time, though sometimes at long intervals. When I saw him, along with Mr. Kennedy, in autumn 1833, he had been suffering from intense pain in the head for two months. During the whole of this time he had been confined to bed, and unable for any kind of exertion; every kind of active

treatment had been employed without any relief; and the case now exhibited every character of a fixed and formidable disease of the brain. As the principal seat of the pain, he referred to a spot on the vertex, and from this the acute pain seemed to dart into the centre of the brain, and particularly towards the left ear. The spot to which he pointed on the vertex, corresponded with that which he represented as the seat of the original wound; but no cicatrix could be discovered, and there was no tenderness of the integuments, nor any other appearance of superficial disease. All the usual remedies, however, having been employed without benefit, I suggested a crucial incision at this part, which was done with complete relief. The wound healed in nine days; he soon after returned to his usual employment as a baker, and, through the winter, enjoyed good health. During the present summer, (1834,) he has had a return of headach, after exposure to great heat. After it had resisted various remedies, a repetition of the incision was contemplated, but, at present, the affection seems to be subsiding.

PART II.

OF THE APOPLECTIC AFFECTIONS.

The remarkable condition which we call coma, or oppression of the brain, appears from the preceding observations to be connected with various and very different conditions of that organ. We have seen it existing with extensive effusion, and without any effusion; and we have seen extensive effusion and extensive destruction of the cerebral substance taking place without producing it. We have seen the same want of uniformity in regard to the various other morbid conditions which have been the subjects of the preceding observations; and, upon the whole, if we are asked, what is that condition of the brain which produces coma, I think our answer must be, that we cannot tell. We are not, however, to sit down contented with this profession of our ignorance, but ought, on the contrary, to consider this conclusion as a position of much importance, from which we are to commence a new course of investigation. In this course, putting away from us the theories which have been so often received as established principles, we must restrict our inquiries to a patient investigation of the phenomena of disease.

In the investigation of the cases which are more properly referable to the head of apoplexy, we find the same difficulties which have met us in the inflammatory affections. A person previously in perfect health

falls down suddenly, deprived of sense and motion, and dies, after lying for some time in a state of coma. We find on examination a large coagulum of blood compressing the surface of the brain, or filling its ventricles, and the phenomena of the disease appear to be distinctly accounted for. Another person is cut off with the same symptoms, and we expect to find the same appearances, but nothing is met with except serous effusion, in no great quantity, in the ventricles, or only on the surface of the brain. A third is seized in the same manner, and dies, after lying for a considerable time in a state of coma, from which nothing can rouse him for an instant; and on the most careful examination, we cannot detect in his brain the smallest deviation from the healthy structure.

These facts have not escaped the observation of pathologists at various periods, and much difficulty was experienced in accounting for them upon the old doctrine of compression of the brain. Hence arose many speculations in regard to those cases in which no morbid appearance was met with on dissection, or none that was considered adequate to account for the disease.

In a remarkable case of this kind, which occurred to Willis,* he supposes that the animal spirits were suddenly extinguished or suffocated by certain malignant or narcotic particles. Seelmatter ascribes the affection to a sudden relaxation of the nerves; Nicolai to a spasm of the meninges; and Lecat and Weikard to a spasm of the nerves and vessels of the brain. Kortum endeavours to reconcile the discordant opinions of his predecessors, by referring all these cases to a new species of apoplectic affections, which he styles Apoplexia Nervosa. Upon the same principle, other modifications of apoplexy have been contended for, which have been supposed to include these obscure and inexplicable cases, as the Apoplexia Convulsiva, and Apoplexia Hysterica of Burserius, Tissot, and other writers. Tissot mentions a woman, who, after complaining for some time of head-

* Willis De Anima Brutorum, part 2. p. 276.

ach, was attacked with a great and sudden increase of pain, accompanied by loss of sleep, and died in a short time. On dissection no morbid appearance could be detected. A young woman, mentioned by the same writer, having, during the flow of the menses, suffered from a fright, the discharge stopped, and she became liable to frequent leipothymia. After suffering from this and various other symptoms for several months, she fell into a profound sleep, from which nothing could rouse her; this continued four days; she then came out of it and appeared to be recovering, when, after several days, she was seized with severe headach, anxiety, and convulsions, and died. No morbid appearance could be detected in any of the viscera. Lecat attaches much importance to a case which occurred to him, in which, after fatal apoplexy, he found no morbid appearance except a small quantity of extravasated blood, not exceeding a tea-spoonful. This, he contends, could not account for the disease upon the principle of pressure, but was to be considered as an effect, rather than a cause, of that spasm of the vessels, which he conceived to be the proximate cause of apoplexy. This explanation did not satisfy his contemporaries, and various doctrines were brought forward to account for this form of the disease. Some maintained that the medullary substance of the brain is much more susceptible of compression than the cineritious; but the prevailing opinion was, that there are certain parts of the brain, where, by retarding the course of the animal spirits, slight causes of compression are capable of producing the most urgent symptoms. Hence arose a new and extensive controversy respecting the origin and progress of these animal spirits, and the course by which they make their exit from the brain. This important function was by one assigned to the aqueduct of Silvius; by another, to the fourth ventricle; by a third, to the infundibulum; by a fourth, to the choroid plexus and straight sinus; and fatal apoplexy was supposed to be produced by very slight causes, existing at these particular parts, and even by causes so minute as altogether to elude observation.

From the number and variety of these speculations, we perceive the difficulties which attend the pathology of apoplexy, and learn the important fact, that apoplexy has, by extensive observation, been ascertained to be fatal without any morbid appearance, or with appearances so slight as to be altogether inadequate to account for the disease.

The most simple illustration of the apoplectic state, is derived from those cases in which it is distinctly traced to an external cause, and ceases when that cause is removed. A boy mentioned by Zitzilius, had drawn his neckcloth remarkably tight, and was whipping his top, stooping and rising alternately, when, after a short time, he fell down apoplectic. The neckloth being unloosed, and blood being drawn from the jugular vein, he speedily recovered. Strangulation, when the neck is not dislocated, appears to be simply apoplexy. A man brought after execution to Sauvages was recovered by three bleedings, and sat up and talked, his breathing and deglutition being natural. After a short time the part of his neck where the cord had been applied began to swell, so as evidently to impede the circulation in the veins of the neck: he then became drowsy, his pulse and respiration slow, without dyspnœa, and in a few hours he died apoplectic. A woman mentioned by Wepfer recovered after execution under the same treatment. After her recovery she was for some time affected with vertigo, which subsided gradually. To cases such as these, we may add the numerous examples, in which persons fall down suddenly in a state of perfect apoplexy, and very speedily recover under the appropriate treatment, without retaining any trace of so formidable a malady.

The apoplectic attack, as it occurs in such examples as these, must be supposed to depend upon a cause which acts simply upon the circulating system of the brain, producing there a derangement which takes place speedily, and is often almost as speedily removed. What the precise nature of that derangement may be, is a point of the utmost difficulty to determine, and per-

haps we have not data upon which it can be determined by legitimate induction. The subject leads to speculations of a very interesting kind, but it must be confessed that they are in themselves in a great measure hypothetical, and that their application to the phenomena of apoplexy is also conjectural in a very great degree. They may be worthy of some attention, but must be kept entirely distinct from our present course of inquiry, in prosecuting which, I shall now take a general view of the principal varieties of symptoms which occur in the attack of apoplexy.

The apoplectic attack is generally preceded by symptoms indicating some derangement of the circulation in the brain. The most remarkable of these are the following:—headach, giddiness, sense of weight and fulness in the head, violent pulsation of the arteries, and confused noises in the ears. These symptoms are often accompanied by epistaxis, which may give a partial and temporary relief; by loss of recollection, and incoherent talking, resembling slight intoxication; by affections of the sight, double vision, and temporary blindness; by drowsiness and lethargic tendency. We also frequently observe indistinct articulation, and other partial paralytic affections. These are sometimes confined to one limb, or part of a limb; sometimes affect the eyelids, producing inability either to shut the eye or to open it; and frequently impair the muscles of the face, producing a slight distortion of the mouth. These symptoms, and others of a similar kind, mark the tendency to the apoplectic state, and often appear for a considerable time before the attack actually takes place. The attack itself occurs chiefly under three distinct forms, which it is of importance to distinguish from each other.

I. In the first form of the attack, the patient falls down suddenly, deprived of sense and motion, and lies like a person in a deep sleep; his face generally flushed, his breathing stertorous, his pulse full, and not frequent, sometimes below the natural standard. In some cases

convulsion occurs, in others rigid contraction of the muscles of the extremities; and sometimes contraction of the muscles of the one side, with relaxation of the other. In this state of profound stupor, the patient may die after various intervals, from a few minutes to several days; or he may recover perfectly, without any bad consequence of the attack remaining; or he may recover from the coma, with paralysis of one side. This paralysis may disappear in a few days, or it may subside gradually, or it may be permanent. Other functions, as the speech, may be affected in the same manner, being speedily or gradually recovered, or permanently lost; and recovery from the apoplectic attack is sometimes accompanied by loss of sight.

II. The second form of the disease begins with a sudden attack of pain in the head; the patient becomes pale, sick, and faint; generally vomits, and frequently, though not always, falls down in a state resembling syncope; the face pale, the body cold, and the pulse very feeble. This is sometimes accompanied by slight convulsion. In other cases, he does not fall down, the sudden attack of pain being only accompanied by slight and transient loss of recollection. In both cases he generally recovers in a few minutes from the first effects of the attack, is quite sensible and able to walk, but continues to complain of headach; after a certain interval, which may vary from a few minutes to several hours, he becomes oppressed, forgetful, and incoherent, and then sinks into coma, from which he never recovers. In some cases paralysis of one side occurs, but in others, and I think the greater proportion of this class, no paralysis is observed.

III. In the third form, the patient is suddenly deprived of the power of one side of the body, and of speech, without stupor; or if the first attack be accompanied by a degree of stupor, this soon disappears; he seems sensible of his situation, and endeavours to express his feelings by signs. In the farther progress of this form of the dis-

ease great variety occurs. In some cases, it passes gradually into apoplexy, perhaps after a few hours ; in others, under the proper treatment, the patient speedily and entirely recovers. In many cases the recovery is gradual, and it is only at the end of several weeks or months that the complaint is removed. In another variety, the patient recovers so far as to be able to speak indistinctly, and to walk, dragging his leg by a painful effort, and after this makes no further improvement. He may continue in this state for years, and be cut off by a fresh attack, or may die of some other disease, without any recurrence of the symptoms in his head. In a fifth variety, the patient neither recovers, nor becomes apoplectic ; he is confined to bed, speechless and paralytic, but in possession of his other faculties, and dies gradually exhausted, without apoplexy, several weeks or months after the attack.

These three forms of disease frequently pass into one another ; but they are very often met with, as they are here described, forming affections which differ remarkably from each other ; and they appear very naturally to arrange themselves into the three classes which have here been referred to :—first, those which are immediately and primarily apoplectic ; secondly, those which begin with a sudden attack of headach, and pass gradually into apoplexy ; thirdly, those which are distinguished by palsy, and loss of speech, without coma.

SECTION I.

OF THE CASES PRIMARILY APOPLECTIC.

The apoplectic attack is a sudden deprivation of sense and motion, the patient falling down as in a profound sleep, the face being generally flushed, and the breathing

stertorous. In tracing the farther history of such an attack, the following circumstances deserve our particular attention.

I. In many cases the patient speedily and perfectly recovers.

II. In many cases the disease is speedily fatal, and we find on inspection extensive extravasation of blood.

III. In other cases which are fatal, generally after a longer interval, we find only serous effusion, often in no great quantity.

IV. In many fatal cases, no morbid appearance whatever can be detected after the most careful examination.

Thus the disease, in a pathological point of view, again resolves itself into three very important divisions; —apoplexy with extravasation of blood;—apoplexy with serous effusion;—and apoplexy without any morbid appearance, or what I propose to call simple apoplexy. The latter affection leads to speculations of very great interest; for the phenomena of the disease appear fully to establish the important fact, that there is a modification of apoplexy depending upon a cause of a temporary nature, without any real injury done to the substance of the brain; that the condition upon which this attack depends may be removed almost as speedily as it was induced; and that it may be fatal without leaving any morbid appearance in the brain.

As one of the terminations of the apoplectic attack, I have mentioned extensive extravasation of blood; but, in point of fact, it will be found that this is not a common termination of those examples which are immediately and primarily apoplectic. The cases which terminate in this manner, in general belong to another class already referred to, and to be afterwards particularly described, which begin with a sudden attack of violent headach, and pass into coma more gradually. The remarks to be offered under this section, therefore, will be confined to the two other forms of the disease, which seem to be nearly allied to each other, namely,

apoplexy without any morbid appearance, and apoplexy with serous effusion.

§ I.—Apoplexy without any morbid appearance, or simple apoplexy.

When a person previously in perfect health falls down suddenly deprived of sense and motion, and dies after lying for a certain time in a state of apoplexy; and when, on the inspection of such a case, we cannot discover in the brain any satisfactory deviation from the healthy structure, this is the affection which I propose to call simple apoplexy. I abstain at present from any speculations in regard to the nature of this remarkable affection, and shall confine myself to a statement of facts calculated to establish its existence as a disease of the brain, which may in this state be fatal.

Case XCVII.—A woman, aged about 30, of a full habit, some years before her death had been affected with symptoms in the head, accompanied by impaired speech, and partial loss of recollection. Some effects of this attack had continued for a considerable time, especially in her speech, but by degrees she had perfectly recovered, and enjoyed excellent health for a long period preceding the attack now to be described. She was stooping over a washing tub, when she was seized with a violent fit of sneezing; she almost immediately became insensible, and would have fallen down had she not been observed and supported by some persons standing by her, who carried her to bed in a state of perfect apoplexy. All the usual remedies were employed in the most active manner without the least effect in alleviating any of the symptoms—she lay with all the symptoms of the most perfect apoplexy, and died on the following day. On inspection no vestige of disease could be discovered in the brain, or in any other organ.

Case XCVIII.—A gentleman, aged 24, had been

observed for some days to be dull and drowsy, and he frequently complained of his head. Not having appeared at his usual time one morning, his friends went into his room, and found him lying across his bed, half dressed, in a state of perfect apoplexy. The attack was evidently recent; and it was supposed that he had been seized while he had stooped over his basin in washing. His face was rather livid, his breathing stertorous, his pulse slow, and of good strength. All the usual remedies were employed with assiduity, but through the day there was no change in the symptoms. In the course of the night he recovered considerably, so as to know those about him; but in a short time after he relapsed into coma, and died early on the following day, little more than twenty-four hours after the attack.

Inspection.—There was a slight turgescence of the vessels on the surface of the brain; no other appearance of disease could be detected after the most careful examination. All the other viscera were in a healthy state.

The following very important case I received from my friend the late Dr. Duncan; it occurred under his care in the Clinical Ward, in May 1829.

Case XCIX.—A man, aged 54, of a plethoric habit and short necked, was admitted into the Clinical Ward on 30th May. He was in a state of nearly perfect coma, speechless, and with palsy of the right side to such an extent, that even the intercostal muscles of that side did not act. The leg and arm of the left side were occasionally affected with convulsive motions. Breathing stertorous—deglutition much impaired. Pulse 74. The affection was of three days standing, and had come on with vertigo—loss of vision—violent headach and vomiting.

All the usual remedies were employed in the most judicious and active manner without benefit. On the 1st of June, there seemed to be a slight return of intelligence, but he soon relapsed into coma, and died on the 3d, without any change in the other symptoms.

Inspection.—A most minute and careful examination was made of the brain, without discovering any appearance of disease, except that the choroid plexus seemed rather darker than usual, and the basilar artery was diseased at one spot. By the side of the artery there was a spot of the cerebral substance, no larger than a barley-corn, which appeared somewhat softened, but even this Dr. Duncan considered as extremely doubtful.

These, I think, may be considered as fair examples of simple apoplexy in its idiopathic form; I add the following examples of the affection supervening upon other diseases.

Case C.—A lady, aged 50, had been liable for many years to attacks of cough and dyspnœa, which were generally relieved by opiates and blistering. On the 20th of December 1816, she was seized with one of these attacks in the ordinary form. On the 22d she was better, though her breathing was still considerably oppressed. On the morning of the 23d she complained of headach, and wished not to be disturbed. Soon after this she appeared to her family to fall into a sound sleep; but some time after, it was found to be perfect apoplexy, from which nothing could rouse her, and she died about five o'clock in the afternoon. I saw her only an hour before her death; she was then in perfect coma, her lips livid, her breathing quick and oppressed, and her pulse frequent and feeble.

Inspection.—On the surface of the brain the veins were turgid, and the substance, when cut into, exhibited a remarkable degree of vascularity; there was no other appearance of disease. The lungs were distended, and much loaded with thin mucus, but their structure was tolerably healthy. The other viscera were sound.

Case CI.—A lady, aged 45, had for three months before her death been affected with the following symptoms,—nausea and a peculiar uneasy feeling about the

stomach, particularly after meals; a feeling of distention of the abdomen, costiveness of the bowels, and anasarca of the feet and legs. The appetite was tolerable, and the pulse natural, but from being remarkably strong and active, she became feeble, sallow, inactive, and listless. A variety of practice was employed for three months, with little benefit; the anasarca gradually extended; effusion took place in the abdomen, and there was much reason to suspect that it had also taken place in the thorax; the pulse, however, continued of natural frequency and good strength. On the evening of the 18th of May 1816, she was observed to talk hurriedly and incoherently. On the morning of the 19th, she was in a state of stupor, from which at first she could be partially roused; but soon after mid-day it increased to perfect coma. She then lay in a state of perfect apoplexy, with stertorous breathing and much moaning, the face rather pale, the pulse 72, and of good strength, and she died on the morning of the 20th. The catamenia had been regular, except at the last period, which should have happened about the 12th of May.

Inspection.—No disease could be detected in the head after the most careful examination. There was considerable effusion both in the thorax and the abdomen. In the heart there was considerable hardness about the root of the tricuspid valves. No morbid appearance could be discovered in the other viscera.

I have already referred to various cases mentioned by the older writers, in which apoplexy was fatal, without leaving any morbid appearance; and others are related by later authors of undoubted authority. A man, mentioned by Dr. Stark,* after complaining of headach and giddiness, fell down in a state of insensibility, with some convulsion. He then lay in a state of profound apoplexy for forty-five hours, when he died. No morbid appearance could be discovered in the brain on the most careful examination. A young lady mentioned by Dr.

* Works of Dr. Wm. Stark, page 73.

Powel, after appearing for one day very heavy and disposed to sleep, fell into a state of perfect coma, which was interrupted only by occasional attacks of general convulsion. Without any change in the symptoms, she died on the third day. After the most minute examination, no morbid appearance could be discovered in the brain. Andral has described several cases of complete and sudden attacks of apoplexy, in which nothing could be discovered but slight appearances of increased vascularity on parts of the brain. One of them, which was fatal in two days, was accompanied by hemiplegia. Dr. Bright has also described several cases, chiefly complicated with diseases of the lungs, in which there were strongly marked symptoms of oppressed brain, while nothing was to be discovered on dissection but some appearance of increased vascularity. Similar cases are related by other writers, and, upon the whole, I think we have sufficient ground for stating it as a fact, that there is a modification of apoplexy which is fatal, without leaving any morbid appearance that can be considered as accounting for the symptoms.

§ II. —Apoplexy with serous effusion.

Case CII.—A gentleman, aged 80, but vigorous and active, and of rather a spare habit, about the 9th of June, 1813, began to be affected with loss of recollection, indistinctness of speech, and flushing of the face. He appeared to have at times a weakness of the right arm, being observed occasionally to drop things from the right hand, but he did not admit that he felt any weakness of it. He complained neither of headach nor giddiness, but said he was weak, and did not feel himself right; the pulse was natural, and of good strength. After a bleeding from the arm, followed by purgatives and a regulated diet, he seemed to be much improved; he had in a great measure recovered his recollection, and had lost the flushing of his face; and his speech was much more distinct. He walked out regularly, and his

step was firm and vigorous. Soon after, however, he began to have a recurrence of confusion of thought, particularly on the 27th, when, in endeavouring to write a letter, he was obliged to relinquish the attempt. He complained that he could not make sense of it, nor spell the words; the writing was scarcely legible, and the lines were very crooked. On the 28th he seemed much better. On the following night he slept ill; got up about four o'clock in the morning, and said he felt restless and uneasy; he walked about his room for some time, and then returned to bed. Having soon after this become quiet, his family did not disturb him till between eight and nine o'clock, when he was found in a state of perfect apoplexy, his pulse 80 and full, the appearance of the countenance natural; he was incapable of swallowing, and in a state of complete insensibility, except that he occasionally moved his right hand. He was largely bled, after which he became exceedingly pale, and the pulse continued for a considerable time very weak, but without the smallest abatement of the coma. The other usual remedies were then employed without any benefit. In this state of perfect apoplexy he lay for seven days, during which time there was very little change in the symptoms. He frequently moved his right arm and leg, but not the left; he occasionally scratched a herpetic eruption which was on the thigh, and several times moved his night-cap. Once or twice he was observed to open his eyes slightly for a few seconds; the pupil was natural, and contracted when a candle was brought near it. He passed his urine in bed. He never swallowed a drop of any thing. His pulse at first varied from 80 to 100, but afterwards rose to 120. In this state of perfect apoplexy he died on the 5th of February. A few days before his death, a glandular swelling appeared on his neck, from which he evidently felt pain, as he drew away his head when it was touched.

Inspection.—A good deal of fluid escaped when the cranium was opened; there was considerable effusion under the arachnoid, and in the ventricles; the quan-

tity collected was probably from three to four ounces. No other morbid appearance could be detected in any part of the brain.

Case CIII.—A gentleman, aged 70, of a florid complexion, but rather infirm in his limbs, had suffered repeated attacks of loss of recollection, which were said by his family to resemble fainting fits. At the commencement of the illness of which he died, he fell down suddenly deprived of sense and motion. After some time he recovered from this state of perfect insensibility, but his speech was now inarticulate; he had lost the power of his limbs, and his right eye was distorted outward. He was then confined to bed; at times incoherent, at other times more distinct, but always much oppressed, bordering upon coma; his speech continued very inarticulate, and his pulse was generally about 100. His strength sunk gradually, without any particular change in the symptoms; and he died at the end of five weeks.

Inspection.—The ventricles of the brain were found distended with colourless fluid, and there was a considerable quantity under the arachnoid. There was no other morbid appearance.

Case CIV.—A man, aged 41, of a very full habit, had been for some time affected with cough, dyspnœa, and anasarca of the legs, when he became one day suddenly incoherent, and soon after fell into coma. His breathing was much oppressed; his face livid and turgid; the pulse somewhat frequent. The coma was of that kind out of which he could be roused with difficulty so as to answer questions slowly, and heavily, and often incoherently. He died on the 3d day.

Inspection.—Much fluid was found in the ventricles of the brain. The lungs were much loaded with blood, and there was considerable effusion in the cavity of the pleura. In the heart the foramen ovale was open, of the size of a goose-quill.

In concluding this part of the subject, I shall only add the following remarkable case, for which I am indebted to Professor Turner, of extensive effusion in the cranium without any apoplectic symptom.

Case CV.—A gentleman, aged about 70, a man of talent and of genius, had been valetudinary and hypochondriacal for upwards of 30 years, having been affected with a variety of uneasy sensations in the stomach, as indigestion, a sense of tightness across the lower part of the abdomen, and occasionally attacks of dysuria. In the beginning of 1817, he became feeble, listless, and unable for any exertion either of body or mind; during the day he was drowsy, but his nights were restless and feverish. His countenance was pale and sallow; his pulse from 76 to 84; his tongue slightly loaded; his bowels generally costive, but easily moved by medicine, the operation of which was sometimes followed by diarrhœa. A variety of remedies were employed without benefit. He passed the summer without improvement, and in the winter his complaints were aggravated. They consisted as formerly of heaviness, feebleness, and want of sleep, to which were now added a troublesome cough, and constant pain in the lower part of the abdomen, with strangury. His appetite failed; his pulse increased in frequency; and he became daily more and more feeble and emaciated. In the beginning of March, 1818, he was confined to bed; his strength then sunk gradually, and he died on the 14th, having retained his memory and all his faculties entire till within a few hours of his death. He had never complained of headach or giddiness, and never had any paralytic or convulsive affection.

Inspection.—A copious effusion of transparent fluid was found over the whole surface of the brain under the arachnoid membrane, which, in various places, particularly at the posterior part, elevated that membrane in the form of small bladders, and separated some of the convolutions from each other, so as to form depressions

on the surface of the brain. The ventricles were also distended with fluid, but not much enlarged. The brain was in other respects sound; the viscera of the abdomen were healthy. The bladder was contracted and thickened, but there appeared to be no disease of the prostate gland or the urethra.

In the former part of this work, I have referred to several cases in which extensive effusion was found in the brain, without any apoplectic symptoms. The fluid in one of them amounted to eight ounces, and several other cases of the same kind are on record. Dr. Marshall mentions a maniac, who died of mortification of his feet; a few hours before death, he became perfectly rational, yet effusion was found both on the surface of the brain and in the ventricles, amounting to more than a pound.

The apoplectic cases in which we find only serous effusion, constitute that modification of the disease which has been called serous apoplexy. In regard to this affection, or rather to this mode of expression, I submit the following observations.

I. The distinction which has been proposed betwixt sanguineous and serous apoplexy is not supported by observation. The former is said to be distinguished by flushing of the countenance and strong pulse, and by occurring in persons in the vigour of life; the latter by paleness of the countenance and weakness of the pulse, and by affecting the aged and infirm; and much importance has been attached to this distinction, upon the ground, that the practice, which is proper and necessary in the one case, would be improper or injurious in the other. I submit that this distinction is not founded upon observation; for, in point of fact, it will be found that many of the cases which terminate by serous effusion, exhibit, in their early stages, all the symptoms which have been assigned to the sanguineous apoplexy; while many of the cases, which are accompanied by paleness of the countenance and feebleness of the pulse,

will be found to be purely sanguineous; and one modification of the disease in particular will be described, in which these symptoms are very strikingly exhibited, while the disease is found to be sanguineous apoplexy in its most hopeless form. Portal has described a series of cases which afford the same result; of three, which presented all the symptoms of serous apoplexy, one was saved by repeated bleeding, and in the other two, which were fatal, there was found extensive extravasation of blood. Case CI. lately described, forms a remarkable addition to these observations. If any case could be confidently considered as serous apoplexy, this was such. Dropsical effusion had existed in the body for months; and in defiance of every remedy, it had been progressively gaining ground. There were symptoms indicating its existence both in the thorax and in the abdomen; the patient then became comatose, with pale countenance, and died; but though dropsy was found in the other cavities, none could be detected in the brain.

II. In other parts of the body, serous effusion is very seldom a primary disease; it arises as a result either of inflammatory action, or of impeded circulation, and takes place slowly, not accumulating at once in such quantity as to induce urgent symptoms. It is, therefore, in the highest degree improbable, that it should occur in the brain as a primary disease, and accumulate with such rapidity as to produce the symptoms of an apoplectic attack.

III. The quantity of fluid effused bears no proportion to the degree of the apoplectic symptoms. We find it in small quantity though the apoplectic symptoms had been strongly marked and long continued; we find it in large quantity when the symptoms have been slight; and, finally, we find most extensive effusion in the brain where there have been no apoplectic symptoms at all. The direct inference from these facts is, that in the cases of apoplexy with effusion, the presence of the fluid cannot be considered as the cause of the apoplectic symptoms.

The facts which have been related in this section appear to warrant the following conclusions.

1. There is a modification of apoplexy which is fatal, without leaving any morbid appearance that can be discovered in the brain.

2. There is another modification, in which we find serous effusion, often in small quantity.

3. The cases which are referable to these two classes are not distinguished from each other, by any such diversity of symptoms as can be supposed to indicate any essential difference in their nature.

4. Without any apoplectic symptoms, we find serous effusion in the brain in an equal or in a greater quantity than in the cases of the second modification.

5. It is therefore probable, that in these cases the effusion was not the cause of the apoplectic symptoms.

6. It is probable, that the cases of the first modification depend upon a cause which is entirely referable to a derangement of the circulation in the brain distinct from inflammation.

7. It is probable, that the cases of the second modification are, at their commencement, of the same nature with those of the first; and that the serous effusion is to be considered as the result of that peculiar derangement of the circulation, which constitutes the state of simple apoplexy. In other words, it is probable, that the affection which has been called serous apoplexy is to be considered as simple apoplexy terminating by effusion.

SECTION II.

OF THE CASES OF THE SECOND CLASS NOT PRIMARY APOPLECTIC.

The cases to be described under this section differ remarkably from those which are properly styled apoplexy.

They are not at first apoplectic; or, if there be at the very first attack loss of sense and motion, this state is recovered from in a few minutes, or perhaps seconds, without any remedy. The prominent symptom, at the commencement of the disease, is a sudden attack of violent headach, the patient often starting up and screaming from the violence of it. Sometimes he falls down pale, faint and exhausted, often with slight convulsion, but recovers from this state in a very short time. In other cases he does not fall down, but feels a sudden and great uneasiness in his head, generally with paleness, sickness, and often vomiting. The first attack being so far recovered from that the patient is often able to walk home, the symptoms go on under various modifications. The fixed pain in the head generally continues, often referred to one side of the head; and generally there is vomiting. The patient continues for some time, perhaps an hour or two, cold and feeble, with cadaverous paleness of the countenance; his pulse weak and generally frequent. He is quite sensible, but oppressed. By degrees he recovers heat and the natural appearance of the countenance, and the pulse improves in strength. The face then becomes flushed; he is more oppressed; he answers questions slowly and heavily; and at last sinks into coma, from which he never recovers. The period occupied by these changes varies exceedingly in different cases. In one case to be described, there intervened, from the first attack to the commencement of coma, 5 hours, in a second, 12 hours, in a third, 3 days, and in a fourth, not more than 15 or 20 minutes. Death followed the appearance of coma in the first of these cases in 7 hours, in the second in 32 hours, and in the third in two days. Other varieties occur which will be exemplified by the cases. Sometimes the coma follows so speedily, that the case closely borders upon the attack of simple apoplexy. But I think there is almost always a certain interval of sense, generally with violent complaint of pain, and not that immediate and complete loss of sensibility which occurs in what may be strictly called the apoplectic attack.

In Case CXI. again, after the first attack there was an interval of a fortnight, without any urgent symptom; the complaint then returned, and was speedily fatal. In Case CXII. which seems to belong to this class, after the coma had continued three days, there was a complete recovery from it, succeeded by maniacal delirium. This, after seven days, was again followed by coma, which in three days more was fatal. In Case CIX. there was also, after evacuations, a temporary recovery from the coma, about 12 hours after its appearance, and 20 hours before death.

As far as my observation extends, the cases which belong to this class are generally fatal. They form a modification of the disease, remarkably different from the simple apoplectic state; and, on inspection, we find none of those varieties and ambiguities which occur in the apoplectic cases, but uniform and extensive extravasation of blood. From the whole history of them, I think there is every reason to believe, that they depend upon the immediate rupture of a considerable vessel, without any previous derangement of the circulation, the rupture probably arising from disease of the artery at the part which gives way. At the moment when the rupture occurs, there seems to be a temporary derangement of the functions of the brain, but this is soon recovered from. The circulation then goes on without interruption, until such a quantity of blood has been extravasated as is sufficient to produce coma. In their whole progress, these cases are strictly analogous to those of extravasation on the surface of the brain, from external injuries. The patient recovers from the immediate effects of the injury, walks home, and after some time, perhaps an hour or two, becomes oppressed and at last comatose. The extravasated blood being in this case removed by the operation of trephine, the coma disappears. The varieties of the symptoms which occur in this form of the disease, are such as we might expect upon this view of the nature of the affection. In some cases it is probable that the extravasation goes on progressively, until such a quantity has been accu-

mulated as is sufficient to produce the fatal coma. In others there is reason to believe that soon after the rupture has taken place, the hæmorrhage is stopped by the formation of a coagulum, and after a considerable interval bursts out afresh and is fatal. This probably occurred in Cases CX. and CXI.; and in such cases, the two extravasations can sometimes on inspection be distinguished from each other by their appearance. In other cases, again, the second extravasation takes place in another part of the brain; and this probably occurred in Case CXII. In this case, the temporary recovery from the coma was remarkable—the apoplectic state having taken place two hours after the attack, and having continued for three days. At that time, it is probable, the evacuations employed had the effect of restoring the circulation, which then went on in a very imperfect manner, until it was again interrupted by the fresh extravasation. The rapidity with which the disease advances, in cases of this class, will of course depend in a great measure upon the size of the vessel from which the hæmorrhage has taken place. In some cases, it will be seen to be very slow in its progress, and, in others, extremely rapid,—a very short interval taking place betwixt the first attack and the occurrence of perfect coma. Even in some of these cases, however, the patient survives a considerable time; but in others the fatal event likewise takes place with very great rapidity. In some cases, again, the slowness with which the symptoms advance is very remarkable. A man mentioned by Dr. Bright, first lost the power of the thumb and two next fingers of the left hand, but continued his work for four days, when he lost the use of the whole arm. A few days after this his leg became weak, and gradually completely paralytic. The case was fatal in a month, without perfect coma, and a coagulum was found in a cyst in the right hemisphere.

The following selection of cases will illustrate the principal varieties of this very interesting modification of the disease.

§ I.—The coma rapidly supervening on the first attack.

Case CVI.—A clergyman, aged 55, while delivering his sermon during the morning service of Sunday, 13th May, 1827, was observed to stop and put his hand to his head; he then attempted to go on, but talked indistinctly, and had evidently lost his recollection; he supported himself by grasping the side of the pulpit. Assistance being immediately given him, he was taken out, and at this time was speechless and paralytic of the right side, but appeared to be sensible. He became rapidly more and more oppressed, and, in about twenty minutes from the commencement of the attack, had become entirely comatose. From the time when he was taken down from the pulpit, he was pale and cold, and his pulse extremely feeble; and this state continued when I saw him, about an hour after the attack; so that, though a vein was opened, very little blood could be obtained. Gradually the circulation rallied, and, in another hour, a full bleeding was obtained without any relief. All the other usual remedies were employed without benefit. From the time when the coma took place, there never was the slightest abatement of it; he lay with his eyes shut, his countenance pale and sallow, but placid and without distortion,—his pulse weak, the power of swallowing lost, the breathing at first stertorous, afterwards slow and oppressed. He lived in this state till Monday at mid-day, about twenty-four hours after the attack.

Inspection.—There was extensive extravasation of blood in the left ventricle, which had passed partly into the right by laceration of the septum. It seemed to have made its way into the ventricle from the substance of the brain on the outer and anterior part, where there was a large irregular lacerated cavity, full of coagulated blood, and communicating with the ventricle; all the arteries of the brain were extensively ossified.

CASE CVII.—A man aged 32, of a very full habit, while sitting by the fire on the evening of the 3d September 1804, was suddenly seized with violent headach, followed by vomiting. After a few minutes he began to talk incoherently, and soon after fell down in a state of insensibility, accompanied by a slight convulsion. His face was extremely pale, his body cold, and his pulse scarcely to be felt. From this state, which resembled syncope, he passed gradually into the appearance of apoplexy; and, three hours after the attack, his breathing was stertorous, the body of natural heat, the pulse 72 and of good strength. The face was still pale, he had frequent vomiting, and was incapable of swallowing, and there had been no diminution of the coma. He now lay in a state of profound coma, and died 29 hours after the attack, without any change in the symptoms, except that, during the last 12 hours, the pulse varied from 100 to 112. Large bloodletting and the other usual remedies had been employed without the least benefit.

Inspection.—All the ventricles of the brain were found distended with coagulated blood, which appeared to have burst into them from an irregular lacerated opening in the substance of the brain.

§ II.—AN INTERVAL OF PERFECT RECOLLECTION FOR SEVERAL HOURS BETWEEN THE ATTACK AND THE OCCURRENCE OF COMA.

CASE CVIII.—A gentleman, aged 46, of short stature, full flabby habit, and sallow complexion, a literary man, and very sedentary, while speaking in a public meeting on the 28th April, 1807, was seized with an uneasy sensation in his head, "as if his head would have burst," or "as if the brain had been too big for the skull." This feeling soon went off, and he continued his speech; but when he had finished it he left the room, and felt himself extremely unwell. He had cold shivering, nausea, and repeated vomiting; com-

plained of headach and faintness; his face was pale, and his pulse feeble. After some time he was able to walk home, where I saw him at nine P. M. an hour or more after the attack. He then complained of violent pain in the right side of his head, which came on in paroxysms, and in the intervals, he was much easier; he had nausea and repeated vomiting; he felt himself cold and faint; his face was pale and sallow; his pulse weak and rather frequent; he was quite sensible, but much oppressed, and answered questions very slowly. He was immediately bled from the arm, and, the pulse improving under the bleeding, it was continued to about 30 ounces, but without relief. He became gradually more and more oppressed, and by 11 P. M. had sunk into coma, with stertorous breathing, and complete insensibility. In this state he continued till six o'clock on the following morning, when he died. More blood had been taken from the temporal artery, and the other usual remedies employed without the smallest benefit. During the last six hours of his life, the pulse varied exceedingly, being sometimes slow and oppressed, sometimes frequent and full, and the transitions from the one state to the other were very sudden; a short time before death it was strong and frequent. The pupil of the eye had retained its natural appearance, and no paralytic symptom was observed in any period of the attack.

Inspection.—A large quantity of coagulated blood was found spread over the surface of the brain, under the dura mater, in all directions, chiefly on the right side. The origin of it was evidently from the substance of the right hemisphere, from which it had burst outwards by a large ragged opening. This opening communicated with a cavity in the substance of the hemisphere, which also was full of coagulated blood. Large coagula were likewise found under the base of the brain, around the cerebellum, and about the upper part of the spinal cord. In the ventricles there was about an ounce of serous fluid.

Case CIX.—A lady, aged 70, healthy and active for her years, had complained for a day or two of headach, but without being confined, or her health otherwise affected, till the evening of the 7th August, 1816, when she suddenly screamed out from violent headach, vomited, and then fell down in a state resembling syncope; her face was extremely pale, and her pulse scarcely to be felt; and there was some slight appearance of convulsion. She recovered in a few minutes and went to bed. Through the night she was restless, vomited repeatedly, and three or four times fell into a kind of fainting fit, of a few minutes duration. In some of these she was reported to have made a gurgling noise in her throat, and to have shown some convulsive motions of the arms; in the intervals she was quite sensible, and complained of headach. About eight o'clock in the morning of the 8th she sunk into coma. I saw her for the first time about ten; she was then completely comatose; breathing stertorous; face rather pale; pupil contracted; pulse of good strength and a little frequent. The usual remedies were employed, and in the evening she had so far recovered, that, when raised up in bed, she took into her hand a glass containing some purgative medicine, and drank it. She seemed to attempt to speak, but could not; and soon after relapsed into perfect coma; pulse at night 112; there seemed to be no paralysis. (9th,) continued in perfect coma, and died at four in the afternoon.

Inspection.—In the anterior lobe of the right hemisphere of the brain, there was a cavity containing a mass of coagulated blood the size of a small hen's egg. From this cavity the blood had forced a passage through the substance of the brain downwards, and had spread in all directions under the base of the brain, and upwards on both sides, betwixt the dura mater and the arachnoid, to such an extent, that portions of it were found on the upper surface of the brain on both sides of the falx. The substance of the brain surrounding the cavity was soft and much broken down. There was nothing

in the ventricles, and all the blood-vessels appeared remarkably empty.

§ III.—An interval of three days between the attack and the occurrence of coma.

Case CX.—A gentleman, aged 18, previously in good health, after using rather violent exercise in the forenoon, had returned home before dinner, and was sitting near the fire, when, without any warning, he started up, pushed his chair backwards with violence, exclaimed, "Oh my head!" and instantly fell on the floor insensible, and slightly convulsed. I saw him within ten or fifteen minutes after the attack. By that time he had recovered his recollection, was sitting on a chair, and was quite distinct. His face was extremely pale, and his whole body cold and shivering: he complained of severe headach, and his pulse was weak and rather frequent. Bloodletting was immediately employed, and his pulse improved under it. It was repeated after a few hours, with the addition of purgatives, and the other usual remedies. The coldness and paleness went off after some time, and he then complained only of severe headach, with a feeling of stiffness of his neck, and pain extending downwards along the cervical vertebræ; his pulse was rather frequent and of good strength. He continued in this state for two days, the headach varying very much in degree, and frequently complained chiefly of his neck; his pulse was frequent, 120 or more, and of good strength; the other functions were natural; he was quite distinct; had the use of all his limbs, and could get out of bed with little assistance, and sit up a considerable time. On the third day he began to be more oppressed, and a little confused and forgetful; the other symptoms as before. On the fourth he sunk very gradually into coma, and died on the 5th. His pulse had continued from 120 to 140; there had been no paralytic symptom; but, on the fifth day, there was repeated convulsion. Bloodletting and all

the other usual remedies had been employed without benefit.

Inspection.—All the ventricles of the brain were completely filled with coagulated blood. In the substance of the left hemisphere there was a cavity formed by laceration of the cerebral substance, filled also by the coagulum, and communicating with the ventricle. There was no other morbid appearance.

§ IV.—The fatal coma occurring a fortnight after the first attack.

Case CXI.—A lady, aged 56, enjoying good health, except occasional disorders in the stomach, on Tuesday, the 30th July 1816, walked out in perfect health; had gone but a very short distance, when she was seized with violent pain in the head and giddiness; soon after, she lost her recollection and fell down. She very soon recovered her recollection, and was carried home, being unable to stand. She was then seen by Mr. White, who found her pale and faint; the pulse 70 and weak. She was a little incoherent, complained of severe headach, and had repeated vomiting. The vomiting recurred frequently for two days, and then subsided; the severe headach continued a week. During this period, she was generally confined to bed, but was sometimes able to sit up for a short time; her face was pale; her pulse from 70 to 76 and rather weak; she had some appetite, but bad sleep. She had no paralytic symptom, and made no complaint except of the constant pain of her head, which was always referred to the back part. At the end of the week, this pain became much less severe; she then complained chiefly of pain in the back and limbs, and some dysuria; her pulse was as formerly, and her mind entire. In this manner she passed another week, still confined to bed, but, towards the end of the week, she appeared to be much better. On Tuesday, 13th August, exactly a fortnight from the first attack, she was suddenly seized with violent pain in the

head, chiefly referred to the back part of it; in less than an hour she became comatose; and in three hours more was dead. The face had continued pale, and the pulse natural. I did not see this patient during her life, but was present at the examination of the body.

Inspection.—In the substance of the anterior lobe of the right hemisphere of the brain, there was a cavity filled by a coagulum of blood, the size of a hen's egg. From this cavity a lacerated opening led into the right ventricle, and all the ventricles were completely filled by coagulated blood. A thin stratum of blood was also found under the base of the brain, which seemed to have escaped from the ventricles, by forcing a passage under the posterior pillars of the fornix. Around the cavity in the right hemisphere, the substance of the brain was much softened and broken down. Both the kidnies were unusually vascular; about the right, there was a remarkable turgescence of veins, and an appearance of extravasated blood in the cellular membrane behind it.

§ V.—Two distinct extravasations.

Case CXII.—A lady, aged 40, of a spare habit, on the 15th May, 1811, at two o'clock P. M. was suddenly seized with headach, accompanied by vomiting and diarrhœa: and at the same time began to talk incoherently. She continued to talk incoherently for two hours, and then sunk into coma. I saw her at five; she was then in a state of perfect coma; face pale; the skin rather cold; the breathing soft and natural; the pulse 65, soft and rather weak. During the afternoon, she had frequent vomiting and repeated diarrhœa; no other change took place in the symptoms. Full bleeding was employed and a blister on the head; but she was incapable of swallowing. 16th, 17th, and 18th, She continued in a state of perfect coma; never opened her eyes nor showed the least sensibility, except that she drew away her arm with violence when she was

bled. She frequently moved all her limbs, and occasionally turned in bed. The pupil contracted a little when a candle was brought near it: the face was sometimes a little flushed, but generally pale. The pulse was from 70 to 80, and of good strength. There had been no return of the vomiting or diarrhœa after the 15th. Bleedings, both general and topical, were employed, with purgatives, &c. On the evening of the 18th, she came out of the coma rather suddenly, like a person awaking from sleep; looked around her, put out her tongue when desired, and took what was offered to her; she also talked a little, but incoherently. (19th and 20th,) Much incoherent talking; appeared at times to understand what was said to her, but could give no account of her feelings, only said, she was "very bad;" pulse from 70 to 80. (21st, 22d,) Incessant talking and delirium; at times unmanageable and attempting to get out of bed; at these times the face was flushed, at other times it was pale; pulse varying from 90 to 120, weak and irregular; appeared to be blind, but had the use of all her limbs. (23d,) Highly delirious and maniacal. (24th, 25th,) Became calm and manageable, and at times very weak. Pulse small and feeble, skin cold with a clammy sweat; appeared at times to see and to know those about her. (26th,) Relapsed into coma; lay with her eyelids half shut, and the eyes distorted outwards; pulse from 80 to 100, and rather weak; face pale; was incapable of swallowing. Continued in a state of perfect coma on the 27th and 28th, and died in the afternoon of the 29th;—the pulse had continued about 90.

Inspection.—All the ventricles of the brain were full of a dark-coloured fluid like coffee. In the substance of the right hemisphere, there was a cavity containing a coagulum of blood, the size of a hen's egg. This cavity communicated with the ventricle, and the substance of the brain immediately surrounding the cavity was very soft and much broken down. In the left hemisphere, at its upper and posterior part, there was a cavity the size of a large walnut. It contained a dark-

coloured matter which appeared to be coagulated blood, but considerably changed in its appearance, being firmer in its texture than recent blood, and of a brownish colour mixed with portions of a lighter colour, which appeared to be diseased cerebral substance. The substance of the brain surrounding this cavity was much softened and broken down.

Some part within the substance of the hemispheres, as in these examples, seems to be the most common origin of the hæmorrhage in cases of this class. It is, however, sometimes found in the ventricles only, though more rarely. In the following Case it was confined to the third and fourth ventricles.

§ VI. — The extravasation confined to the third and fourth ventricles, with remarkable disease of the arteries of the brain.

Case CXIII.—A gentleman, aged 55, of a thin spare habit, had, about six months before his death, an attack of hemiplegia, which, after the usual treatment, subsided gradually. On the 10th October, 1819, he complained suddenly after dinner of giddiness and sickness; he went into another room, where he was found a few minutes after, supporting himself by a bed-post; he was then confused and pale. Being put to bed, he soon became partially comatose, with muttering and frequent attempts to speak. I saw him more than an hour after the attack. He was then pale and sallow, pulse soft, languid, and rather slow. His eyes were open, but he did not seem to comprehend what was said to him. A vein was opened, which bled very little, the circulation appearing extremely languid. Some time after, he was bled again by Dr. Aitkin, when the blood flowed more freely, but without relief. He became completely comatose, and died about three o'clock in the morning.

Inspection.—In the lateral ventricles there was a considerable quantity of bloody serum; the third and fourth

ventricles were full of coagulated blood. The arteries of the brain were in a great many places in a remarkably diseased state, being extensively ossified; and there was in many places a singularly diseased state of the inner coat of the artery. It was much thickened, and of a soft pulpy consistence; and large portions of it could be squeezed out when a piece of the artery was compressed between the fingers.

In the cases now described, the hæmorrhage appears to have taken place from the deep-seated arteries of the brain. In the two following cases, for which I am indebted to Dr. Barlow of Bath, and Dr. Hunter of this place, it appears to have been from the superficial vessels.

§ VII.—Extravasation on the surface of the brain.

Case CXIV.—A gentleman, about 63 years of age, tall and slender, and of temperate habits, was seized with apoplexy on the morning of the 2d of May, 1822. He was promptly relieved by bleeding, continued well through the day, and, on the morning of the 3d, appeared free from complaint. About two o'clock, however, there was a return of the attack, when he was again bled copiously, but without the effect of restoring consciousness. He was now seen by Dr. Barlow, and all the usual remedies were employed in the most active manner without relief. On the 4th, he was still comatose, and continued so till ten o'clock at night, when consciousness returned, but continued only for a very short time. On the 5th, he had an interval of recollection which lasted three hours; and he was again sensible for about a quarter of an hour in the evening. He had a similar interval for about an hour and a half on the 6th, but on the 7th was comatose nearly the whole day. On the 8th, there was a slight return of consciousnesss in the morning; and towards the evening, he was sensible for several hours. During

these changes, the bowels had been fully opened, the pulse had continued about 72 and soft, and no paralysis of any limb had been observed. On the 9th, he was still lethargic, with some stertor; but, after topical bleeding and the operation of a purgative, he was much relieved; passed a quiet night, and on the morning of the 10th he was quite sensible. It was now first observed that he had lost the sight of the right eye, which was distorted outwards. On the 11th, he lay with his eyes shut, but took food, and answered questions intelligibly when he was spoken to. On the 12th, he was lethargic, but capable of answering questions when he was roused; and this state continued on the 13th. On the afternoon of that day, there was an increase of stupor, with difficulty of swallowing. He was again partially relieved by leeches, a purgative, and a blister to the neck, but the relief was only temporary. He became gradually more comatose, and died early on the 16th.

Inspection.—A copious extravasation of blood was found extended over the surface of the brain; it was closely adherent to the dura mater, and could be peeled off like a membrane. The substance of the brain was healthy. There was no effusion in the ventricles.

In the communication with which Dr. Barlow has favoured me in regard to this singular case, he remarks, "the frequent returns of consciousness seemed to warrant a hope that no irremediable extravasation had taken place: yet the event proved that extensive sanguineous effusion had existed throughout. Was the lethargy owing to the extravasation?—and if so, why, under a permanently existing cause, was the effect so variable?" These interesting queries I do not at present attempt to answer.

Case CXV.—A man, aged about 35, keeper of a tavern, and addicted to the constant use of ardent spirits, had been drinking to intoxication during the night betwixt the 12th and 13th July, 1816; and, about seven o'clock in the morning, was found lying in a

state of violent convulsion. No account could be obtained of his previous state, except that, during the evening he had drunk a very large quantity of whisky, and that, when he was last seen about three o'clock in the morning, he was walking about his house, but unable to speak. He was seen by Dr. Hunter, at a quarter before eight. He was then lying on his left side, in a state of perfect insensibility, with laborious breathing; saliva was flowing from his mouth; his eyes were much suffused, and greatly distorted,—the cornea of both being completely concealed below the upper eyelid; pulse 120, full and soft. While Dr. Hunter stood by him, he was again seized with convulsion; it began in the muscles of the jaw, which was drawn from side to side with great violence, producing a loud jarring sound from the grinding of the teeth. The spasms then extended to the body and extremities, which were first thrown into a state of violent extension and then convulsed for one or two minutes; they then subsided, and left him as before in a state of perfect insensibility. Similar attacks took place four times while Dr. Hunter remained in the house, which was about half an hour; and he expired in another attack of the same kind about ten minutes after. Bloodletting, and every other remedy that the time admitted of, were employed in the most judicious manner.

Inspection.—On removing the skull cap an appearance was observed on the surface of the dura mater, of coagulated blood in small detached portions. These appeared to have been discharged from small glandular-looking elevations on the outer surface of the dura mater, which were very vascular, and highly gorged with blood. There were depressions on the inner surface of the bone, which corresponded with these bodies. On raising the dura mater, there came into view a coagulum of blood, covering and completely concealing the right hemisphere of the brain; it was about two lines in thickness over the middle lobe, and became gradually thinner as it spread over the anterior and posterior lobes, and dipped down below the base of the

brain. The coagulum being removed, was found to amount to about $\frac{3}{3}$v. On the surface of the left hemisphere, the veins were turgid with blood; on the surface of the right, they were entirely empty; but the source of the hæmorrhage could not be discovered. There was no fluid in the ventricles, and no other disease was discovered. The stomach being carefully examined, was found to contain nothing but air and some healthy mucus.

The following case, for which I am indebted to Dr. Macaulay, is altogether a remarkable one. It is the most rapidly fatal case of cerebral disease that has occurred to me.

Case CXVI.—A woman, aged 54, who had been for several years liable to headach, attended a crowded meeting on the evening of 25th June 1829, and seemed in perfect health. Towards the conclusion of the meeting she uttered a loud and convulsive scream, and instantly fell down in a state of insensibility. She was immediately carried out and was seen by Dr. Macaulay, who happened to be present: he found her pale and totally insensible, and the pulse feeble: and within five minutes from the first seizure she was dead.

Inspection.—The integuments of the head were much loaded with blood. On removing the dura mater, there was a thin but very extensive appearance of extravasated blood, or rather ecchymosis, which covered nearly the whole surface of the brain. In the substance of the anterior lobe of the right hemisphere there was a coagulum of blood the size of a large bean. All the other viscera were examined in the most accurate manner, but nothing was discovered, except a tubercle on the liver, and a small spot of ossification on the abdominal aorta.

When the disease takes place in the cerebellum, or below it, the symptoms appear to be more rapid in their progress than when it is in the substance of the brain: the two following cases will illustrate this modification

of the disease; for the second of them I am indebted to the late Dr. Hennen.

§ VIII.—Extravasation in the cerebellum.

Case CXVII.—A woman, aged about 70, a midwife, of a full habit and short stature, while sitting by the bed of a lady whom she was attending, suddenly exclaimed, "I am gone!" and almost immediately fell down in a state of coma, with some vomiting. She lay in a comatose state, without any change in the symptoms for 40 hours, and then died.

Inspection.—A coagulum of blood, the size of a pigeon's egg, was found in the right lobe of the cerebellum. There was no other morbid appearance.

Case CXVIII.—A private in the 10th Hussars, of a spare habit, about a month before his death, was attacked with a pain in the back of his head, for which a blister was applied, and the pain soon went off. On the 22d July, 1819, he was seized with giddiness and fell down; on being raised he vomited, and complained of violent headach and faintness, but was quite sensible; he was very pale, and his pulse was slow and languid. Being carried to the hospital, he continued in the same state; asked for cold water, which he swallowed, and seemed relieved of the faintness, but continued very pale. In a few minutes his eyes became fixed; he drew deep inspirations, and in two minutes more was dead. From the moment of seizure, he did not move either the upper or lower extremities.

Inspection.—Nothing unusual was discovered in the brain. On raising the tentorium, the vessels of the cerebellum appeared very turgid. On removing the cerebellum, a coagulum of blood of about two ounces was found under it, and surrounding the foramen magnum.

§ IX.—Extravasation in the substance of the tuber annulare.

Case CXIX.—A gentleman, aged 37, had been for several months in bad health, being affected with occasional tightness of the chest and difficulty of breathing. He had also severe dyspeptic complaints, with occasional vomiting, a yellow tinge of his skin, and considerable uneasiness in the region of the liver. For these complaints he had been advised by his medical attendants in the north, to go to Cheltenham, and arrived in Edinburgh with that intention on 22d March, 1823. I saw him on the following day along with Mr. Wishart. We found his pulse frequent, his countenance sallow, and his expression febrile and anxious. He complained chiefly of tightness across his chest, with some pain in the region of the liver. Respiration was very imperfect along the right side of the thorax, and there was some œdema of the legs. By topical bleeding, purging, &c. he was considerably relieved; and on the 24th he expressed himself as feeling much better, but his pulse continued frequent. On the morning of the 25th he was suddenly seized with giddiness, noise and confusion in his head, and numbness of the whole right side. He was oppressed, but not comatose; answered questions distinctly, but in a loud voice, and with a peculiar manner. He complained chiefly of noise in his head, of a tight and cramped feeling of his right arm and leg, with much prickling and loss of command of the parts, but when desired to grasp another person's hand with his, the muscular power did not seem to be diminished. The expression of his countenance was vacant and fatuous; the eye was natural. The face was slightly distorted, and the speech was in some degree embarrassed. The pulse was 120.

After large bloodletting and the other usual remedies, the symptoms gradually assumed a more favourable aspect, and, after four or five days, he was considered as being out of any immediate danger, though

the effects of the attack were by no means removed. His pulse was now natural, his speech was distinct, and his mind entire; his sight was good, and the appearance of the eye natural, except a slight degree of paralysis of the upper eyelid of the right side. His breathing was easy, and he made no complaint, except of the tight and cramped feeling with numbness of the right arm and leg. His look, however, continued vacant and peculiar. His appetite and digestion were good, and his bowels easily regulated. He was improving in strength, and was able to be out of bed part of the day. This favourable state continued till the 14th of April, on which day he was found with a very frequent pulse, without any other change in the symptoms. This febrile state continued on the two following days with rapid failure of strength, and he died on the evening of the 16th. He continued sensible to the last, and during this febrile attack, he seemed to have acquired an increased command over the limbs of the affected side.

About the commencement of his illness of 25th March, he complained of considerable uneasiness in passing his urine; for a day or two it was bloody, and there was a good deal of tenderness in the region of the bladder. After a few days this subsided, and he began to pass considerable quantities of puriform fluid of remarkable fetor, which subsided to the bottom of the chamberpot, after the urine had stood for a short time. This continued during the remainder of his life, though it had greatly diminished in quantity for several days preceding the last febrile attack. The urine was in sufficient quantity and passed without difficulty.

Inspection.—The brain and cerebellum were found in every respect in the most healthy state, and no vestige of disease was discovered until the cerebellum was separated from the tuber annulare. In doing so a cavity was exposed about the size of a large hazel nut, lined by a soft cyst, and full of dark grumous blood of a firm consistence. This remarkable cavity was formed partly in the substance of the tuber, and partly betwixt it and the base of the cerebellum. It was decidedly

more to the left side than the right, and the surrounding substance was softened, and tinged with dark red points, as if from injection of dark blood. There was effusion in the thorax to the amount of at least lb.ii. The right lung was contracted, and extensively hepatised; the left was much loaded with sero-purulent fluid. The liver was very considerably enlarged and of a pale ash-colour and granular texture. The left kidney was pale, indurated, and tubercular. The inner surface of the bladder was deeply injected, and in several places showed distinct round ulcers about a quarter of an inch in diameter.

§ X.—Extravasation in all the ventricles and along the whole course of the spinal cord.

The following case shows the most extensive extravasation of blood that has ever occurred to me. It is also remarkable from the period of life at which the affection took place, and its similarity in the symptoms to one of the common inflammatory affections terminating by effusion.

Case CXX.—A boy, aged 9, previously in perfect health, awoke in the night of 18th May, 1829, complaining of headach; had vomiting and slight convulsion. On the 19th, he was seen by Mr. W. Brown, who found him still complaining of headach with occasional vomiting, but without any urgent symptom. Under the usual treatment the complaint seemed gradually to subside, and on the 25th he appeared to be entirely recovered. But on the afternoon of that day, he had a return of convulsion, and in the evening complained much of headach. Pulse 64.—26th and 27th, said he was better, but seemed drowsy. Pulse slow. Bowels obstinate.—28th, had two attacks of convulsion, the second of which was very severe, and continued for several hours, affecting chiefly the left side of the body. Pulse 130. On the 29th he was again better; but from

this time he became gradually more and more drowsy, and at last comatose with squinting, and occasional convulsive motions of the limbs, and he died on the 3d of June. His death was preceded by severe convulsion of several hours duration. I saw him along with Mr. Brown from the 29th.

Inspection.—The surface of the brain was healthy. The lateral ventricles were distended with dark bloody fluid, and each of them contained a mass of coagulated blood; that in the right was the size of a large walnut, the other smaller. The 3d and 4th ventricles were quite filled with coagulated blood in a very firm state, and from the bottom of the fourth ventricle, the coagulum was traced outwards and spread along the base of the brain and cerebellum, and around the medulla oblongata. The spinal canal being now laid open, the dura mater of the cord appeared remarkably distended, and the cord was found through its whole extent entirely enveloped by a very firm and uniform stratum of coagulated blood. The brain and cord were in their substance healthy, and the source of the hæmorrhage could not be discovered.

§ XI.—Extravasation in a cyst, formed by separation of the laminæ of the dura mater, from rupture of the middle meningeal artery.

The following remarkable case was lately communicated by Dr. John Gairdner, to the Medico-Chirurgical Society of Edinburgh, and will appear, in a more detailed form, in the next volume of their transactions.

Case CXXI.—A man, aged 48, about the 12th of November, 1814, was assisting a neighbour to carry a heavy load to the top of a high stair, when he felt a sudden attack of headach. He was, from that time troubled with headach and occasional giddiness, increased by stooping;—and after these symptoms had

continued rather more than a fortnight, he became sensible of some imperfection of vision. When seen by Dr. Gairdner on the 2d of December, he complained of violent headach. Pulse 40, and feeble.—The pupils were at this time sensible to the light, but after a few days became insensible. He sunk very gradually into coma, without any other remarkable symptom, and died on the 13th.

Inspection.—On the left side of the head, a cyst was found, in the course of the middle meningeal artery, occupying the region of the lower part of the parietal and upper part of the temporal bone. It was formed by a separation of the laminæ of the dura mater, and contained about four ounces of coagulated blood. The portion of the dura mater forming the cyst was considerably thickened and very vascular. There was a depression on the surface of the brain, corresponding to the cyst,—and the ventricles contained a considerable quantity of serous fluid. There was no other morbid appearance.

The source of the hæmorrhage in cases of extravasation in the head appears to be exceedingly various.

I. The most common is probably the rupture of a vessel of moderate size in the substance of the brain, from which the blood bursts by laceration either into the ventricles, or to the surface, or in both these directions at once, as in a case described by Morgagni. It is in vain in general to attempt tracing it to particular vessels; Dr. Cheyne was able to do so in some instances; but, in general, numerous vessels must be laid open by the extensive laceration, and hence probably the appearance which has been observed, as if the extravasation had taken place from various points at once. A case is described by Serres in which the rupture took place in the substance of the pons Varolii; and from this the blood had burst forth into the occipital fossa.*

* Annuaire Med. Chirurg.

II. The superficial vessels. This probably took place in the remarkable cases communicated by Dr. Hunter and Dr. Barlow. This appears to be the meningeal apoplexy of Serres. The blood seems in general to be accumulated betwixt the dura mater and the arachnoid; and two cases of this kind have been described by Andral; but cases have been described by Fernelius and Tulpius, in which the blood appeared to be confined beneath the pia mater, and to have been discharged from the retiform plexus of vessels at the base of the brain. In Case CXXXI. again, the cyst, which seemed to have contained the extravasation, appeared to have been formed in the cellular tissue of the arachnoid itself.

III. From ulceration and rupture of one of the principal arterial trunks. Dr. Mills has described a case in which the hæmorrhage was distinctly traced to ulceration and rupture of the basilar artery; and a similar affection of the internal carotid is described by Morgagni and by Serres.

IV. From the vessels of the choroid plexus, as in a case described by De Haen. This may probably be the source of hæmorrhage in those cases in which it is confined to the ventricle, without any laceration of the substance of the brain. In Case CXIII., it was confined to the third and fourth ventricles. Dr. Bright, also, has described a case which was fatal in twenty minutes, in which the extravasation, amounting to about three ounces, was confined to the ventricles, without any rupture of the cerebral substance. He supposes it to have proceeded from the vessels of the velum interpositum.

V. Rupture of one of the sinuses, as in a case described by Dr. Douglas,* in which the left lateral sinus was ruptured.

VI. From the rupture of small aneurisms in various parts of the cerebral vessels. In a case by Serres, such an aneurism occurred in the basilar artery, which, when

* Edin. Med. Essays and Observ. vol. vi.

it was distended, was as large as a small hen's egg. A pound of blood had been discharged by the rupture of it. This man had long been subject to a feeling of weight in the head, and, according to his own statement, to an indescribable stupidity, which was much increased by bodily exertion, and by strong liquors. In the Archives Generales de Medecine, a case is described, in which apoplexy followed the bursting of a small aneurism in the circle of Willis; and Dr. Bright describes a case, which occurred in a lad of 19, from the rupture of a small aneurism of one of the smaller branches of the middle cerebral artery.

VII. In the Medical and Surgical Register of the Hospital of New York, a very uncommon case is described by Dr. Watts, in which the hæmorrhage took place betwixt the dura mater and the bone, from erosion of a vessel in connexion with caries of the inner surface of the parietal bone of the left side. The man was suddenly seized with hemiplegia of the right side, and died in five days. The carious spot on the inner surface of the bone was not so large as a sixpence. In Case CXXI., I have described a form of the disease, equally uncommon, in which the extravasation took place, from rupture of the middle meningeal artery, in a cyst formed by separation of the laminæ of the dura mater.

In the most common form of this affection, in which the hæmorrhage proceeds from a vessel in the substance of the brain, I have supposed the rupture to take place from disease of the artery itself, without any relation to that congestive or hæmorrhagic condition which seems to constitute the state of simple apoplexy. Such disease, accordingly, will be very generally found to exist in cases of this class. It consists in some instances of ossification of the arteries in various places, and in others, of that peculiar earthy brittleness, which Scarpa has described as leading to aneurism; and the canal of the artery will be found in many places to be considerably narrowed or contracted at the hardened parts, and sometimes entirely obliterated. In other cases again,

numerous branches of the principal arteries of the brain will be found to present a succession of small opaque osseous rings, separated from one another by small portions of the artery in a healthy state. This is a very common appearance in the brains of elderly people, and the rings are generally from half a line to a line in breadth, and are separated from each other by healthy portions of about the same extent. In some cases again the inner coat of the artery is much thickened, of a soft pulpy consistence, and very easily separated; so that, when a portion of the artery is compressed between the fingers, a considerable quantity of this pulpy matter is forced out. This was very remarkable in Case CXIII. In a case of apoplexy very rapidly fatal, which occurred to the late Dr. Duncan, and Mr. Wishart, they took particular notice of the remarkably diseased state of the arteries of the brain, which they describe as exhibiting everywhere the "earthy brittleness of Scarpa."

There is much reason to believe, that this diseased condition of the arteries of the brain may give rise to a variety of complaints in the head; and that, after going on for a considerable time in this manner, it may at length be fatal by rupture. This appears to be probable from the history of many cases. I shall only give the following as an example.

Case CXXII.—A gentleman, aged about 50, was for several years affected with complaints in his head, which assumed a great variety of characters. He had at first attacks of giddiness and headach, with loss of recollection and impaired speech. These occurred from time to time, and went off without leaving any bad consequences. After a year or two, the symptoms became more permanent, and he had violent paroxysms of pain, which at one time were much relieved by arsenic. He then had attacks bordering upon mania, with loss of recollection for several days. Afterwards he had epileptic attacks, alternating with these maniacal paroxysms. He next was affected with attacks of stupor of various duration. The disease went on in this way for

several years; and he died at last in May 1820, after an apoplectic attack which continued eight or nine days.

Inspection.—Connected with the fatal attack, there was a coagulum of blood, the size of an egg, in the substance of the right hemisphere. The only other morbid appearance was a remarkably diseased state of the whole arterial system of the brain. It was most extensively ossified, with a thickened and very diseased state of the inner coat of the arteries, and partial separation of it from the other coats in many places. Scarcely any branch could be traced through the whole brain entirely free from disease. The vertebral arteries were also much affected, especially the left, which was much enlarged, and its coats thickened, ossified in spots, and brittle.

The state of the arteries in such a case as this, with the partial separation of the inner coat, could not fail to be productive of much disturbance of the circulation, and much derangement of the functions of the brain. Another case will be afterwards mentioned, in which a similar disease appeared to have led to frequent paralytic attacks; the patient died at last of gangrene of the toes. (Case CXXV.) See also the disease in the basilar artery described in Case XXXV., in which it was entirely obstructed and distended by a firm white matter, without any appearance of blood.

It appears that a disease somewhat similar occurs in the veins of the brain, as in the following remarkable case, with which I have been favoured by Dr. Cheyne of Dublin.

Case CXXIII.—A lady, aged 42, was of a melancholy temperament, and had been subject to headachs from early life. About ten years before her death, she lost her husband under circumstances of peculiar distress, and from that time confined herself to the house, and laboured under the greatest dejection of mind. She was liable to frequent attacks of bilious diarrhœa, and her old headachs became more constant and more severe.

In one of these attacks she became apoplectic and died.

Inspection.—There was a turbid effusion betwixt the arachnoid and pia mater, and the whole surface of the brain was blood-shot. The venous system of the brain was diseased after an unusual manner. There was a deposition of a firm yellowish-white substance between the lining and outer coat of the veins; it was universal all over the brain, giving to the veins a mottled or rather ribbed appearance. The appearance of the whole of the arterial system was precisely the same as the venous, and both the arteries and veins were thicker but more fragile than usual. The medullary portion of the brain was more than usually vascular; on the inner side of the posterior horn of the left lateral ventricle, there was an irregular cavity about an inch in length and half an inch in breadth. The portion of the brain which formed the walls of the cavity was much diseased, soft and yellow; its structure was destroyed, and it was penetrated by a number of enlarged and unsupported vessels. The left choroid plexus contained an hydatid the size of a large pea.

This important subject has been little investigated, but there seems every reason to believe that disease of the venous system of the brain may have a most extensive influence in the affections of that organ. Various examples of this class will be found in the preceding observations, particularly the complete obstruction of the lateral sinus which occurred in Cases IV. and V., and the remarkable disease of the veins on the upper surface of the brain in Case XXX. The subject is worthy of careful investigation, and promises important results. A lady mentioned by M. Gendrin, having been exposed to mental agitation on the seventh day after accouchement, became insensible, and continued so for three quarters of an hour. On her recovery, she complained of acute pain in the left side of the head, which continued with little change for ten days, notwithstanding topical bleedings, and various other remedies. There

was then a great and sudden increase of it, accompanied by pain in the left ear, and this was soon followed by palsy, first of the right arm, and soon after of the right leg. Three days after this, there was loss of speech with partial stupor, then convulsive attacks, and strabismus; and she died on the 17th day of the disease. On inspection, the middle cerebral vein on the right hemisphere, where it approached the longitudinal sinus, was found very large and containing a puriform substance which entirely filled it; and the corresponding vein on the left side was in the same state. There was also extensive disease of the longitudinal sinus, its cavity, for several inches, being entirely degenerated into an irregular cellular mass, infiltrated with purulent matter mixed with blood. In the posterior part of the left hemisphere, there was extensive ramollissement, mixed with purulent matter. The ventricles were empty. This affection is also described by Dr. Bright. In a child, aged 20 months, who died after an illness of three weeks, with headach, squinting, and frequent convulsion, he found all the larger veins running into the longitudinal sinus, quite round and hard, being filled with a yellow-coloured coagulum, as if they had been injected with wax. This appearance extended through one or two subdivisions in some parts, and the longitudinal sinus itself was found full of a coagulum, taking the exact form of the sinus, which seemed to be almost entirely composed of fibrin, with a little of the red blood in parts and cavities. There was effusion in the ventricles, and ramollissement in various parts of the brain.

SECTION III.

OF THE CASES OF THE THIRD CLASS, OR THE PARALYTIC CASES.

UNDER this class I have included a description of cases which resemble each other in their symptoms only, but are found to differ most remarkably in the morbid conditions of the brain with which they are connected. We are not possessed of sufficient information to enable us accurately to discriminate them from each other; and all that we can attempt, at present, is to give a statement of the facts relating to them, under a simple arrangement.

The leading phenomenon of this class is the paralytic attack without coma, or at least without that complete and permanent coma which occurs in the former classes. Some of those cases, indeed, which begin as a paralytic attack, after a certain time pass into apoplexy, the paralytic attack being only the prelude to, or the first stage of, the apoplectic; these of course belong to another class, particularly the second. The cases which I mean to include under this third class are those in which, either there has been no apoplexy, or the apoplectic state has soon passed off, leaving the paralysis as the more prominent and permanent character of the disease.

The attack appears under various forms; the most common of which is hemiplegia with loss of speech; but in some cases the speech is not affected; while in others, the loss of speech is at first the only symptom. In some cases, again, one limb only is affected, which is most commonly the arm, though sometimes the leg. Numerous other modifications occur, as, palsy of one eyelid; or of the orbicularis of the eye; distortion of the eyes; double vision; twisting of the mouth, &c. Loss of the power of swallowing also occurs occasionally, though more rarely in the cases which do not pass into apoplexy. The patient frequently appears quite sen-

sible of his situation, and makes anxious attempts to express himself; generally understanding in a great measure what is said to him, and answering by signs. Sometimes, however, when he retains a partial power of speech, his answers are incoherent and unintelligible.

In the farther progress of cases of this class, we observe remarkable varieties, which may be chiefly referred to the following heads.

I. Such an attack may be merely the prelude to the apoplectic, and may pass into it after a short interval. These cases belong chiefly to the second class.

II. The attack may, under the proper treatment, pass off speedily and entirely, leaving, after a very short time, no trace of its existence.

III. The recovery may be very gradual, the use of the affected limbs being restored after several weeks or months.

IV. The palsy may be permanent; that is, the patient, after a certain time, may recover so far as to be able to walk about, dragging his leg with a painful effort, and to speak very imperfectly; and after this, makes no farther improvement to the end of his life, which may be protracted for many years.

V. In a fifth variety the patient makes no recovery; he is confined to bed, speechless and paralytic, but possessed of his other faculties in a considerable degree, and dies gradually exhausted, after several weeks or months; in some cases without coma, in others with coma for a few days before death.

In endeavouring to investigate the morbid conditions of the brain which are connected with these varieties, we find considerable diversities, which, in a pathological point of view, may be referred to the following heads.

I. Many of the cases appear to have a close analogy to simple apoplexy; and when they are fatal, present either no satisfactory appearance, or only serous effusion, often in small quantity.

II. Extravasation of blood of small extent, contained

in defined cysts in the substance of the brain or under the membranes.

III. Ramollissement of the cerebral substance.

IV. Inflammation and its consequences.

§ I.—Paralytic cases, with serous effusion, or with slight morbid appearances.

When a paralytic attack of the most formidable appearance passes off speedily and entirely, without leaving any trace of disease, we may suppose that no very serious injury has been done to the substance of the brain; and that the disease bears a close analogy to the affection which I have termed Simple Apoplexy; or, in other words, that the cause had consisted of a state of the circulation of the brain, which is capable of being speedily and entirely removed. Many cases again are fatal, and present, on dissection, only serous effusion, often in small quantity. A man, mentioned by Morgagni, had palsy of the right arm, and died apoplectic in two days. On dissection, no morbid appearance was discovered, except serous effusion, both in the ventricles and on the surface of the brain. Another had loss of speech, and palsy of the left side, and died comatose at the end of a month. Considerable effusion was found on the surface of the brain, but very little in the ventricles. A third had loss of speech and palsy of the right side, then became comatose, and died in five days. The ventricles contained about two ounces of fluid; there was also a good deal on the surface of the brain, which appeared to be most abundant on the right side.

I have formerly given my reasons for believing, that serous effusion in apoplectic cases is not a primary disease but a termination of simple apoplexy; and I have described cases in which it existed to a considerable extent without paralysis. In the cases, again, in which it has been accompanied by paralysis, the quantity of fluid has borne no proportion to the symptoms, and has been equally distributed over the brain; except in the

case now quoted from Morgagni, in which too, it is worthy of remark, it appeared to be most abundant on the same side with the disease. From these considerations, I think we may conclude, that, in the cases now referred to, the effusion was not the cause of the paralysis, but the effect or the termination of a certain state of the circulation in a part of the brain, with which the paralysis had been connected from the first invasion of the disease. The whole phenomena of palsy, do indeed bear evidence, that certain cases of it depend upon a cause, which is of a temporary nature, and capable of being very speedily and entirely removed. We see hemiplegia take place in the highest degree, and yet very rapidly disappear; but the most singular circumstance, connected with certain cases of palsy, is, that we occasionally see it continue without any improvement for many weeks or months; and then, from some change which entirely eludes our observation, take a turn for the better, and very suddenly disappear.

I do not know to what class I ought to refer the following case, but I shall introduce it here as the most remarkable example that has occurred to me, of long-continued palsy, without any satisfactory morbid appearance.

Case CXXIV.—A gentleman, aged 35, while standing in the street, conversing with a friend, suddenly lost his speech; he recovered it after a few minutes, walked home, and made no particular complaint. In the evening of the same day, he suddenly fell from his chair, speechless, and paralytic on the right side, but without coma; being sensible of what was said to him, and answering by signs. He was then confind to bed for several weeks without any change in the symptoms. At the end of three months, he had recovered so far the motion of his leg, as to be able to walk a little, dragging forward the leg by a motion of the whole right side of his body. He afterwards improved considerably in bodily strength, so that he could walk for several

miles; but his thigh and leg continued to be dragged forward by the same kind of effort, without any farther improvement. He never recovered any degree of motion of the arm or hand; he could not even move the fingers; his speech was very inarticulate, and his countenance was expressive of great imbecility of mind. In this state he continued without relapse, and without any farther improvement, for fifteen years, when he died at the age of 50. For a month before his death, he had been declining in strength. I saw him about four days before he died, and found him in a state resembling typhus; his pulse frequent and weak; his tongue very foul, and dry in the middle; he made no complaint. He was not then in bed, but was confined to it next day, and died in three days more, of rapid sinking without coma.

Inspection.—The membranes adhered firmly to each other, and to the brain, at a spot the size of a shilling, on the upper part of the right hemisphere. There was a large quantity of fluid under the arachnoid membrane, and a considerable quantity in the ventricles. Near the posterior part of the longitudinal sinus, a small part of the sinus appeared to be thickened in its coats, and the inner surface of this part was dark-coloured and slightly fungous. The cauda equina was of a remarkably dark colour, as if it had been soaked in venous blood, but without any change in its structure. No other morbid appearance could be detected, on the most careful examination, in any part of the brain or spinal cord.

The remarkably diseased state of the arteries of the brain, which has been already referred to, as a very common appearance in elderly people, may probably be the cause of temporary interruptions of the circulation and slight paralytic attacks, which after some time may pass off from changes which elude our observation. Perhaps something of this kind occurred in the following case, for which I am indebted to Dr. Simson.

Case CXXV.—A gentleman, aged 58, in 1805,

was attacked with hemiplegia of the right side, without coma. After the usual treatment, he improved gradually; and at the end of five months, he had quite recovered, except that his right leg continued rather weaker than the other. In 1812, he had another attack, preceded by violent headach. From this likewise he gradually recovered, though his recovery was much less perfect than after the former attack. He had four other attacks betwixt 1812 and 1817, which were carried off by the usual remedies, bloodletting and purging. In 1817, he had another and severe attack, likewise in the right side; his speech was unintelligible, and his mouth much drawn to the left side. He was relieved by bloodletting, &c. but from the effects of this attack he did not recover. He remained paralytic in the right side, his mouth twisted, and his speech very indistinct. In November, 1818, he began to be affected with gangrene of the toes, which advanced slowly, and terminated fatally in April 1819. From the time of his first attack, in 1805, to the second, in 1812, he always became confused and felt headach, when he attempted to read or write, so that he was obliged immediately to desist; but after the attack in 1812, he was able to read and write without any confusion or uneasiness, and even without the use of spectacles, which he had formerly employed.

Inspection.—The dura mater seemed considerably thickened; the pia mater also seemed thickened, and was very vascular. There was extensive disease in the arteries of the brain, their coats being thickened, and in many places ossified. This was very remarkable in the principal trunks of the carotids and vertebrals, and was likewise traced into the smaller branches. The internal carotids seemed considerably larger than usual, and their coats were much thickened; and the vertebrals and their branches were affected in the same manner in a still greater degree, particularly about the tuber annulare, where the basilar artery was quite brittle, and gave off its branches in the same condition.

M. Gendrin has described a case of several months

standing, in which nothing could be discovered but a diseased state of one of the posterior arteries of the brain, and a very slight softening of part of the cerebellum. There seems every reason to believe that such cases often depend upon disease of the arteries of a portion of the brain.

§ II.—Paralytic cases accompanied by extravasation of blood of small extent.

The symptoms which appear in connexion with extravasation of blood in the brain, seem to depend in a great measure upon the quantity that has been extravasated. In the cases which go on to apoplexy, the blood seems in general to burst by laceration of the cerebral substance, either to the surface, or into the ventricles. In the paralytic cases, it seems to be confined to a certain defined cavity in which the hæmorrhage at first took place. This may be in any part of the substance of the hemispheres; the corpus striatum is a very common seat of it; and it may be found in the substance of the pons Varolii, or of the medulla oblongata. It may likewise take place on the surface of the brain, as in Case CXXXI. in which the cyst which had contained it was distinctly seen in the cellular structure of the arachnoid. Extravasation of a certain extent, either in the substance or on the surface, seems, in general, to produce palsy of the opposite side; and as the quantity increases, the case seems to pass into apoplexy; but it appears that extravasation may take place and produce fatal apoplexy, without having induced paralysis. Several cases have been already described in which this took place, though in all of them there was a considerable interval betwixt the attack and the occurrence of coma.

When the extravasation is of more limited extent, so as to be confined to a cavity of moderate size in the substance of the brain, the patient is in general affected with palsy and loss of speech, wthout perfect coma; or,

if there be coma for a time immediately after the attack, it passes off after a certain interval, and the prominent character of the disease comes to be the state of paralysis. In the farther progress of the cases of this class, we find remarkable varieties. Some of them pass, after a certain time, into fatal coma, even when the extravasation of blood is of no great extent; while, on the other hand, we shall find that the patient may recover entirely from the effects of extravasation of a certain extent, and may even recover from the immediate effects of very extensive extravasation, and survive in a paralytic state for many years. The cause of this difference seems to depend, in a great measure, upon the state of the surrounding cerebral substance. When extravasation of small amount is fatal, it seems in general to be connected with ramollissement of the cerebral substance to some extent around the cavity which contains the coagulum. There is also some reason to believe, that extravasation of very small extent, in fatal cases, may sometimes be considered as the effect of the state of simple apoplexy; and that, in these instances, the fatal event is not to be ascribed to the extravasation, but to the state of simple apoplexy, which we have seen may be fatal without either extravasation or effusion. This may be considered as in some measure conjectural, but the other is more a matter of fact; namely, the effect of ramollissement of the cerebral substance surrounding the coagulum in producing a fatal disease, while we see in other cases, extravasation of greater extent entirely recovered from. The ramollissement in these cases seems to arise from a diseased state of the arterial system of the part, the same probably which generally gives rise to the extravasation.

When the cerebral substance surrounding the extravasation continues in a healthy state, we find that coagula of very great size are gradually and completely absorbed. This remarkable change seems to commence at a very early period, but to advance very slowly. When we have an opportunity of seeing the coagulum,

so early as fourteen or fifteen days from the attack, we find it already considerably changed in its character from the appearance of recent blood. The thinner parts have considerably disappeared, and the coagulum has become firmer in its texture, and of a dark brownish colour. In its farther progress, it assumes a firm and fibrous texture; the dark red colour is gradually lost, and the last portion that remains is a small mass of fibrin of a slight reddish colour, which, after a certain time, also entirely disappears. The time required for this process must of course depend in a great measure upon the size of the coagulum, but seems likewise to be in part regulated by other circumstances. In Case CXXVII. a coagulum, which must have been of very considerable size, had entirely disappeared in less than five months. In Case CXXX. it was seen partly absorbed at the end of three months. On the other hand, Moulin found a small coagulum not quite gone at the end of a year; and Riobé observed some of the blood still remaining in a cavity of small extent, after twenty months. In two cases, Serres found a hard coagulum of blood remaining, in the one at the end of two years, and in the other at the end of three years.

While these changes are going on in the coagulum, the cavity in which it is contained becomes lined with a distinct firm membrane of a yellowish colour; and when the coagulum has entirely disappeared, we find the cyst remaining, and forming a distinct and well defined cavity, which is generally entirely empty. Bands of the same yellow matter which forms it are frequently seen crossing it in various directions, and producing a connexion betwixt its opposite sides at these points. The French writers believe that the cyst is at last entirely obliterated; but I have never seen any thing to satisfy me that it is so. I have examined such cysts at various periods of their progress, but have seen nothing like an approach to obliteration, except the bands which I have now mentioned, connecting their opposite sides, unless in Case CXXXII. in which a part of the cavity did appear to be obliterated by the adhesion of its sides.

The cyst appears to be distinctly organized, and numerous blood vessels have sometimes been observed ramifying upon it. It does not appear precisely at what period this remarkable membrane is deposited. Riobé describes it in one case, as existing three weeks after the attack; and, in another, he thought he observed the formation of it begun in a very soft state as early as thirteen days. M. Gendrin has given an interesting description of it in a case which was fatal in thirty-six days. The cavity was the size of a pullet's egg, and was situated between the thalamus and corpus striatum. The coagulum being carefully removed, the cavity was found to be lined by a delicate semipellucid membrane; which presented, when held up to the light, numerous vascular striæ. The coagulum did not appear to have undergone any change: and the opinion of M. Gendrin seems to be, that the absorption of the coagulum does not commence till this membrane is fully formed.

In the cases which I have had an opportunity of observing, after the disappearance of the coagulum, the cyst has in general been entirely empty. It appears, however, that it has been frequently observed by the French writers full of serous fluid. Their idea is, that serous fluid is deposited from the exhaling vessels of the membrane, and is again absorbed, after dissolving a part of the coagulum; that in this manner the coagulum gradually disappears; and that the membrane then continues to deposit and reabsorb the serum, until the cavity is obliterated. I have already stated, that in my observation, cavities even of large size are found entirely empty. Andral, however, has described several cases, in which the cysts were found containing serous fluid, many years after the symptoms had disappeared.

Moulin has described a case of seventeen years standing, in which the patient had continued paralytic, with wasting of the affected limbs, and had never recovered his speech. He found a cyst containing four ounces of fluid which was tinged with blood.

As the absorption of the coagulum goes on, the

symptoms in some cases subside gradually, and entirely disappear; but in others the improvement is but partial, and we find that the coagulum had been entirely removed, while the patient continued to be affected with a great degree of palsy to the end of his life. In other cases again, the symptoms appear to go off speedily, though there was every reason to believe that a coagulum was present, and could not yet be absorbed. This probably occurred in Case CXXX. It appears that extravasated blood may be absorbed in the same manner from the ventricles, though in cases of this kind it more rarely occurs in that situation. A man, mentioned by Riobé, had an attack of apoplexy, which left him affected with palsy of the left side. He improved very gradually, and was entirely recovered at the end of eighteen months, when he died of peripneumony. In the right lateral ventricle, there was a small quantity of coagulated blood, and the membrane lining the ventricle was of a yellowish colour, and much thickened. In Case CXXXI. I have described an example of absorption from the surface of the brain, the cyst being formed in the cellular structure of the arachnoid, but having the same characters as the cysts which are found in the substance of the brain.

The following selection of cases arranged under several heads, will illustrate this modification of the disease. I shall describe the first case at some length, as it shows very remarkably the various stages of this interesting affection.

A. *The cyst empty—the patient dying of another disease.*

Case CXXVI.—A clergyman, aged 29, had complained for several weeks of frequent headach, which affected him chiefly in the morning. On Tuesday, 30th November, 1819, he walked out in his usual health about 11 o'clock in the forenoon, and about half an hour

after went into a shop, when he was found to be speechless, and with his mouth twisted to one side. He was immediately taken home; he had then the use of all his limbs, and was able to walk about his room; he talked incoherently and inarticulately, his mouth was very much twisted to the left side, but he seemed to know his friends. Soon after, he became more incoherent and partially comatose, but resisted violently when he was bled. Pulse of natural frequency. I saw him soon after the bleeding; he was then rather pale, and the pulse natural; he made eager attempts to speak, and when disturbed, sometimes became violent; but his speech was quite inarticulate, and he did not appear to comprehend what was said to him. After farther bleeding, purging, &c., he became more intelligent, and on the following day, 1st of December, he was much more sensible; he knew those about him, and occasionally answered questions distinctly, when the answer that was necessary was very short; when he attempted more than this, he wandered into incoherence, and often appeared very anxious to describe something,—but not a word could be understood. He had the use of all his limbs, and occasionally got out of bed with great agility to obtain something which he wanted, when he could not make the attendant comprehend what he meant. Farther bleeding and purging were employed, and there was a progressive improvement. On the 3d, he was able to speak correctly, though slowly and heavily, as if endeavouring to recollect a word which he meant to make use of. He now gave a distinct account of his seizure on the 30th; he said "he felt a violent headach attack him suddenly while he was pulling on his boots immediately before going out, and that it continued after he went out; he remembered going into the shop of a person whom he named, and the person telling him that he was very ill and must be taken home." From this time he improved progressively, and by the 18th was in his usual health, except some slight remains of thickness of speech, and a slight degree of confusion for a few minutes after first awaking in the morning. These

symptoms soon disappeared, and he enjoyed very good health till about 15th November, 1820, when he was suddenly seized in the afternoon with loss of speech and palsy of the right arm. I saw him in an hour after the attack; little or no blood could be obtained from a vein, but the temporal artery, being opened very low down, bled freely to 20 ounces, when he became faint. He then took purgatives; next day he was much better, and in a few days the symptoms were entirely removed.

He now continud well for about a month. On 16th December, 1820, he went into the country on horseback; about three miles from town he was observed by a person who passed him, running by the side of his horse nearly speechless, and with the appearance of a person intoxicated. In this state he went to the house of a person with whom he was acquainted, but could not make himself understood, and soon after his arrival became completely comatose. The usual remedies were employed without any immediate effect. During the remainder of the 16th, and through the whole of the 17th, he continued in a state of perfect coma, notwithstanding repeated bleeding to faintness, and the other usual remedies. On the 18th, about five o'clock in the morning, he came out of the coma, and from this time recovered gradually. On the 21st, he was able to be out of bed and to walk steadily, and was soon after restored to his usual health, except that his speech continued considerably indistinct. After some time, he began to complain of headach, notwithstanding very abstemious diet; this was relieved by bleeding, and for a considerable time it was necessary to repeat small bleedings once in two or three weeks. In this manner he enjoyed tolerable health, but never entirely recovered from the effects of the last attack; his speech continued thick and somewhat indistinct; his mind was evidently weakened; his countenance was vacant, and his temper was irritable. But he engaged in all the ordinary transactions of life, and in the lighter duties of his profession, such as baptism and marriage; he never preached, though he was very anxious to attempt it; he had the

use of all his limbs, and was able to take a great deal of exercise. He continued liable to headach, for which he was bled occasionally, and once had an attack of hæmoptysis, which went off in a few days. He continued in this state till the 20th of May, 1822, when he began to be affected with cough, dyspnœa, and frequent pulse; and of this affection in the chest he died, on the 7th of June, without any recurrence of the symptoms in the head.

Inspection.—In the substance of the left hemisphere of the brain, about the centre, and about equally distant from the ventricle and the surface, there was a cyst an inch and a half long, and one inch deep. It was quite empty, but was lined by a yellowish firm membrane of considerable thickness. This membrane could be easily separated from the surrounding cerebral substance, to which it adhered very slightly. In the substance of the right hemisphere, in a situation exactly corresponding to the former, there was another cyst of a similar character but smaller. It was a narrow sinus, and of a diameter which could have admitted a quill; it was like the other quite empty, but lined by the same kind of yellow membrane; there was a small quantity of clear fluid in the ventricle; there was no other morbid appearance. In the lungs, there was slight hepatisation and extensive disease of the bronchial membrane.

Case CXXVII.—A gentleman, aged 56, in one of the last days of June 1826, while walking through the museum of the University of Edinburgh, was suddenly seized with loss of speech. He walked with difficulty and some assistance to the house of a friend in the neighbourhood, where it was first observed that he had lost the use of his right side. After a short time he became nearly comatose, and continued so for some days. After repeated bleeding, purging, &c., he became gradually more sensible; but it was now found that he had lost almost entirely the memory of words, though he appeared to comprehend what was said to him. He gradually recovered the use of his leg, so as to be able to walk a

little. But his arm made very little improvement, and both his speech and his memory of words continued very imperfect; his recollection of persons and events seemed to be tolerably good. He was improving very gradually in all respects, till about the end of October, when he began to be affected with a disease of the chest, of which he died in the end of November. The paralytic symptoms continued in a very considerable degree to the last, especially in the right arm, and in his speech, which continued very indistinct. I saw him a short time before his death, along with Dr. Alison, to whom I am indebted for the history of the previous attack.

Inspection.—In the substance of the left hemisphere, on the outer side of the ventricle, we found a cyst about an inch and a half long and one inch deep; it was quite empty, and lined by a yellowish membrane similar to that which has been described in the former case.

Case CXXVIII.—A lady, aged about 50, was attacked with hemiplegia in April, 1817, and, after stupor of several days continuance, came out of it gradually with palsy of the right side, and very indistinct speech. It was several months after the attack when I first saw her. She was then in pretty good general health, but with very little improvement of the limbs. She could drag the leg forward a very little, the arm she could not move at all, and the fingers of the affected hand were bent inwards, and could not be made straight but by some force. Her farther improvement was very slow. In the course of 1818, she acquired more use of her leg, being able to support herself with a stick, and to walk a few steps; her speech also became more distinct, but the arm continued completely paralytic. She had made no farther improvement, when, in August 1819, she began to complain of breathlessness, and died rather suddenly in a fit of dyspnœa.

Inspection.—The ventricles of the brain contained several ounces of fluid, and it appeared quite evident to all who were present at the examination, that the left

ventricle was much larger than the right. On the outer side of the left ventricle, and separated from it by sound cerebral substance of about a quarter of an inch in thickness, there was a cyst similar to those described in the former cases; it extended longitudinally nearly three inches, and was as much or more in depth; it terminated below in an angle, corresponding with the narrow edge of the middle lobe of the brain, which lies in the angle of the sphenoid bone, behind the clinoid process; the cavity extended here to within a quarter of an inch of the base of the brain. This remarkable cavity was entirely empty; it was lined by a fine yellow membrane, and bands of the same substance with the membrane intersected it in several places, connecting the opposite surfaces, which in other places, though in contact, were quite unconnected. This membrane existed throughout the whole cavity, and was quite obvious even in the sharp angular termination already mentioned. The brain was in other respects healthy. There was considerable effusion in the pleura, and extensive accumulation of puriform mucus in the bronchial canals.

B. *The cyst empty—the patient dying of a fresh attack.*

Case CXXIX.—A lady, aged 40, on the 10th of April, 1821, complained in the morning of violent headach, and had some vomiting; soon after she was seized with perfect palsy of the right side, with very inarticulate speech, and a considerable degree of coma. She was relieved by the usual treatment; the symptoms subsided gradually, and in eight or ten days she was quite well. She occasionally felt a slight degree of weakness of the side which had been affected, but she merely expressed it by saying that it was different from the other, and she continued to enjoy good health until August 1822, when she had another attack in which the right side was again affected. She soon recovered from the immediate effects of this attack, but the leg and arm continued long very weak, and her speech was indistinct,

with considerable confusion of thought; and, during the following winter, she was able for very little exertion. In the summer of 1823, she improved considerably, so that she could walk a good deal leaning upon the arm of another person; her speech was more distinct, and her mind very considerably improved. It was, however, obvious that the effects of the attack were not entirely removed, as she still dragged her leg a little in walking, and had less command of the right hand than of the left. She was going on in this manner, and in other respects enjoying pretty good health, when, in December 1824, she was suddenly seized, while sitting at breakfast, with palsy of the left side, and twisting of the mouth; and soon after became comatose, with total loss of the power of swallowing. She died in four days.

Inspection.—In the right hemisphere of the brain, towards the anterior part, there was a coagulum of blood the size of a pigeon's egg; it lay on the outside of the ventricle, and closely bordering upon it, but without any communication. In the corresponding situation in the left hemisphere, there was a cyst, running obliquely backwards on the outside of the ventricle, and quite distinct from it. It was about an inch and a half long, and nearly an inch in depth; it was quite empty, and lined by a soft yellowish membrane. This lady was likewise affected with extensive disease of the ovarium, on account of which I had seen her at different times, both before and in the intervals of the paralytic attacks along with Dr. Beilby.

C. *Two cysts empty—the coagulum partly absorbed from a third—the patient dying of a fresh attack.*

Case CXXX.—A man, aged 56, in the end of November, 1822, had an attack of hemiplegia of the right side, with loss of speech, from which he recovered after the usual treatment; and at the end of a fortnight was in his usual health, except that he felt a degree of stiff-

ness of the affected limbs. He, however, made no complaint, but returned to his usual employment, as keeper of a tap-room, and to his usual mode of living, which was eating and drinking without restraint. He continued to go on in this manner till the end of February 1823, when he was found one afternoon, in his cellar, lying in a state of perfect apoplexy. He died in thirty-six hours.

Inspection.—In the left ventricle of the brain there was bloody serum, with some coagulated blood, which appeared to have burst from a cavity in the substance of the hemisphere on the outer side of the ventricle. This cavity contained a coagulum of the size of a pigeon's egg, and communicated with the ventricle by a small ragged opening. The surrounding cerebral substance was in some places considerably softened. Behind this cavity, but separated from it by sound cerebral substance, there was a smaller cavity, which was seated in the posterior part of the left thalamus. It contained a small quantity of grumous blood, of a very dark colour, but not sufficient to fill it, a great part of the cavity being in a colapsed state. Exactly opposite to this cavity, in the posterior part of the right thalamus, there was another cavity capable of containing a small bean. It was quite empty, but lined by a firm soft membrane, of a yellow colour. In prosecuting farther the dissection of the brain, a fourth cavity was met with in the substance of the medulla oblongata, or rather under the pons Varolii ; it was capable of containing a very small bean, but empty like the other, and lined by a similar membrane. On inquiring further into the history of this man, I afterwards found that he had had two attacks previously to the first of those above described ; the one eighteen months before his death, and the other at a former period. Both were said to have been very slight, and to have produced only numbness of his arm for a few hours ; I could not obtain a more particular account.

D. *The cyst on the surface.*

Case CXXXI.—A gentleman, aged 74, in April 1823, had an apoplectic attack which seized him suddenly in the evening. He fell down deprived of sense and motion, and on partially recovering, was found to be without palsy, except in his speech, which was quite unintelligible. He had then considerable stupor, bordering upon coma, and at times showed great restlessness and impatience in his ineffectual attempts to make himself understood. After large and repeated bleeding, and the other usual remedies, he gradually improved, so that after six or seven weeks he was able to walk out, and was in good general health, but with very inarticulate speech, and considerable confusion of mind. In conversation, he was evidently aware of what he meant to say, but could not make it intelligible to others; he put one word for another, or the name of one article for another, often in a ludicrous manner; he could not name persons, though he evidently recognized them; and on one occasion, while he was walking in the street with a friend, being very anxious to say something to him in regard to another gentleman whom he could not name, he hurried his friend along to the door of the gentleman's house and pointed to the name plate. In this manner he passed the summer, and the following winter, and great part of the following summer, being in good bodily health, but restless and unhappy in his mind, and with the same confusion of thought and inarticulate speech. He was incapable of reading a word, or of expressing himself intelligibly on any subject, except to those who were constantly with him, who got into the way of understanding him on ordinary topics. In the end of summer 1824, he began to have complaints in his chest of which he died on the 19th of December. On the day on which he died, he was more distinct in his mind than he had been at any time since the attack.

Inspection.—There was an unusual quantity of fluid under the arachnoid, so that at least eight ounces were

collected; and when it was all discharged the brain seemed remarkably collapsed. The arachnoid and the pia mater were considerably thickened. The only other morbid appearance was a deposition of a firm yellowish matter, on the outer side of the left hemisphere; it extended about three inches from before backwards, and in depth corresponded to about the lower half of the hemisphere. This substance, when closely examined, was found to be a collapsed cyst; and it appeared to be formed betwixt the arachnoid and the dura mater, or partly involved in the arachnoid. It exactly resembled the substance which is found lining the cysts in the substance of the brain; and there seemed to be little doubt, that it had been the seat of an extravasation which had been absorbed. There was extensive ossification of the arteries of the brain; the substance of the brain was healthy. There was considerable effusion in the thorax, with enlargement of the heart, and disease of the valves.

Attempts have been made in cases of this class to establish a connexion between the seat of the disease and the particular organs which are affected; but these attempts do not seem to have been attended with much success. Serres has concluded that the arm is chiefly affected, when the extravasation is in the posterior part of the hemisphere, and the leg when it is in the anterior part, or in the corpus striatum. Bouillaud has been at pains to prove that the speech is affected when the disease is in the anterior part of the brain. But this has been disputed in a memoir by Cruveilhier, where he describes several cases in which loss of speech was a prominent symptom, while the disease was not in the anterior part of the brain, but in some other part, as the middle lobes, and even the cerebellum. In one of his cases, a man was seized, in a fit of passion, with palsy of the left side and impaired speech. He recovered after some months, but his speech continued a little embarrassed. After eight years, he was attacked with palsy of the right side, and difficulty of swallowing, and

died in ten days. In the middle lobe of the left hemisphere, there was a coagulum of blood the size of a nut, surrounded by some ramollissement. In the left lobe of the cerebellum, there was a cyst half an inch in diameter, lined by an organized membrane, and containing a small quantity of limpid serum. Another of his cases is sufficiently remarkable: A man, aged 48, was first attacked with loss of speech and twisting of the mouth, which continued. After six months, he was seized with palsy of the right side. He recovered from this, but his speech continued much impaired. After two years more, he had a succession of attacks in which the right leg was first affected, and afterwards the left leg; the embarrassment of his speech was increased in each attack. Finally, at the end of another year, he had a fatal attack, with loss of speech, loss of the power of swallowing, and some vomiting. In the left hemisphere, there were three cysts near the surface. In the right hemisphere, there were two cysts in the corpus striatum, and two in the thalamus. In the substance of the tuber annulare, there was a cavity containing recent blood, not coagulated. In one of Dr. Cheyne's cases, there were three distinct extravasations; one in the substance of each corpus striatum, and one in the third and fourth ventricles. The symptoms were apoplectic with some convulsion, and after some time paraplegia. In another, the extravasation was in the substance of the pons Varolii, from which it had forced its way into the fourth ventricle. The symptoms were severe headach, followed by perfect apoplexy without paralysis. In a case which occurred to a friend of mine, there was a round coagulum, the size of a musket-bullet, in the iter ad quartum ventriculum. The attack consisted of paralysis of the left arm, in a few minutes followed by apoplexy, which was fatal in a few hours. In a singular case described by Mr. Howship, the extravasation was distributed in the substance of the medulla oblongata, in such a manner as to form several thin strata, alternating with strata of the cerebral matter. The case was a sudden attack of perfect apoplexy, which was fatal in two days. A re-

markable case of the same kind is mentioned by Dr. Duncan in his Clinical Reports. Paraplegia is an uncommon occurrence in cases of this class, insomuch that it has been doubted whether it ever arises from an affection of the brain.* Serres has described a case of paraplegia, with palsy of the left arm, connected with extravasation of blood under the right hemisphere of the cerebellum. It occurred also in a case just quoted from Dr. Cheyne, in connexion with extravasation in the third and fourth ventricles. Another is mentioned by Boerhaave, in which it preceded apoplexy, and was connected with extravasated blood under the cerebellum, and about the top of the spine. It does not appear, however, that in any of these cases there was an examination of the spinal canal, so that perhaps we are not entitled to found any conclusion upon them; the subject deserves careful examination.

I conclude this part of the subject with the following case, showing a remarkable feature in this form of the disease, namely, loss of the cerebral substance to a very considerable extent, at the place where the extravasation had been situated.

Case CXXXII.—A gentleman, aged 64, was first seized with an attack of apoplexy in 1824, from which he recovered under the usual treatment, but retained some imperfection of speech, and a degree of weakness of the left side. Some months after, he had a second attack, and in July 1825, a third, accompanied by convulsion, in which he lay in a state of insensibility for 36 hours, and was not able to leave his room for a fortnight. From this time to the period of his death in 1830, he had a succession of apoplectic attacks, amounting in all to twelve. After these attacks, he was generally able to leave his room in a few days, but each left him more and more embarrassed in his speech, and paralytic on the left side, with distortion of the

* See an able and ingenious paper by my friend Dr. Burder, in the Medical and Physical Journal, for June 1827.

mouth, and he died in the 12th attack in 1830, after an illness of eight or ten days; during which, he lay in a state of nearly perfect coma, with total loss of speech and perfect palsy of the left side.

Inspection.—On removing the dura mater, a remarkable depression was found on the surface of the right hemisphere, forming a deep and well-defined cavity. capable of containing from three to four ounces of fluid. It had been filled by a clear serous fluid, which escaped when the dura mater was wounded in opening the head. The surface of the cavity presented nothing different from the ordinary appearance of the cerebral surface, being covered by the pia mater and arachnoid; but the dura mater had been separated by the fluid which had filled the cavity. On cutting into the cerebral substance which formed the cavity, it was found more dense than natural, and a cavity was exposed in the substance of the hemisphere immediately beneath it, presenting the usual appearance of the collapsed cyst which had been the seat of extravasation. It was about an inch and a half in length,—lined by a yellow membrane of the usual appearance, and part of it was obliterated by the adhesion of its opposite surfaces. Several other very small cysts were observed in various parts of the hemisphere, but they were all empty, and no appearance could be discovered capable of accounting for the fatal attack.

§ III.—Of the cases accompanied by ramollissement.

In an early part of this work, I have submitted a conjecture that the ramollissement of the cerebral substance is analogous to gangrene in other parts of the body; and that, like gangrene, it may arise from two very different causes. These are inflammatory action, and failure of circulation depending upon disease of the arterial system. Ramollissement arising from the former cause I conceive to be an affection which holds

a prominent place in the pathology of acute affections of the brain, occurring in early life, and being accompanied by symptoms of an acute character. I have given my reasons for considering this as an affection in many respects distinct from the ramollissement, investigated with such care by the French pathologists, and particularly M. Rostan. This appears to be a disease of the aged,—the cases described by M. Rostan, having chiefly occurred in persons from 70 to 80, and upwards. It is accompanied by symptoms of a paralytic and comatose character, and is frequently complicated with extravasation of blood. I have already alluded to the frequency and the extent of the disease of the arterial system of the brain in advanced life; and there appears to be considerable probability in the conjecture, that this may be the source of the ramollissement in the cases of this class. The disease of the arteries consists of ossification, with thickening and contraction, frequently to a great extent, and sometimes with separation of the inner coat. It corresponds precisely with the state of the arteries, which we know to produce gangrene in other parts of the body, particularly in the toes and feet of old people; and, in another place, I have described a remarkable case, in which separation of the inner coat of the iliac artery produced gangrene of the whole extremity, which was fatal in four days.*

The symptoms accompanying the ramollissement, in this form, do not appear to differ remarkably from those which occur in the other cases of palsy. The attack is frequently preceded by some of the usual symptoms indicating a tendency to disease of the brain; such as, headach, giddiness, partial loss of recollection, and numbness or prickling of some of the limbs. After some time, there occurs suddenly or more gradually a loss of power of one or more limbs, with embarrassment of speech, but without loss of intelligence. The patient is then confined to bed, helpless and oppressed, with more or less of palsy, but with a certain degree of in-

* Edin. Med. Journal, vol. xvi. p. 308.

telligence; and dies after various intervals, either with gradual sinking, or with coma for a few days before death, or sometimes with symptoms of low fever. The symptoms seem frequently to advance more slowly than in the cases from extravasation,—one organ, as the tongue, being first affected, and then one or more limbs after some interval. Pain in the affected limbs is also a frequent occurrence; and rigid contraction of them has been much insisted on, as a symptom characteristic of the ramollissement. It is, however, by no means a uniform symptom, for it is frequently wanting altogether; when it is present in the early period of the disease, it frequently disappears in the course of it; and in some of Rostan's cases, it left the limbs of the paralytic side and affected those of the other. It is also frequently observed in cases entirely of another kind—as in certain states of fever which terminate favourably. Convulsive affections of the limbs are also occasionally met with.

The patient is frequently, in the early stages, quite intelligent, and observant of every thing, although unable to speak, or able to speak but imperfectly. As the disease advances, he frequently becomes more oppressed and somnolent; but he is intelligent when roused, not entirely comatose till the last period, and sometimes never entirely so. In other cases, there is at first a considerable degree of coma, which after the first day goes off, the patient becoming quite intelligent, and giving appearances of recovery, which are found to be fallacious. The sensibility of the affected limbs is in some cases impaired, in others little affected; and, in some cases, they are found acutely painful. The ramollissement is of various extent. It seems to be most commonly seated in the more external parts of the brain, near the surface, but sometimes is found in more deep-seated parts, particularly in the corpus striatum. A small coagulum of blood is sometimes found involved in the softened part; and sometimes the softening is found to have taken place around the cyst of an old extravasation.

I have not seen much of this form of the ramollissement, in its uncombined state: but it seems to be of very frequent occurrence in the French hospitals. The two following cases are the best examples of it I find among my notes. The second of them perhaps may be considered as having some affinity to the cases of the inflammatory character; and, indeed, some of M. Rostan's own cases afford traces of inflammation.

Case CXXXIII.—A man, aged 58, of a full habit and florid complexion, on the 7th of March 1817, about nine o'clock in the morning, without any previous complaint, was found to have lost his speech. I saw him about half past ten, and found him walking about his room; he had the full use of all his limbs; understood what was said to him, and answered by signs; he could put out his tongue freely, but could not articulate a word. He did not admit that he felt any uneasiness in his head, his pulse was natural and of good strength, and his face flushed. The usual remedies were employed through the day, without producing any change in the symptoms. In the morning of the 8th, he was found to be affected with perfect hemiplegia of the right side; and the tongue, when put out, was turned to the right side; he was still quite intelligent, but made no attempt at speech.

He now lay for a month without any change in the symptoms; he slept well in the night; in the day he was quite intelligent, and answered by signs, but continued entirely speechless. For some time his tongue, when put out, was turned to the right side, but afterwards it became strait. He took his food, and appeared to suffer no pain; the pulse was natural; the right side continued completely paralytic. About the 10th of May, he began to have violent pain in the paralytic limbs, and could not bear to have them moved in the most gentle manner without screaming; nothing was to be seen about the limbs that accounted for the uneasiness. For about a fortnight he now suffered constant pain; his strength sunk, and he lost his appetite. He then

had some vomiting, but not urgent; his pulse became feeble, and his features collapsed; and he died in the end of May, of gradual sinking, without coma. There had been no recovery of speech, or of the motion of the right side.

Inspection.—On opening the head, there appeared a remarkable depression on the upper part of the left hemisphere of the brain, about two inches in length and somewhat less in breadth, the dura mater sinking into it to the depth of about half an inch. On removing the dura mater, the substance of the brain at this place was to a great extent broken down, soft and pulpy; and this appearance extended along nearly the whole upper part of the left hemisphere. Tracing this mass backwards, it was found to be terminated by a coagulum of blood, not larger than a small bean. The coagulum was soft like recent blood, and was situated about two inches from the posterior surface of the hemisphere, nearly on a level with the horizontal part of the lateral ventricle. There was no effusion in the ventricle.

CASE CXXXIV.—A man, aged 60, of rather a slender and feeble habit, had complained for nearly two months, of frequent pain in the right side of the head, and an occasional feeling of numbness in the left arm. In the end of September, 1818, this pain rather increased; he had twisting of his mouth, dimness of vision of the left eye, and slight numbness of the left hand. After bleeding and the other usual remedies, he was much relieved, and returned to his usual employment. About a week after this, he was suddenly seized with palsy of the left side, and inarticulate speech; his mind was distinct; he seemed to have some headach, but not severe; his mouth was drawn to the left side. The usual remedies were employed without relief. He continued in the most helpless state of paralysis, being unable to turn from off his back, but quite distinct, and able to express all his feelings: pulse natural. In this state he lived a month without any change of the symp-

toms, except that about a week before his death he was able to move the paralytic leg a little; this slight degree of motion continued three or four days, and then ceased. Two days before his death he was suddenly seized with perfect loss of speech; and this was followed in a few hours by coma, from which he did not recover.

Inspection.—The pia mater on the upper part of both hemispheres appeared thickened, and was remarkably vascular. Both lateral ventricles were distended with fluid. The substance of the brain was healthy, except on the outer part of the right hemisphere, where there was a considerable portion in a state of complete ramollissement. There was considerable effusion under the arachnoid membrane.

§ IV.—Paralysis from inflammation, and its consequences.

This part of the subject it is only necessary to refer to very briefly in this place, in connexion with the general arrangement of the sources of paralysis. It has been already considered at some length in a former part of this essay, particularly in connexion with inflammation of the cerebral substance. We have there seen paralysis, which had come on with the same rapidity as in the cases considered under the present section, connected with simple inflammation of the substance of the brain,—with this inflammation passing into ramollissement,—and with the encysted abscess. We have likewise seen it coming on in a more gradual manner, in connexion with a very low inflammatory action in the cerebral substance, which seems to terminate by induration of the affected part. I shall in this place only add the following example of this modification of the disease.

Case CXXXV.—A gentleman, aged about 60, whom I saw along with Mr. William Brown, had been for four years affected with paralysis of the right side, and

indistinctness of speech. Without any increase of these symptoms he died gradually exhausted by dyspnœa and general dropsy, connected with disease of the heart.

Inspection.—In the anterior part of the left hemisphere, we found a portion of the cerebral substance the size of a large walnut, very much changed in its appearance, being of a brownish-yellow colour; this portion was likewise much firmer than the healthy cerebral substance, except at its lower part, where it was soft and approaching to suppuration.

It is chiefly when the patient dies of some other disease, that we find this affection in the state of simple induration; when it becomes itself the fatal disease, it is generally by passing on to partial suppuration or ramollissement. Examples of this kind have been formerly referred to.

In regard to the paralytic state in general, there are several important circumstances which may be referred to very briefly. In some cases of palsy there is loss of motion without loss of feeling; in others, the feeling is lost also. But some singular cases are on record in which loss of feeling took place without loss of motion. Several examples of this are described in the Memoirs of the Royal Academy of Sciences. The most remarkable is the case of a soldier, a very strong man, and able for all his duties, who had so completely lost the feeling of his right arm and leg, that he allowed the parts to be cut, or red hot irons applied to them, without complaining of any pain. A gentleman mentioned in the same paper had a similar peculiarity in his right arm.* Some interesting examples of the same kind are described by Mr. Broughton in the Medical and Physical Journal for 1827. In a case which is related in the Ephemer. Naturæ Curios., there was loss of motion on the one side, and loss of feeling without any diminution of motion on the other.† A gentleman who was under the care of Dr. Hay of

* Mem. de l'Acad. Royale des Sciences, anno 1748.

† Eph. Naturæ Curios. Cent. II. Obs. 196.

Edinburgh, had two paralytic attacks at the distance of eight months from each other. In the first there was perfect loss of feeling, with only partial loss of motion; in the second there was perfect loss of motion, with only partial loss of feeling. He recovered perfectly from the first attack after a short time; but, after the second, though he recovered partially, he continued to drag his leg, and after a year or more died of apoplexy. It is unnecessary to refer the scientific reader to the light which has been thrown on this curious subject by the discoveries of Sir Charles Bell.

In cases in which there has been loss both of feeling and motion, we frequently observe recovery of feeling, without recovery of motion. Berdotus, on the other hand, describes a case in which there was recovery of motion without recovery of feeling;* a similar case is related by Burserius.† Increased acuteness of feeling in paralytic limbs has also been observed; and I have referred to a case, in which, connected with disease in the brain, there was such an increased sensibility of the arm, that the least breath of cold air excited convulsion. Dr. Falconer, in the Mem. of the Med. Society of London, vol. ii., mentions a gentleman, who, after a paralytic attack, had such a morbid state of sensation, that cold bodies felt to him as if they were intensely hot. When he first put on his shoes, he felt them very hot, and as they gradually acquired the temperature of his feet, they appeared to him to cool. Paralytic limbs sometimes become intensely painful without any obvious cause; examples of this have been given, and a case has also been referred to, in which recovery from palsy was accompanied by such pain, that the limb remained useless. When paralytic limbs are recovering, the recovery sometimes begins at the extreme parts of the limb, as the fingers and toes, and extends gradually upwards; and sometimes it begins in the part next the body, and extends gradually to the extreme parts. The same variety occurs in the first attack of paralysis, when

* Act. Helvet. tom. vi. p. 191.

† Institut. Medicin. Pract. vol. iii. p. 76.

it takes place so slowly as to enable us to observe its progress. It seems in general to begin in the more extreme parts, but I have seen one patient who could write distinctly with his arm supported upon a table after the arm from the shoulder to the elbow was completely paralytic; in a few hours after the hand was paralytic also. M. Velpeau has described the case of a soldier in the hospital of Tours, who had complete palsy of the right arm from the shoulder to the middle of the fore-arm, while the hand was not in the least affected. He recovered in three months.*

In regard to the temperature of paralytic limbs, I think it is generally supposed, that they are colder than the healthy limbs; but this does not appear to be the case. The truth seems to be, that they have lost in some degree that remarkable power, possessed by the living body in a healthy state, of preserving a medium temperature; and that, according to the temperature to which they have been exposed, paralytic parts become hotter or colder than sound parts, which have been exposed to the same temperature. A Case has been related to me by a friend, in which a medical man paying a visit to a paralytic patient, found the paralytic arm so intensely hot that it was painful to touch it. This, upon inquiry, was found to be owing to the application of very hot bran, which the patient had made to the arm by the advice of a neighbour, though he was himself insensible of the change of temperature.

Some interesting phenomena are presented by the conditions of the mental faculties, connected with paralytic affections, or which remain after recovery from the apoplectic. One of the most common is a loss of the memory of words, and this has sometimes been observed to be confined to words of a particular class, as nouns, verbs, or adjectives. The patient is frequently observed to have a distinct idea of things and their relations, as well as of persons, while he is entirely unable to give them names, or to understand them when they are

* Archives Generales, January 1825.

named to him. A singular modification of this condition has been related to me. The gentleman to whom it referred could not be made to understand the name of an object when it was spoken to him, but if the name was written he comprehended it immediately. Another frequent modification of the affection consists in putting one word, or one name of an object in the place of another; and a very singular circumstance in some cases of this kind is, that the patient always applies the names in the same manner, so that those who are constantly with him come to understand exactly what he means. In one case of this kind, a gentleman who was in other respects pretty well recovered, when he wanted coals put upon his fire, always called for paper, and when he wanted paper, he called for coals, and these names he always used in the same sense. In other cases the patient seems to invent names, being words which to a stranger are quite unintelligible, but he always uses them in the same sense, and his regular attendants come to know what he means by them.

In the general pathology of paralysis there is much obscurity. We find it connected with a great variety of morbid conditions of the brain, and on the other hand we find all these existing without producing it. We cannot attempt to explain these difficulties, and must content ourselves with a simple view of the facts as they stand in the present state of our knowledge. We have found paralysis connected with the following variety of morbid appearances.

I. Simple and recent inflammation of the cerebral substance.

II. This inflammation passing into ramollissement.

III. The encysted abscess of the brain.

IV. Induration of a portion of the cerebral substance.

V. Extravasated blood in the ventricles; on the surface of the brain; and in cavities or cysts in the substance of the brain.

VI. The empty cysts from which extravasation has been absorbed.

VII. Serous effusion on the surface of the brain.

VIII. Extensive disease of the arteries of the brain.

To this enumeration we have also to add the following points which have not arisen so directly out of the preceding observations.

IX. Morbid changes in small portions of the cerebral substance. Several years ago I attended a gentleman who was affected with very slight palsy of the right side, which continued for eight or ten months without becoming either better or worse; he was pale and of a very spare habit, and had made very little complaint of his head. He at last died comatose, after a few days illness. The only morbid appearance was a portion of the left hemisphere, at the very lower part of the middle lobe, which was altered in its texture so as to have very much the appearance of fungus hæmatodes. The part so diseased was about the size of a large walnut. Several cases are described by Andral under the name of cancer of the brain, in which small portions were found in a state of disease resembling this. The symptoms in general were long-continued pain, referred to one part of the head, with paralytic symptoms.

X. Loss of a considerable portion of the cerebral substance. One of the most remarkable examples of this on record is a man mentioned by Mr. O'Halloran, who, after an injury of the head, lost a great part of the frontal bone on the right side. The bone had been completely broken to pieces; some of the pieces were extracted immediately after the injury, and others were discharged after a day or two. A great opening was thus formed, and extensive suppuration having taken place, there were discharged through it at each dressing immense quantities of purulent matter, mixed with large pieces of the cerebral substance, making, after some time, "a frightful cavern" in the very substance of the brain. On the 8th day of this affection the left hand and arm became paralytic, and the left thigh and leg on the 10th day. The man lived to the 17th, re-

taining his faculties to the last, and having been through the whole course of the disease perfeetly composed and intelligent, and his pulse quite natural. No account is given of the dissection, or of the actual loss of the cerebral matter; but the report shows that it must have been very great. On the 8th day Mr. O'Halloran remarks,—" the sore continued to discharge greatly, insomuch, that when I affirm that not less than three ounces of the brain, with a horrid smell, followed every dressing, I am certain that I am a good deal under the quantity;"—and, again, on the 13th day,—" the cavern was terrible, and I feared that the remains of the lobes of the right side of the brain would follow."—In the conclusion of this remarkable case, it is added that the man " preserved his intellect to the very moment of dissolution."*

XI. Cold. A man mentioned by Dr. Clark, became paralytic in both legs, and partially in the arms, in consequence of being much benumbed with cold in travelling on the top of a coach; he derived benefit from mercury and warm bath, and was nearly recovered in eight or ten months.† I have seen a case of paraplegia which was referred to this cause, and which, when I saw it last, had continued for about four years with very little improvement. Dr. Powel has described three cases of paralysis of one side of the face, producing great twisting of the mouth, and in one of them, inability to shut the eyelids. The affection came on immediately after exposure to cold, by a cold wind blowing upon one side of the face; it was not accompanied by any other symptom; two of them were well in eight or ten days; but the third, a child, was not free from the complaint for three months. They seemed to derive benefit from sudorifics and the application of steam. This was probably an affection of the portio dura.‡

XII. Local affections of nerves. For the facts con-

* O'Halloran on Injuries of the Head, p. 103.
† Edinburgh Medical Journal; vol. iv. p. 266.
‡ Transactions of the College of Physicians, London, vol. v.

nected with this curious subject, I refer to the beautiful investigations of Sir Charles Bell. One of the most common examples is paralysis of one side of the face from an affection of the portio dura. I have seen several examples of it; in some of them it has been a transient affection, and apparently connected with some inflammatory action about the external ear or the parotid gland; and it has yielded readily to topical bleeding and blistering. In other cases it is connected with disease of the bone, and proves most untractable. The temporary paralysis which arises from accidental pressure upon a nerve is familiar to every one; but singular cases occasionally occur in which the effects are more permanent. An instance of this kind has been related to me in which the paralysis did not go off for several months, and another in which it was permanent. In the latter case, it took place in the fore-arms and hands of both sides, and was induced by pressure in consequence of leaning for a long time upon a bar of wood while the person was stooping forward in his anxiety to witness some public exhibition. Mr. Brodie has described a case of paralysis of one side of the face which followed a blow on the cheek, and recovered in three months.

XIII. There is a modification of paralysis which seems to be connected with the state of the circulation in the affected part. A lady, mentioned by Dr. Storer,* was recovering from a pneumonic attack, when one morning, after a restless night, she was suddenly seized with an acute pain in the left shoulder, extending to the arm, and at the same time the whole left side became paralytic. The leg retained an obscure degree of motion and feeling, but the hand and foot were insensible to the prick of a needle. The parts were cold, and all the arteries in them were without pulsation. On the right side of the body, the pulse was of good strength, and a little frequent. After a few hours the pain shifted to

* Trans. of a Society for the Improvement of Medical and Surgical Knowledge, vol. iii.

the leg and foot; and she had also some obscure pain in the forehead, which was removed by bleeding with leeches. The pain of the leg and foot abated after twelve hours, and she had then no complaint except the paralysis. For several days she seemed to be improving a little in the motion of the parts, but they continued cold and without pulse; on the fifth day, she had an uneasy feeling in the epigastrium, with sense of suffocation; her breathing became short and hurried, and she died in the night; the body was not examined. A gentleman, mentioned in the same paper, was seized with paralysis of the right arm as he sat at breakfast, having been previously in perfect health. He did not complain of any pain, but the arm was pale, and every part of it without pulse; in the left arm the pulse was natural. After four hours he became faint, with quick and laborious breathing, and frequent pulse; and, in two hours more, he died. The body was not examined. In the same journal, Dr. Wells has described the case of a gentleman, subject to cough and dyspnœa, who awoke one morning with a severe pain in the left arm; in the afternoon it became benumbed and paralytic. The pain then ceased, and the arm was found to be without pulse. He continued in this state for two days without any other complaint; and, on the third day, he died suddenly, as he got up to go to stool. The paralytic arm only was examined after death, and in it no morbid appearance could be detected.

This singular affection was probably connected with extensive disease of the arterial system. Some years ago, I saw a woman, aged 73, who was suddenly seized with violent pain of the whole right arm, accompanied by palpitation of the heart, inclination to vomit, and pain extending across the thorax from the breast to the back; the pulse of the affected arm was extremely weak; in the other arm it was 120 and strong, but irregular. After a day or two the pain ceased, leaving the arm without pulse, and very weak, but not completely paralytic. After ten days, the right thigh, and leg were affected in the same manner; after five days

more, the left arm, and ten days after this, the left thigh and leg went through the same course. She was then confined to bed in a state of extreme weakness, and no pulsation could be felt in any artery except the carotids, and a little in the right humeral; in the carotids it was strong and frequent. The radial artery felt under the finger like a firm cord, as if permanently distended with blood. She still had pain in the region of the heart, which at times was very severe, impeding respiration, and preventing her from lying on the left side. She lived a month in this state; the dyspnœa and palpitation became gradually more and more severe; and she died gradually exhausted, two months after the commencement of the disease. Some days before death, slight pulsation was perceived in the arteries of the left arm, and in the right it was more distinct than formerly. On inspection much fluid was found in the pericardium, and in the right cavity of the pleura. The heart was flaccid, and none of its cavities contained any blood; in the right sinus venosus, there were two firm fleshy tumors or polypi; the one the size of a pigeon's egg, attached to the side of the sinus by a slender pedicle, the other smaller and attached more extensively. The whole arterial system was extensively ossified; in some places the diameter of the artery was considerably diminished by the ossification, and several of the great arteries were completely obstructed by firm coagula of blood in the contracted parts. This was most remarkable in the right common iliac, which was filled through nearly the whole extent of the common trunk, by a dark-coloured coagulum, which was firm, elastic, and dry. The left subclavian was also much diseased and considerably contracted, and the aorta near the bifurcation was for about two inches almost entirely ossified.

There are other singular facts which seem to indicate peculiarities in the circulation in particular parts of the body, probably originating in the obscure relation betwixt the vascular and nervous systems. An esteemed medical friend of mine, now no more, when heated by exercise, perspired very freely on one-half of his body

and not on the other, the line being drawn with great precision from the forehead along the ridge of the nose, and so downwards. When he was very much heated, the other side perspired also, but this only occurred occasionally from great exertions; the singular perspiration of the one side was a matter of almost daily observation. I knew another gentleman who had the same peculiarity, after being affected with complaints in the head, which had threatened a paralytic attack. Sir Everard Home has mentioned a man who had palsy of the lower extremities from a wound of the spinal cord; there was free perspiration of all the parts above the seat of the injury, but none below it. The same peculiarity occurred in a remarkable manner in a case of disease of the spinal cord to be afterwards described. A child mentioned by Dr. Falconer became pale and emaciated on the whole left side of the body, without any diminution of muscular power, the right side remaining healthy; she recovered by the use of warm pumping.*

The various forms of comatose affections which have been described by systematic writers, seem to be merely varieties in degree, or modifications of the disease, of little practical importance; but some of these conditions are deserving of attention. The state of lethargy, for example, presents some interesting phenomena, in regard to the extent in which it may exist without passing into apoplexy, and without permanently injuring the functions of the brain, though they are for the time completely overpowered and suspended. A man mentioned by Mr. John Bell, who had been accustomed to a life of much activity, was confined from his usual employment by an extensive fistula which he had concealed. Being of a full habit, and his appetite unimpaired, he soon sunk into a state of complete lethargy, nearly his whole time being spent in sleep. When roused, he attempted to answer questions, but his answers were incoherent, and his speech inarticulate; he had been a

* Mem. Med. Soc. of Lond. vol. ii.

long time in this condition when Mr. Bell saw him. His fistula being cured, he recovered gradually by evacuations, blistering on the head, and a proper regulation of his diet, so that in a few weeks he was well, returned to his former employments, and managed with correctness the affairs of a company.* Hippocrates mentions a priest, subject to annual fits of gout, in whom the paroxysm terminated regularly for several years in a state of lethargy, from which he could only be roused to take food or drink. It was accompanied by tremors, stupor, and forgetfulness, immobility of the eyes, and a completely enervated state of the whole body; it generally continued one or two weeks. A man mentioned by Willis, at the crisis of a putrid fever, lay for four days in a state of profound sleep, from which nothing could rouse him. He then came out of it after blistering, but his faculties were gone, so that he knew nobody, remembered nothing, and understood nothing, "*vix supra brutum saperet.*" He continued in this state for two months, and then gradually recovered. Some years ago I saw a young man, who at the end of a tedious fever fell into such a degree of stupor that I apprehended effusion in the brain. He recovered, however, after a good many days, and his bodily health was soon restored, but his mind was in a state approaching to idiotism. In this condition he was taken to the country, and recovered gradually after several months. A most remarkable case of this kind is related by Dr. Pritchard, on the authority of the late Dr. Rush of Philadelphia. The patient was an American student, and a person of considerable acquirements, who on his recovery from fever, was found to have lost all his acquired knowledge. On recovering his health, he began to apply to the Latin Grammar; had passed through the elementary parts, and was beginning to construe, when one day, in making a strong effort to recollect a part of his lesson, the whole of his lost impressions suddenly returned to his mind, and he found himself at once in possession of all the acquirements that he possessed before his illness.

* Bell's Principles of Surgery, vol. ii.

A state of the mental faculties somewhat analogous occasionally occurs in diseases of simple exhaustion. Many years ago, I attended a lady, who, from a severe and neglected diarrhœa, was reduced to a state of great weakness, with remarkable failure of her memory. She had lost the recollection of a particular period, of about ten or twelve years. She had formerly lived in another city, and the period of which she had lost the recollection was that during which she had lived in Edinburgh. Her ideas were consistent with each other, but they referred to things as they stood before her removal. She recovered her health after a considerable time, but remained in a state of imbecility resembling the dotage of old age.

The state of the brain in such cases as these differs from apoplexy, but is nearly allied to it; for a similar condition of the mental faculties sometimes occurs as a prelude to apoplexy, or it may be left as a consequence of it, after every other symptom has been removed. A gentleman mentioned by Wepfer was seized with hemiplegia of the right side and profound sleep; in the second day, the right side was convulsed, and after this the palsy disappeared. He then lay in a state of sleep for nine days, having during seven of these been incapable of taking any food. On the 8th day he began to take what was offered him, and on the 9th he came out of the state of stupor, but his faculties were gone; he knew nobody, and neither remembered nor attended to any thing. After several weeks he began to know his more particular friends, then began to remember words, to repeat the Lord's prayer, and to read a few words of Latin, rather than German, which was his own language, but only a few words at a time. If he was urged to read more, he said that he formerly understood these things, but now did not. He could write, however, and frequently wrote lines both of German and Latin words, in elegant characters, but without meaning. After some time he began to pay more attention to what was passing around him, and to look after his household affairs. He often lamented his want of understanding, and expressed

his hope that he should recover it. While thus making slight and gradual progress, he was after three or four months cut off by an attack of apoplexy.

SECTION IV.

OUTLINE OF THE TREATMENT OF APOPLEXY.

From the facts which have been related, we have seen reason to believe, that there is a modification of apoplexy which is fatal without leaving any morbid appearance, and which probably depends upon a deranged condition of the circulation in the brain; we have also seen grounds for believing, that the cases which terminate by effusion are probably at their commencement in this state of simple apoplexy. We have seen farther, that we have no certain mark by which we can ascertain the presence of effusion; and finally we have found, that even extensive extravasation of blood in the brain may be entirely recovered from by the absorption of the coagulum. These considerations give the strongest encouragement to treat the disease in the most active and persevering manner. They teach us, also, not to be influenced in our practice, by the hypothetical distinction of apoplexy into sanguineous and serous; and, finally, not to be hasty in concluding in any particular case, that the disease has passed into a state in which it is no longer the object of active treatment.

In the treatment of apoplexy, our remedies are few and simple. Those in which our chief reliance is to be placed are, large and repeated bloodletting, active purgatives, and cold applications to the head, aided by an elevated position of the body, cool air, and the absence of all stimuli. Antimonials may occasionally be useful as an auxiliary, from their known effect in restraining

vascular action, provided in the early stages they do not occasion vomiting.

Our first great object is to take off the impulse of blood from the arteries of the head by bleeding carried to such an extent as shall powerfully and decidedly affect the system, and by repeating it at short intervals as soon as these effects begin to subside. The first bleeding should probably be from the arm, but, after this, there seems to be an evident advantage in abstracting blood locally either from the temporal artery or by cupping. Much importance has been attached by some to bleeding from the jugular vein, as most likely to give immediate relief to the head; but we must remember, that the only jugular vein that can be opened is the external jugular, which has very little communication with the brain, and consequently that bleeding from it is probably much inferior to bleeding from the temporal artery. As soon as possible after the bleeding, means are to be taken for inducing strong purging. The most efficient remedy by far for this purpose is the croton oil, and, if the patient cannot swallow, it may be very conveniently introduced into the stomach, suspended in thick gruel or mucilage, through an elastic gum tube; the operation should be expedited by strong purgative injections. This is always to be considered as a most important and leading point in the treatment of apoplexy; and though, in arresting the progress of the disease, our first reliance is upon large and repeated bleeding, the first decided improvement of the patient is generally under the influence of powerful purging. The effectual application of cold to the head is the third remedy on which we rely, and it is equally applicable to the different states of the disease, whether arising from simple apoplexy or from extravasation. It may be applied either by means of iced water, or pounded ice in a bladder; or by a full stream of cold water directed against the crown of the head, and received in a basin held under the chin, while the patient is supported in a sitting posture. I have formerly given an example of a patient restored in a few

minutes or rather seconds by this remedy from a state of perfect apoplexy.

The active use of these remedies is sometimes followed by a very speedy removal of the apoplectic state. In other cases, though little immediate effect may be produced, yet by a persevering repetition of them, the coma begins to subside after some time, perhaps a good many hours, or even several days. In other cases again, they may be used in the most active manner without relieving the patient, and after all we may find upon dissection, that the disease was still in the state of simple apoplexy. This important fact cannot be too often repeated or too carefully kept in mind; and it should lead us to prosecute the treatment of every case of apoplexy with the utmost vigour and perseverance. In one case that occurred to me, the bleeding was repeated to the extent of upwards of one hundred ounces, assisted by purging from the croton oil, repeated to the extent of above twenty drops, and the case terminated favourably, after the symptoms had continued in a very doubtful state for three or four days.

In the extent of our evacuations indeed, a due regard is certainly to be had to the age and constitution of the patient, and the strength of the pulse; but I think we have sufficient ground for saying, that there are no symptoms which characterize a distinct class of apoplectic affections, requiring any important distinction in the treatment; or in other words, a class, which in their nature do not admit of bloodletting. On this important point, we may refer with some confidence to the facts which have been related. Weakness of the pulse, and paleness of the countenance, we have seen to be frequent symptoms of the worst form of sanguineous apoplexy; and, on the other hand, we have seen cases terminate by serous effusion, which were accompanied by strong pulse and flushing of the countenance. Finally, we have seen one remarkable case in which there existed every circumstance that could lead us to consider the disease as serous apoplexy, but which was

fatal without any effusion; and another in which there was most extensive effusion without any apoplectic symptom. It is likewise to be kept in mind, that in apoplectic affections the strength of the pulse is a very uncertain guide, for nothing is more common than to find it upon the first attack of apoplexy, weak, languid, and compressible, and becoming strong and full after the brain has become in some degree relieved by large blood-letting.

It would be quite superfluous to detail common apoplectic cases treated successfully upon these principles. But it may be of use, in connexion with this part of the subject, to select a few cases, which, occurring in old and infirm people, might have been considered either examples of serous apoplexy, or modifications of the disease not admitting of active treatment, yet under such treatment terminating favourably.

Case CXXXVI.—A woman, aged 70, of a spare habit, and thin and withered aspect, having walked out in her usual health, fell down in the street, speechless and paralytic on the right side. I saw her four or five hours after the attack. She was then much oppressed, but not entirely comatose. She was completely speechless and paralytic; her pulse about 96, and of tolerable strength. She was bled to 15 ounces; purgative medicine was ordered, with cold applications to her head. On the following day she was considerably improved both in speech and in the motion of the right side; but, having become rather worse towards night, she was again largely bled, and purgative medicine was continued. From this time she improved rapidly. At the end of a week she was able to walk with little assistance, and in a few days more was restored to perfect health.

Case CXXXVII.—A gentleman, aged 70, of a spare and feeble habit, and very infirm from frequent attacks of asthma, without any warning fell from his chair on the floor in a state of perfect apoplexy, accom-

panied by violent convulsion. When I saw him, an hour after the attack, he was still in a state of perfect coma; the convulsion had recurred at short intervals, and had affected chiefly his arms and his face. His face was pale; his pulse was of good strength and a little frequent. He was largely bled from the arm; and an active purgative was given, assisted by a purgative enema, and cold was applied to his head. The convulsions continued for some time to recur with great violence; they then became less severe, and at length ceased about three hours after the attack, leaving him in a state of coma. But the purgative having soon after operated freely, he recovered his recollection. Next day, he complained of headach, and took more purgative medicine; and after a few days more he was in his usual health.

Case CXXXVIII.—A lady, aged 82, on the morning of Sunday, 8th March, 1818, complained of headach, but went to church. While in church she lost her recollection, talked incoherently, and was brought home with difficulty, being unable to stand. She was still incoherent and partly comatose; and when put to bed was seized with violent convulsion, which affected chiefly her face and the left side of her body. The convulsions recurred frequently, leaving her in the intervals in a state of profound coma, and the left side appeared to be paralytic. The pulse was of good strength, and a little frequent. She was bled to 20 ounces; cold was applied to her head, and an active purgative was given as soon as she could swallow. On the following day there was little change; more purgative medicine was given. On the 10th the coma was diminished, but it was succeeded by much unmanageable restlessness with incoherence and some convulsion; pulse 112. More purgative medicine was given; and small doses of the tartrate of antimony seemed to be very beneficial. On the 11th there was little change, but on the 12th she was much improved—began to know her friends, and her pulse was coming down. In

a few days more she was in her usual health, and lived for several years. This lady had also suffered an apoplectic attack in 1814.

Case CXXXIX.—A man, aged 70, tall and of a spare habit, and rather infirm—10th April, 1815—lost his recollection; walked unsteadily without knowing whither he was going, and could not be made to comprehend that he was ill. He was put to bed, but insisted upon getting up again, staggered a few steps, and then fell down on the floor in perfect apoplexy. I saw him about an hour after the attack, when he was still in a state of profound coma; his pulse a little frequent and of good strength. Being bled to 25 ounces, he became sensible, and took purgative medicine; and his head was shaved and blistered. After three hours he relapsed into coma. He was then bled again to 15 ounces without any immediate relief, but, the purgative having soon after begun to operate briskly, he was gradually relieved: and in a few days was free from complaint.

By bloodletting and the other evacuations, we cannot perhaps properly be said to cure apoplexy; we only relieve the vessels of the brain from the impulse of the general circulation, and thus take off one principal impediment to the recovery, which consists in the vessels resuming their healthy relations after this impediment is removed. But we have every reason to believe, that these evacuations may be carried as far as they can with propriety, and yet that the vessels may not recover their healthy action. Having therefore pushed these evacuations as far as we consider safe or expedient without relieving the patient, our next object is to inquire, what other means we have in our power which may contribute to his relief under these circumstances. Blistering and other external stimulants may perhaps have some effect, and I think I have seen decided benefit from strong friction of the body, but these remedies are perhaps not much to be relied on. There are however two

remedies, which have been at different times strongly contended for in the treatment of apoplexy, and which may come under consideration, at that period or in that condition of the disease which I have now referred to: these are, emetics and internal stimulants. The use of emetics in apoplexy is as old as the days of Aretæus, and they have been employed at different times by physicians of the first eminence, among whom may be mentioned, Etmuller, Sydenham, Boerhaave, and Lieutaud; and the practice must therefore have some foundation in observation and experience. There can be little doubt that in the early stage of any apoplectic affection, the use of an emetic would be a very hazardous practice, and, at any period of apoplexy with extravasation of blood, it probably would be injurious; but in simple apoplexy, after the system has been reduced by repeated evacuations as far as seems expedient, and yet the coma has not been removed, it seems very probable that the action of a mild emetic might be beneficial. The delicacy of the practice, however, consists in the difficulty of distinguishing simple apoplexy from apoplexy with extravasation of blood. Nearly the same observations apply to the use of internal stimulants. We must make an important distinction betwixt the action of stimulants in a vigorous and plethoric state of the system, and their action when the system has been reduced by large and repeated evacuations; and I think there are conditions of apoplexy in which stimulants may be used with safety and advantage.

The observations which have now been made, in regard to apoplexy, apply equally to the earlier stages of paralysis. In regard to the more advanced cases, after the immediate effects of the attack have been removed, there are some very interesting points of investigation. Perhaps we have been too much in the habit of believing that paralysis of any considerable standing depends upon a fixed and irremediable disease of the brain. Many cases are on record which tend to shake this opinion. We see recent cases of it completely carried off in a few days; we see others recover more gradually,

so that, in a few weeks or months, there is no trace of the disease; and in many cases, in which, after long-continued palsy, the patient has died of some other affection, we find no morbid appearance in the brain, or none adequate to account for the disease. We may add to these facts many singular examples of very sudden recovery from palsy even in cases of long standing. A man mentioned by Dr. Russel,* after an apoplectic attack with hemiplegia, recovered the use of his arm in six weeks, but the lower extremity remained perfectly paralytic. After twelve months, in which he made no improvement, he was one day astonished to find that he had some degree of motion of the leg, but it continued only a few minutes. On the same evening he had headach, and in the night he was seized with a sort of fit, in which the paralytic limb was strongly convulsed, and after this he had slight power of moving it. The fit returned next day, and again in the night, and then left him completely free from paralysis, and in perfect health; he had continued well for eight years at the time when the account was written. A case somewhat similar, though of shorter standing, occurred to a friend of mine. A middle-aged man was suddenly attacked with hemiplegia and loss of speech, while he was using violent exercise in walking quick or running; all the usual practice was employed without any improvement for a month; the paralytic limbs then became one day suddenly convulsed, and when this subsided the paralysis was gone. In a woman, mentioned by Dr. Home, hemiplegia of considerable standing was removed by an attack of fever.†

A man whose case is mentioned by Mr. Squire,‡ had been liable to convulsions from his childhood till he was twenty-three years of age. The fits then left him, and he enjoyed good health for three years; when, without any previous complaint, except a cold, he suddenly

* London Med. Observ. and Enq. vol. i.
† Home's Clinical Experiments.
‡ Philosophical Transactions, vol. xlv.

lost his speech. He had no other paralytic symptom, and was otherwise in good health, but continued perfectly speechless for four years. He was in general a man of temperate habits, but having at this time been one evening much intoxicated, he fell from his horse three or four times on his return home, and was at last taken into a house near the road and put to bed. He soon fell asleep, and had a frightful dream, during which, struggling with all his might to call out for help, he did call out, and from that time recovered his speech perfectly. A young woman mentioned by Dr. Watson* had been long liable to severe convulsions, the attacks of which were frequently followed by temporary paralysis of those muscles which had been most severely affected. After one attack she lost her sight entirely for five days. At length, after one of the fits, she lost her speech, and recovered it after a short time; but the convulsion returning soon after, was again followed by loss of speech, and she continued entirely speechless for fourteen months. During this interval she had no return of the convulsion, and was otherwise in good health. Having one evening violently heated herself by dancing for four hours, she recovered her speech, and from that time continued free from complaint. Several cases still more remarkable are related by Diemerbroeck. A woman who had been paralytic from the age of six to forty-four, suddenly recovered the perfect use of her limbs, when she was very much terrified during a severe thunder-storm, and was making violent efforts to escape from a chamber in which she had been left alone. A man, who had been many years paralytic, recovered in the same manner when his house was on fire; and another, who had been ill for six years, recovered suddenly in a violent paroxysm of anger.

A remarkable case has been communicated to me of a gentleman, who, after an apoplectic attack lost his

* Philosophical Transactions, vol. i.
† Observat. et Curationes Medicæ. Obs. x.

sight, and continued in a state of perfect blindness for about seven years. After that time, while he was one day out in his carriage, he suddenly recovered his sight; and it was found that he had entirely retained his skill in drawing, for which he had been distinguished before the attack.

These examples point out a most important principle in regard to paralysis, namely, that cases of it, even of long standing, sometimes depend upon a cause which is capable of being removed entirely, and removed almost in an instant; and they direct our attention to a most interesting subject of research in regard to a class of affections, which of all diseases are usually considered as the most hopeless.

The restoration of paralytic limbs, after the first urgency of the attack has been removed, is in many cases entirely a work of nature, and seems, in the most common description of cases, to depend upon the gradual absorption of the coagulum. In the treatment of cases of a more protracted kind, various remedies have been employed, chiefly of a stimulating nature, both external and internal. To the former class belong warm baths, friction, electricity, and galvanism; to the latter, mustard, ammonia, camphor, and nearly the whole class of stimulants. All the remedies of this class, however, must be used with a considerable degree of caution; perhaps the use of them may be more safe, and may be carried on with a greater degree of activity, if the general system, at the same time, be kept in a very low state by spare living and occasional evacuations. This, I imagine, is always to be considered as an essential part of the treatment, and I cannot agree with some most respectable writers, who hold that the diet in paralytic cases ought to be nourishing and restorative. With this precaution, I think it probable, that there are many cases of paralysis in which stimulants may be employed with much benefit. I cannot say what remedies of this class are to be preferred. Some have strongly recommended the tincture of Cantharides, others have em-

ployed the balsams, turpentine, mustard, arnica montana, guaiacum, seneka, and various others; also several articles of a narcotic quality, as the *Rhus toxicodendron, Aconitum napellus*, &c. In Germany, phosphorus is said to have been given internally with advantage; and the favourite remedy lately has been the strichnia. It is apt to occasion convulsion, and the first proposal of the use of it as a remedy, is said to have been founded on the observation, that when paralytic limbs become convulsed, they frequently soon after recover their power. In the most favourable examples, however, that have been given of its efficacy, a long time was required for the recovery; and as we know that a considerable proportion of paralytic limbs recover spontaneously, we must receive very cautiously the statements in regard to the efficacy of any particular remedy. M. Gendrin states, that he has had extensive experience in the use of the strichnia, in all its forms, and the result of his observation is certainly not encouraging. In all his cases it exercised an immediate and powerful influence,—producing a sense of heat and formication in the limbs, and spasmodic contractions, which were, in some cases, general, in others confined to the paralytic limbs. These effects were continued for weeks, and, in most of the cases, were repeated several times, but no diminution of the palsy was observed in any of them. Emetics have been recommended; also iodine and mercury pushed to salivation. Mr. Wardrop has described a singular case of eighteen months standing, which seemed to derive benefit from tickling the parts with a feather; it recovered in two months. M. Gross mentions a cure by stinging with nettles; and Celsus seems to have employed a similar practice. In the treatment of paralytic limbs, however, we can expect to do nothing, unless the cause be removed; and their recovery, after the cause has been removed, is chiefly to be regarded as the work of nature. As auxiliaries, it is probable, that, in general, we can employ nothing better than much dry friction, and particularly persevering exercise

of the limbs themselves, as soon as they have recovered the slightest degree of motion which shall make them capable of it.*

* For a variety of important matter relating to the whole subject of apoplexy and palsy, see the learned work of Dr. Cooke, "on Nervous Diseases and on Palsy."

APPENDIX

TO

PART SECOND.

CONJECTURES IN REGARD TO THE CIRCULATION IN THE BRAIN.

In our preceding investigations on the pathology of apoplexy, every attention has been paid to confine the observations that were offered, to a direct induction from the facts which were before us. Nearly connected with these investigations, however, there are certain views relating to the circulation in the brain, which perhaps may be regarded as legitimate conjectures. I place them in this manner distinct from the other parts of the inquiry, because they cannot be considered as entirely divested of hypothesis.

When a person previously in good health falls down suddenly in a state of perfect apoplexy, and when, the appropriate treatment being promptly applied, this person is speedily restored to perfect health, it is impossible not to feel the deep interest of the inquiry,—what the state of the brain was which produced symptoms of so formidable a kind, and yet was so speedily and so entirely removed? If the patient shall die after lying for a considerable time in a state of perfect coma, and we cannot discover in his brain the smallest deviation from the healthy structure, we feel in no small degree the increasing interest of the inquiry. It is probable that the source of these remarkable derangements in the

brain, in as far as it is within our reach, is to be sought for in an interruption of the due relations which ought to exist betwixt the arterial and venous systems of the brain. On this subject there are certain principles which appear to result from peculiarities in the structure of the head, and which do not apply to any other organ in the body.

The facts, on which this investigation is primarily founded, are derived from the appearance of the brain in animals which have been bled to death. While in such cases, all the other organs of the body have been found completely blanched or drained of blood, the brain has in general presented in this respect its usual appearance, and, in some cases, the superficial cerebral veins have even been found in so distended a state, that one writer has proposed the paradox, that animals which have been bled to death, die of apoplexy. The most able and most satisfactory observations on this subject are those of the late Dr. Kellie of Leith,* made upon animals bled to death under a variety of circumstances. The brain in most of these cases, presented its usual appearance, its blood-vessels being well filled; while in others, the appearances were still more remarkable. In one, the sinuses were loaded with dark blood, and the vessels of the pia mater were delicately filled with florid blood. In another, the sinuses were loaded with blood, the veins of the pia mater were well filled, and the choroid plexus was remarkably turgid. In a very few only of the examples it is remarked, that the vessels of the brain contained sensibly less red blood than in the other cases, and in all of these there was observed some serous effusion. On the other hand, when these experiments were repeated on other animals after a small opening had been made in the cranium by the trephine, the brain was found as much drained of blood as any

* Transactions of the Medico-Chirurgical Society of Edinburgh, vol. i. Besides the experiments alluded to, I refer to this valuable communication for a variety of most interesting facts and speculations in regard to the whole of this curious subject.

other part of the body. Dr. Kellie adds to these experiments, an account of observations which he made along with Dr. Monro, on the brains of two men that had been hanged. On dividing the scalp, in these cases, the blood flowed in such quantities as to afford ample proof of the congestion in the vessels exterior to the cranium, but nothing unusual was observed in the brain. "The sinuses contained blood, but in no extraordinary quantity; the larger vessels on the surface, and betwixt the convolutions, were but moderately filled, and the pia mater was, upon the whole, paler and less vascular than we often find it in ordinary cases."—To these important facts I have only to add another of a very interesting nature, mentioned by M. Gendrin. With the assistance of M. Beclard, he examined minutely the brains of two persons who had been put to death by decapitation; and they were both greatly astonished at the turgid state of the cerebral vessels, which they had expected to find empty.

These remarkable facts lead our attention to certain peculiarities in the structure of the head, to which they may probably be traced in a very satisfactory manner. The cranium is a complete sphere of bone, which is exactly filled by its contents, the brain, and by which the brain is closely shut up from atmospheric pressure, and from all influence from without except what is communicated through the blood-vessels which enter it. In an organ so situated, it is probable, that the quantity of blood circulating in its vessels cannot be materially increased, unless something give way to make room for the additional quantity, because the cavity is already completely full; and it is probable, that the quantity cannot be materially diminished, unless something entered to supply the space which would become vacant. In this investigation it is unnecessary to introduce the question, whether the brain is compressible, because we may safely assert that it is not compressible by any such force as can be conveyed to it from the heart through the carotid and vertebral arteries. Upon the whole then I think we may assume the position as being in

the highest degree probable, that, in the ordinary state of the parts, no material change can take place in the absolute quantity of blood circulating in the vessels of the brain.

But the blood circulating in these vessels must be divided in a certain ratio betwixt the arteries and veins of the brain; and it is probable that the healthy state of this organ will depend upon the nice adjustment of the circulation in these two systems. If we could suppose a case in which more than the usual quantity of blood was accumulated in the one system, the necessary effect would be a corresponding diminution in the other, because the whole mass of blood in the brain must, by the supposition, remain the same. Hence would arise a derangement of the circulation, such as could not occur in any other part of the body, because there is no other organ so situated as the brain. We must be cautious, however, of speculating where it is difficult to avoid falling into error, and must satisfy ourselves with attempting to trace, in a very general manner, the various ways by which, in such an organ as the brain, derangements of circulation may be supposed to take place.

I. Let us suppose a very plethoric state of the body, in which the general vascular system is loaded with more than the average or healthy quantity of blood. The arteries going to the head will partake of this general condition, and there will be an effort or impulse which tends to propel an undue quantity of blood into the arteries of the brain. Though no addition to the whole quantity of blood in the brain can actually take place, because the vessels of the brain are already full, the constant impulse will be such as tends to introduce an additional quantity, and consequently tends to derange the healthy relation betwixt the arterial and venous systems; for any increase of quantity in the one system could not take place without a corresponding diminution of the quantity in the other. Let us say, for example, that the whole blood circulating in the

brain is as ten, and that it is divided between the arteries and veins as five to five. In the loaded state of the system now referred to, we can suppose a case, in which, by some sudden impulse from the general circulation, the arteries of the brain are, at a particular moment, distended by a quantity as six. In any other part of the body, this would be followed by a similar distention of the corresponding veins, and the healthy balance of the circulation would be speedily restored. But in the brain the very reverse would happen; for as the whole mass of blood must continue as ten, if the arteries were thus distended by a quantity as six, the quantity in the veins must be, by the same impulse, diminished to four, because the increased capacity in the one system of vessels, can be gained only by an instant and corresponding diminution of capacity in the other. The result of the condition so produced would be the following. The arteries of the brain would contain a quantity of blood as six, while the veins would contain and could transmit a quantity only as four. The quantity transmitted by the veins would then be the measure of the quantity that could enter the arteries from the general circulation, namely, a quantity as four. But the impulse from the general circulation would be such as tended to introduce a quantity as six, supposing the continuance of the undue impulse from which the disease originated, or a quantity as five, supposing the impulse to have subsided to the state of health. In either case the impulse would be such as tended to introduce a greater quantity than could enter, and consequently to keep up the deranged state of the cerebral vessels which had taken place. The farther result of this would be, an increased flow of blood into the external vessels of the head, producing probably flushing, turgidity of features, and other marks of increased determination to the external parts. I am aware that this is hypothetical and conjectural; but, from the nature of the subject, our speculations respecting it must ever remain so. Various facts have been stated, and others remain to be mentioned, which give the conjecture a considerable degree

of probability; and it appears to be the nearest approach we can make towards a distinct conception of that condition to which we give the name of congestion in the brain.

II. If there be any considerable interruption to the return of the blood from the veins of the brain, a derangement will take place very analogous to that supposed under the former head. If the quantity of blood which is actually returned by the veins be considerably diminished, there will be a corresponding diminution of the quantities which can enter the arteries. The healthy impulse from the general circulation will then become, in reference to the actual state of the circulation in the brain in this case, what the undue impulse was in the other. But I forbear from urging the inquiry, whether such a derangement as we have now supposed might take place from causes retarding the return of blood from the head, such as tumors on the neck, and certain affections of the heart and lungs; and whether, if it did take place, it might give rise to symptoms analogous to simple apoplexy.

Two points, however, may be briefly alluded to in regard to the parts of this speculation referred to under the two preceding heads. (1.) If such a derangement, as has been supposed, really took place in the vascular system of the brain, it would follow, that the impetus from the general circulation would be such as tended to introduce into the arteries of the brain a larger quantity of blood than could actually enter. One effect of this would be an increased flow of blood into the external vessels of the head, and there are various facts which tend to show that something of this kind does actually take place in the apoplectic attack,—as the flushing of the face, turgidity of the features, throbbing of the external vessels, and other appearances which have been referred to the doctrine of determination to the head. Numerous writers have remarked the unusual quantity of blood which is discharged from the integuments, in opening the heads of persons who have died of apoplexy.

In some of Dr. Cheyne's dissections, upwards of a pound was collected in this manner; and Dr. Kellie made the same observation on the two men whom he examined after execution. Mr. John Bell remarks, that having injected the head of a person who died of an affection of the brain, he found the features so distorted by the injection, the lips so protruded, and all the superficial vessels so much enlarged, as to make the preparation useless. The remarkable turgidity of the features and of the neck, which often occurs in apoplectic cases, must indeed be familiar to every one; and it appears to be most remarkable when the disease has proved rapidly fatal, without any means having been employed. A gentleman, whom I saw with Mr. Whyte, after some symptoms showing an apoplectic tendency, was one morning found dead in bed, his body being scarcely cold. His neck and features were of a deep purple colour, and turgid in a most uncommon degree, but no turgidity was observed in the vessels of the brain. (2.) Upon the grounds already referred to, there is reason to believe, that we cannot, by our evacuations, diminish in any material degree the quantity of blood in the head. But if these conjectures shall be considered worthy of any credit, it will appear probable, that the effect of our evacuations will be to take off from the cerebral vessels, the excessive impulse from the general circulation, or even to reduce it below what would now be considered as a healthy impetus, and thus to leave the vessels of the brain in a state favourable for recovering their healthy relations.

III. A similar derangement might be supposed to take place from causes which directly diminish the capacity of the venous system of the brain. If a depression has been produced of a portion of bone, so as considerably to encroach upon the cavity of the cranium, or if a coagulum of blood has been deposited, so as to occupy a considerable space upon the surface of the brain, the diminution of space thus produced would probably affect chiefly or entirely the venous system of

the brain, the veins being in general more superficial, and more immediately exposed to the pressure, than the arteries. It would not diminish the quantity of blood which tends to enter the arteries of the head, but it would diminish in proportion to its extent the capacity of the veins, and thus derange the relations betwixt the two systems of vessels, in a different manner from that which has been supposed under the former heads, but analogous in its effects upon the circulation in the brain. When, in the former of the cases now supposed, the depressed portion of bone has been elevated, the two systems recover their healthy relations, and the symptoms disappear.

It is probable that a cause of this kind may exist in a smaller degree, in which it shall not produce any permanent interruption of the circulation in the brain, but may give rise to derangement when there is any occasional increase of impetus in the circulation. In the first part of these essays, I have described a remarkable case, in which a tumor, formed by deposition betwixt the laminæ of the dura mater, occupied a considerable space on the surface of the brain. The patient had experienced little inconvenience from it when he was at rest, but, when in motion, he was liable to attacks of an apoplectic nature, from which he recovered in a few minutes. A gentleman, mentioned by Lancisi, who had long suffered from hemicrania, was seized about the age of 50 with intense pain in the temple, and soon after had an attack of apoplexy, from which he speedily recovered; but from this time he had an apoplectic attack once or twice every month. This went on through the following autumn and winter, and he at last died suddenly in one of the attacks. Under the right side of the os frontis, the membranes were much thickened, and, connected with the thickened portion there was a kind of polypus on the surface of the brain. In cases such as these, it is probable, that, when the circulation is in a very tranquil state, or when the general mass of blood has been reduced by evacuations, the circulation in the brain goes on in a healthy manner; but that any in-

crease of the quantity of the blood, or any considerable increase of its impetus, leads to the derangement. It is probable that similar affections might be traced to causes diminishing the area of the sinuses, or of the principal veins of the brain; and I have formerly mentioned some remarkable cases, in which frequent attacks of an apoplectic and paralytic nature appeared to be connected with extensive disease of the arteries of the brain. Facts are wanting on this interesting subject; but many cases are on record in which an individual has suffered in a few years fifteen or twenty apoplectic attacks, without experiencing in the intervals any bad effects from them. Minute attention to such cases may probably lead to results calculated to throw much light upon the pathology of apoplexy.

IV. There are many interesting facts which lead us to believe, that the circulation in the brain may be deranged in a manner remarkably different from any of the preceding cases. Let us suppose that the general volume of blood in the body is very much diminished. The effect of this upon each individual artery is, that its calibre is contracted, and that it acts upon the veins with which it is connected with diminished momentum. The arteries of the brain will partake of the general state of the system, so that the quantity of blood transmitted to the head will be diminished in the same ratio. But while this change is going on, a corresponding accumulation would probably be taking place in the veins, because the whole quantity in the head must continue nearly the same. Upon this increased mass of blood in the veins, the volume in the arteries would now act with a correspondingly diminished and inadequate impetus. It is probably in this manner that there arises the appearance of congestion in the superficial veins of the brain, which has been observed in animals that have bled to death; and many curious facts occur to us in practice, which appear to be referable to a derangement of the circulation in the brain, which can only be accounted for in this manner. I shall relate

some of these facts without indulging farther in speculation.

A gentleman, aged about forty, had been for some time losing considerable quantities of blood by arterial hæmorrhage from the rectum. Considering it as merely hæmorrhoidal, he had paid little attention to it, until his friends became alarmed by his altered appearance. From being strong and rather plethoric, he had become weak, exhausted, pale and haggard. He had anasarca of his legs,—his pulse was frequent and feeble, and much excited by the least exertion. Along with these symptoms, he was liable to strong and irregular action of the heart, and complained of giddiness, tinnitus aurium, violent throbbing in the head, and frequently of throbbing headach. On examining his rectum, a fungous tumor was found within the sphincter, on the apex of which a small artery was bleeding *per saltum*. This was tied, and there was no return of the hæmorrhage; and under the use of nourishing diet, and a liberal allowance of wine, all his other complaints disappeared. He made up so rapidly in flesh and blood, that not long after, apprehensions were entertained that he was becoming too plethoric, and it became necessary to reduce his regimen, but under these circumstances he had no return of the symptoms in his head.

A lady, aged twenty-five, had been frequently bled on account of symptoms in the head which had supervened upon an injury. Considerable relief had followed each bleeding; but the symptoms had soon returned so as to lead to a repetition of the bleeding at short intervals, and this had been going on for several months. When I saw her, she was stretched upon a couch, her face of the most death-like paleness, or rather of the paleness of a stucco figure, her pulse very rapid and as small as a thread, her general weakness extreme. The mass of blood appeared to be reduced to the lowest point that was compatible with life, but she still complained of frequent headach, violent throbbing in the head, confusion and giddiness. It was evident that evacuations could be carried no farther, and, in con-

sultation with a very intelligent medical man who had the charge of her, it was agreed as a last experiment to make trial of the opposite system, nourishing diet and tonics. In a fortnight she was restored to very tolerable health.

Under similar circumstances a friend of mine was called to visit a lady who had suffered from long-continued uterine hæmorrhage. Her general aspect was that of great exhaustion, but she complained so much of throbbing in the head, that her medical attendants were treating her by evacuations and very spare diet. She was restored by nourishment and wine; and as she recovered strength, the feelings in her head entirely disappeared.

I have been repeatedly consulted under the following circumstances. A gentleman accustomed to very full living, is seized with an apoplectic attack, or with symptoms indicating the most urgent danger of apoplexy; he is saved by bleeding and other free evacuations, and is kept for some time upon a very spare diet. His complaints are relieved, and as long as he keeps quietly at home, he goes on without any uneasy feeling. But when he begins to go abroad, he becomes liable to attacks of giddiness and confusion, generally accompanied by palpitation of the heart and an uneasy feeling about the præcordia. His pulse is now soft and rather weak, and his general appearance indicates the very reverse of plethora; and these symptoms are removed by a cautious improvement of his regimen. This curious fact I have repeatedly had occasion to attend to in the treatment of cases of this kind, and it has always appeared to me to be one of very great interest in reference to the pathology of the brain.

Various other facts will present themselves to the practical physician, which bear upon this curious subject. In the last stage of diseases of exhaustion, patients frequently fall into a state resembling coma, a considerable time before death, and while the pulse can still be felt distinctly; and I have many times seen children lie for a day or two in this kind of stupor, and

recover under the use of wine and nourishment. It is often scarcely to be distinguished from the coma which accompanies diseases of the brain. It attacks them after some continuance of exhausting diseases, such as tedious and neglected diarrhœa; and the patients lie in a state of insensibility, the pupils dilated, the eyes open and insensible, the face pale, and the pulse feeble. It may continue for a day or two and terminate favourably, or it may be fatal. This affection appears to correspond with the apoplexia ex inanitione of the older writers. It differs from syncope in coming on gradually, and in continuing a considerable time, perhaps a day or two; and it is not, like syncope, induced by sudden and temporary causes, but by causes of gradual exhaustion going on for a considerable time. It differs from mere exhaustion, in the complete abolition of sense and motion, while the pulse can be felt distinctly, and is in some cases of tolerable strength. I have seen in adults the same affection, though it is perhaps more uncommon than in children. A man considerably advanced in life, in consequence of a neglected diarrhœa, fell into a state closely resembling coma; his face pale and collapsed, but his pulse of tolerable strength. An elderly lady from the same cause, had loss of memory and squinting. Both these cases recovered by wine and opiates; in the former, blistering on the neck was also employed. Richter states that amaurosis has been produced by hæmorrhage, cholera, and tedious diarrhœa; and he mentions particularly a dropsical woman, who became blind when the fluid was evacuated from her abdomen by tapping. On this interesting subject, I shall at present only add the following remarkable illustration from an affection of hearing. A gentleman, about 30 years of age, came to Edinburgh from a distance for advice in regard to an obscure affection, referred chiefly to the stomach, which had reduced him to a state of extreme weakness and emaciation. As the debility had advanced, he had become considerably deaf, and when I saw him he was affected in the following manner. He was very deaf while sitting erect

or standing, but, when he lay horizontally, with his head very low, he heard perfectly. If, when standing, he stooped forward so as to produce flushing of his face, his hearing was perfect, and, upon raising himself again into the erect posture, he continued to hear distinctly as long as the flushing continued; as this went off the deafness returned.

Upon the whole, it seems highly probable that a certain balance of the circulation of the brain is necessary for the healthy condition of its functions; that they are equally impeded by the interruption which takes place in apoplexy, and the diminished impulse which occurs in syncope and in many affections of extreme exhaustion; and that there is a remarkable similarity in the symptoms which occur in these opposite conditions. What indeed is syncope, but an abolition of sense and motion? It is preceded by giddiness, tinnitus aurium, and impaired vision, and is accompanied by blindness, dilated pupil, perfect insensibility, and not unfrequently passes into convulsion. It differs then from apoplexy, chiefly or entirely in the state of the general circulation, the symptoms accompanying the two affections being remarkably similar, and the effect upon the sensorial functions almost entirely the same.

Here however some questions occur: If the circulation in the brain be so nicely and so peculiarly balanced, why is it not seriously deranged by the numerous changes which are constantly occurring amid the variety of circumstances to which the body is exposed? Why is not apoplexy produced by every increase in the mass of blood, or why is it not excited by every instance of intemperance, violent exercise, or strong mental emotion? Is there any provision by which the effects of these causes are averted in their daily occurrence, though in a certain condition of the system, each of them may be capable of producing perfect apoplexy? It seems probable that there are several circumstances in the anatomy of the head which contribute to this important end, but I shall merely allude to them with-

out entering upon the speculations to which they might lead. One is, that all the arteries of the brain enter the head through continued canals of bone. These appear to have considerable influence in arresting any sudden impulse of blood, and in directing it off to the external branches. Hence the flushing of the face, turgidity of the features, and throbbing of the external vessels, which often occur in such cases, while no affection in the brain follows. Another circumstance, which seems to contribute to the same purpose, is the peculiar structure of the sinuses of the dura mater. These at all times must contain a considerable proportion of the venous blood of the brain, and from their peculiar structure it seems probable that they are not liable to have their area either increased or diminished in any considerable degree. This remarkable structure must operate very considerably in preventing those derangements of the circulation which have been referred to in the preceding speculations, and which, in an organ situated as the brain is, must otherwise have taken place from very slight causes.

PART III.

OF THE ORGANIC DISEASES OF THE BRAIN.

By organic diseases of the brain we understand, either permanent changes of the cerebral substance itself, or new formations within the head. These may be either embedded in the substance of the brain, or attached to its surface. The principal forms under which we meet with these affections may probably be referred to the following heads:—

I. Tumors formed by thickening of the membranes of the brain, or by deposition of new matter betwixt their laminæ. Of this I have already given a very remarkable example, (Case VI.) in which a tumor five inches long, three inches broad, and half an inch in thickness, was formed in this manner by a deposition of new matter betwixt the laminæ of the dura mater.

II. Deposition of a pellucid or semi-pellucid substance having the characters of albumen. This may either be formed in undefined masses under the membranes of the brain, particularly under the arachnoid, as in Case XCII., or contained in distinct cysts in various parts of the brain, as in the Cases XC. and XCI. The substance which is deposited in these cases coagulates into a firm mass in the heat of boiling water. It is met with in various degrees of consistency, and there is some reason to believe that it undergoes remarkable

changes in density, assuming a firmer texture in certain stages of its progress.

III. A very dense tumor, of a uniform whitish or ash colour, and exhibiting the appearance and the properties of coagulated albumen. This substance is found in distinct rounded tumors of various sizes, which are generally attached to the dura mater, and do not appear to be covered by any cyst. I have described one which grew on the falx in Case LXXXVII., nearly five inches in circumference, and uniformly white and firm in its consistence; it did not appear to be organized, and when analyzed exhibited the properties of coagulated albumen. The remarkable circumstance in this case was, that no urgent symptoms arose from the presence of this mass until a few weeks before death. Tumors of this kind sometimes arise from the external surface of the dura mater; in this case they have been frequently known to produce absorption of the bone, and to rise externally under the integuments of the head, so as to be mistaken for wens. Many cases of this kind are mentioned by the French writers. In some of them, the disease seems to have been originally excited by injuries; and in others, an injury appears to have accelerated the process by which the tumor was making its way through the bone. When these tumors have been rashly meddled with by incision, death has generally been the consequence. Small tumors which resemble those of this class, are sometimes met with attached to the choroid plexus. I have seen one in each lateral ventricle, the size of small hazel nuts, in a man who died suddenly after having had repeated epileptic attacks at long intervals, and having been for some time affected with symptoms threatening apoplexy.

IV. Tumors externally resembling those of the former class, but internally presenting an organized appearance, and a reddish or flesh-colour, resembling the substance of the kidney. These are met with in various situations; one will be described, the size of an egg, which grew from the tentorium. The two appearances, described

under this and the former heads, seem to include the most common characters of what may be properly called tumors of the brain. Steatomatous and fatty tumors are likewise described, but they appear to be more uncommon.

V. Tubercular disease. Of this very frequent appearance several examples have already been given. It occurs in masses, varying in size from the smallest size to that of an egg; and these may be either embedded in the substance of the brain, or attached to the membranes. In their earlier stages, they present to us a whitish coloured cheesy matter, generally enclosed in a cyst; but, in their more advanced forms, we generally find them presenting a greater or less degree of unhealthy scrofulous suppuration.

VI. Induration of the cerebral substance. Several examples of this important affection have been already referred to under the first part of these essays. I have there stated the grounds for believing, that it is the result of a slow inflammatory action; that it may continue for a very considerable time in a state of simple chronic inflammation, and then pass gradually into a state of induration; and, it is probable, that there is in some cases formed around the diseased portion, a sac of coagulable lymph, giving it the appearance of a new formation embedded in the substance of the brain. In the state of simple induration, this disease may continue for a long time, producing urgent symptoms, and may at length be fatal by passing into suppuration, or without having suppurated.

VII. Ossifications. Under this head are to be included both osseous projections from the inner surface of the cranium, and internal ossifications, which are commonly found in the dura mater, most commonly in the falx. They generally appear to be formed of thin laminæ of bone in the substance of the membrane, and many cases of them are on record which did not appear to have produced any symptoms in the brain. In other cases, however, they seem to produce urgent symptoms, especially when they are in the form of sharp spiculæ,

or have acute angles which are so situated as to irritate the brain or its membranes. In a case of this kind by Saviard, there was in the broadest part of the falx a small triangular piece of bone with very sharp angles; and, where the dura mater came in contact with these angles, it was livid and discharged pus. In another by La Motte, which was connected with epilepsy, the bony spiculæ were directed against the pia mater; and in one by Van Swieten, there was an irregular piece of bone an inch long, and half an inch broad, in the substance of the cerebellum.

VIII. Hydatids. This name has been applied to several affections of the brain, some of which do not appear to be really hydatids. Of this kind are the vesicles which are often met with in the choroid plexus; they seem to be merely the loose cellular texture of that organ, elevated into vesicles by a watery effusion; and in a case by Dr. Baillie, they could be injected from the veins. Real hydatids, however, do occur in the brain, as in a case which will be quoted from Zeder, in which there were numerous hydatids, one of them the size of an egg, and containing three small hydatids within it. Cysts containing a watery fluid likewise occur in various parts of the brain; but it is doubtful whether they are to be considered as hydatids. A woman mentioned by Bonetus, after a blow on the back of the head, had headach for a year with constant vertigo, and then died apoplectic. In the substance of the left hemisphere, there was a cyst the size of an egg, which contained a clear fluid. In a girl mentioned by the same writer, who died, on the 12th day, of a febrile disease, which ended in coma, there was found, on separating the two hemispheres, a cyst which burst on a slight touch, and discharged limpid fluid to eight or nine ounces. Bonetus mentions other cysts of a still larger size, one especially attached to the nates and the infundibulum, which burst on taking it out, and discharged fluid to the amount of two pounds. The patient had complained of fixed pain in the vertex for four months. I was long inclined to doubt the accuracy of these ac-

counts, and to suppose that, in such cases, the fluid had really been contained in the ventricles, until I received, through my friend Dr. Frampton, the remarkable case by Mr. Headington, to be afterwards described, in which a cyst was found in the left ventricle containing sixteen ounces of fluid.

The affections now briefly described seem to include the principal modifications of the organic diseases of the brain. Others, however, are met with which do not properly belong to any of these classes, such as the stony tumor in a case to be quoted from Schenkius, the bloody tumor of Rochoux, and the real fungus hæmatodes of the brain, of which there are some examples on record. Fungous protrusion of the cerebral substance itself, such as occurs after the operation of the trephine, is occasionally met without any such cause. A man mentioned by Dr. Donald Monro, had a pulsating tumor over the left eyebrow, pressure on which produced headach and giddiness. It increased in size, and after seven months he died lethargic. On inspection the tumor was found to arise from the anterior part of the left hemisphere of the brain, and to have made its way through the frontal bone. It was the size of a China orange; in its structure it resembled the medullary substance of the brain; and it appeared to be covered by the dura mater.*

When we endeavour to trace the leading symptoms connected with these various states of disease, we do not find any uniformity, by which particular symptoms can be distinctly referred to the various forms of the morbid affections; we can therefore attempt only a very general outline of the principal modifications of the symptoms, which are connected with organic disease of the brain. They appear to be chiefly referable to the following heads.

I. The first class is distinguished by long-continued

* Trans. Col. Phy. vol. i.

and severe headach, without any other remarkable symptom. The pain varies very much both in its seat and in its severity; and one very remarkable character of the affection is, that the pain sometimes occurs in regular paroxysms, leaving intervals of comparative or complete relief. Some remarkable examples have already been given of this in Cases LXXXIII. and XC., and others will be afterwards referred to. The pain is in some cases acute and lancinating, in others obtuse; and it is sometimes referred to a particular spot, as the crown of the head, or the occiput. In many cases it is accompanied by a violent throbbing, and this also may be general, or it may be referred to a particular part of the head, as the occiput or one temple. In the more violent paroxysms the pain is intense, obliging the patient to remain for a considerable time in one position, the slightest motion aggravating it to perfect torture; but the remissions from this severe suffering are often so remarkable as to lead a superficial observer into the belief that it is merely periodical headach, or headach connected with dyspepsia. This latter supposition is also countenanced by the stomach being frequently much disordered, and by the more violent attacks being often accompanied by vomiting. The diagnosis, indeed, is sometimes difficult, but, by attention, it will be found that the duration and violence of the pain must lead to a suspicion that the complaint is something more than common headach, and that, though the stomach is at times disordered, yet that the headach is often most severe when no disorder exists in the stomach that can account for it. The patient generally cannot bear a warm room, the noise of company, or even the exertion of cheerful conversation, without being distressed and his headach increased; and the same effects are produced by wine and bodily exertion. He seeks quietness, coolness, and darkness; and in these respects, the disease differs remarkably from dyspeptic headach, which is commonly dissipated by exercise and cheerful company. Sometimes the paroxysms are accompanied by vomiting, and sometimes by violent

throbbing in the head. If, along with these local symptoms, the face be pale and the pulse feeble, and if much active treatment has been employed without relief, we must suspect the presence of organic disease. The terminations of the cases of this first class are various; they may be suddenly fatal by convulsion, or more gradually by coma, or by gradual exhaustion without either coma or convulsion. A very frequent termination is by the accession of chronic inflammation, terminating by effusion or otherwise. In Case LXXXVII. I have given an example in which there was a remarkable mass of organic disease attached to the falx, while no symptoms had indicated its existence, until the occurrence of the symptoms of chronic inflammation a few weeks before death.

II. In the second form, after some continuance of fixed headach, the organs of sense become affected, as the sight, the hearing, the taste and smell, and occasionally the intellect. The loss of sight generally takes place gradually, being first obscured, and after some time lost; and very often one eye is thus affected before the other is at all impaired. Double vision also occurs, which either may be permanent or occur at intervals. One remarkable case will be referred to, in which the blindness took place rather suddenly, and, after it had continued for some time, sight was restored under the action of an emetic. It remained distinct for an hour, and then was permanently lost. The intellect is frequently impaired in cases of this class, and sometimes the speech is lost. The morbid appearances present no uniformity; in two of them there were tumors so situated, as directly to compress the optic nerves; in another, a large tumor pressed upon the corpora quadrigemina; in a third, the disease was situated at the lower part of the anterior lobe; and in another, in which the right eye only was affected, it was in the substance of the left hemisphere, near the posterior part. In a case by Drelincurtius, the disease was an enlargement of the pineal gland; and in another, in which,

there were both blindness and deafness, a large tumor was situated between the brain and the cerebellum.

III. The third class corresponds with the second in the pain and affections of the senses, with the addition of paroxysms of convulsion. These may occur with some degree of regularity like epilepsy, or may take place only at particular periods, when the disease seems to be aggravated, and to be combined with some degree of inflammatory action. Sometimes the paroxysms have a resemblance to tetanus, and in other to slight apoplectic attacks. A case of this kind will be referred to, in which there was loss of sight, hearing, smell, and speech, and at last of the power of deglutition.

The cases of this class present the same varieties of morbid appearance as the former, and no peculiar character can be traced in them, which enables us to explain the diversities of symptoms in the three classes, except in regard to those cases in which the disease was so situated, as directly to compress the optic nerves. This seems invariably to produce blindness; but, in other cases, it will appear that tumors corresponding in their situation, and nearly of similar size, were in some cases accompanied with blindness and convulsion; in others by blindness without convulsion; and in others by pain alone, without either of these affections. One case which will be referred to was remarkable from the circumstance, that the convulsions ceased when the lungs became affected, and did not return, the affection of the lungs being fatal.

IV. The fourth class is distinguished by convulsion, without any affection of the senses, often with very little complaint of pain, and in general without that fixed and constant pain which occurs in the other classes. The convulsion in some cases appears under the regular form of epilepsy; in others, in more irregular attacks, occurring repeatedly for a short time, and then ceasing for a considerable interval. Sometimes violent paroxysms of headach precede or accompany the convul-

sions, and, generally, after some time, the memory is impaired. The cases of this class may be fatal in one of the attacks of convulsion, or by coma of some days continuance. The morbid appearances are very various. The most remarkable in the cases to be referred to were, tubercles in the cerebellum, an hydatid in the right hemisphere of the brain, induration of the pons Varolii or of the substance of the brain, and tumors and bony spiculæ in various situations. An important variety of the disease occurs, in which the convulsion is confined to one side of the body. In one case of this kind, there was a tumor on the surface of the opposite hemisphere, and in another a portion of the opposite hemisphere was indurated; the former case was also remarkable from the long continuation of the disease, and from the weakness and diminution of size of the lower extremity of the affected side.

V. The fifth class leads our attention to a new set of symptoms, namely, the paralytic. These may occur in the form of hemiplegia, paraplegia, or paralysis of all the parts below the neck, and in some cases one limb only is affected. The disease is distinguished from the ordinary paralytic cases, by coming on more gradually; one limb, perhaps, or part of a limb, being first weak, and the weakness extending very gradually, until it amounts to paralysis. In some cases the paralysis is preceded by violent pain in the limb. The speech is generally affected, and in many cases the memory; there may be fixed uneasiness in the head, or headach occurring in paroxysms. In one case, there was blindness of one eye; in another, of both. In one, there occurred convulsion, but not till an advanced period; in another, epilepsy for more than a year. The inspections exhibit tumors or indurations, variously situated; in the cases of hemiplegia, on the opposite side of the brain; in those of paraplegia, in the cerebellum or tuber annulare. It must, however, be confessed, that the cases of this class, with paraplegia, are rather unsatisfactory from want of attention to the condition of the

spinal cord. In several cases to be afterwards described, it will be found that though there was disease in the brain, the real cause of the paraplegia appeared to be in the spinal cord; and, perhaps, it may be considered as a point not yet ascertained, whether paraplegia ever arises from disease confined to the brain.

VI. The sixth class calls our attention to a subject of much interest; a train of symptoms which are referred to the stomach, but which really depend upon disease in the brain. In many of the cases of organic disease of the brain, the stomach is affected; but those to which I now allude, are remarkable from the affection in the stomach being the prominent symptom. In these there is often, through a considerable part of their progress, very little complaint of the head, or no complaint so fixed and urgent as to direct our attention to the brain as the seat of the disease. There is generally, however, some pain or weight in the head, sometimes occurring in paroxysms like periodical headach, or in paroxysms accompanied by vomiting, like what is commonly called sick headach. The pain is increased by exertions, external heat, passions of the mind, and stimulating liquors; there is generally variable appetite, bad sleep, oppression of the stomach, and frequent vomiting. The vomiting sometimes occurs in the morning on first awaking, and sometimes at uncertain intervals, and very suddenly without any previous sickness. There are, in general, uneasy sensations referred to various organs, by which the nature of the disease may be disguised in its earlier periods; but, after a certain time, symptoms referable to the head generally begin to appear, such as fits of loss of recollection, convulsive paroxysms, and affections of sight. After this stage of the disease, death may occur suddenly in an attack of convulsion, or it may be preceded by a train of severe suffering. In cases of this class, we must beware of being misled in regard to the nature of the complaint, by observing that the symptoms in the stomach are alleviated by a strict regimen, or by treatment directed

to the stomach itself. If digestion be impeded from whatever cause, the uneasy symptoms may in this manner be alleviated; but no inference can be drawn from this fact, in regard to the cause of the derangement. In the earlier periods of this affection, the diagnosis is indeed often very difficult. There is generally more permanent and fixed uneasiness in the head, than we should expect to find in a dyspeptic case, and the uneasiness is increased by causes which would probably be beneficial to a dyspeptic headach, such as activity and cheerful company. The prominent morbid appearances in cases of this class seem to be in the cerebellum.

VII. The seventh class is distinguished chiefly by slight and transient affections of an apopletic character, of which I have formerly given some remarkable examples. In some cases, it consists chiefly of an habitual giddiness, which makes the patient afraid to walk alone; in others, there are sudden attacks of loss of all muscular power without loss of recollection, which are soon recovered from. Sometimes there are attacks of perfect coma, which may occur at regular or at irregular intervals: the patient having, in some cases, such warning of their approach that he goes to bed before the attack. There is usually more or less unsteadiness of the limbs, and generally, but not always, headach. In some cases there are affections of sight, and these may either be permanent or occur in paroxysms; and in some cases, giddiness and loss of recollection are excited by bodily exertion, and go off on desisting from it.

This imperfect outline of a most important class of diseases, I shall illustrate by a selection of cases in an Appendix, partly from my own observation, and partly from other authorities. From these will appear the extreme difficulty of fixing upon any general principles, or of referring the particular character of the symptoms to any thing in the seat or nature of the disease. Tumors, for example, will be found under the first class, unaccompanied by any remarkable symptoms; while,

under the other classes, tumors in the same situation, and of no larger size, were accompanied by blindness, convulsions, or paralysis. It does not appear that these diversities depend either upon the size of the tumors, or, as far as we know at present, upon their particular structure. But these points remain to be investigated; particularly what diversity of symptoms is connected with the nature of the tumors, and especially with their characters, as being tumors distinct from the cerebral mass, or as being indurations of the substance of the brain itself.

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

I conclude this part of the subject with the following important case, which I received from my friend the late Dr. Kellie of Leith. It illustrates, in a very striking manner, the nature of the symptoms which may exist with most extensive and remarkable organic disease of the brain.

Case CXL.—A medical gentleman, aged 56, of a cultivated mind and temperate habits, had been for some time liable to various ailments, which his medical friends considered as in a great measure hypochondriacal. The most defined complaints were occasional uneasiness in the site of the frontal sinus, and a very peculiar feeling of numbness in the point of the thumb. But his general health appeared good, and he was able to enter into all the usual enjoyments of life, having retired from

practice, till he was one day seized, while walking, with sudden sickness and faintness. These were followed by some headach, and an obvious difficulty of articulation, or rather a difficulty in finding the expression which he wished to make use of. He was now treated by bleeding and the other usual means; but this peculiar loss of the recollection of words continued and gradually increased, so that he had greater and greater difficulty in recollecting the words which he meant to employ, but he had no difficulty in pronouncing them. His understanding, at this time, was quite entire; his pulse varying from 80 to 112. He was nearly confined to the house, but out of bed during the day; and all the usual remedies were employed in the most assiduous manner. After he had gone on in this way for several weeks, he began to have slight distortion of the mouth, and complained of numbness of the right arm, and soon after of weakness of the right leg. These symptoms gradually increased to perfect hemiplegia; and about this time, also, he entirely lost his speech. He was now confined to bed, but without coma. He had the perfect use of his sight and hearing, and, as far as could be judged, his understanding was entire. He died with symptoms of bronchitis in the ninth week from the first attack.

Inspection.—The left hemisphere of the brain was found to be diseased throughout in a very singular manner. Some parts of the mass were indurated, others softened; and it presented a variety of colours, chiefly a rose-colour, grey, and yellow; and the more diseased portions were highly vascular. In some places there were distinct insulated masses, enclosed in vascular cysts; these were generally indurated, but some were softened, and they were of a rose or flesh-colour passing into grey. The change from those parts which retained a natural appearance to these degenerated portions was abrupt, and marked by a rose-coloured line. These rose-coloured portions were chiefly in the parts nearest the surface: in the central parts this passed into the yellow or the grey, and many portions were in a state of ramollissement. The whole left hemisphere, in fact, presented

little else than a mass of concentric indurations and softenings of the various colours which have been mentioned. On the upper part of the hemisphere the disease did not extend entirely to the surface of the convolutions; but at the base of the anterior and middle lobes it extended to the surface, and at one place there was a well-defined spot of superficial ulceration the size of a split pea.

PART IV.

OF THE DISEASES OF THE SPINAL CORD AND ITS MEMBRANES.

In its structure, the spinal cord is very analogous to the brain, except that it is more dense in its consistence. The membranes of the cord are usually divided into three, the dura mater, arachnoid, and pia mater; but as that which has been termed the arachnoid seems rather to be a kind of loose cellular texture, scarcely deserving a distinct name, it will answer every practical purpose to consider the membranes as two.

I. The dura mater of the cord does not differ in structure from that of the brain, except in varying considerably in thickness at different parts. The principal facts to be kept in mind in a practical point of view are, that it adheres very slightly to the canal of the vertebræ by a very loose cellular texture, and that it adheres very intimately to the margin of the foramen magnum. In this manner a cavity is produced betwixt the membrane and the canal of the spine, which may be the seat of effusion, and which has no communication with the cavity of the cranium; on the other hand, the space betwixt the dura mater and the pia mater, or the immediate covering of the cord, communicates freely with the cavity of the cranium, so that a fluid may pass easily

from the one to the other, according to the position of the body.

II. The pia mater, or proper covering of the cord, is a membrane of a loose or cellular texture. It seems to be continuous from the pia mater of the brain, is closely attached to the body of the cord, and furnishes a covering to the nerves which issue from it.

III. The substance of the cord is firmer than that of the brain, but in other respects analogous to it; being distinguished into cortical and medullary matter. It is divided into four columns, the two anterior of which take their origin from the crura cerebri, and the two posterior from the crura cerebelli. The spinal nerves arise by two distinct roots from one of the anterior, and one of the posterior of these columns; and recent investigations have rendered it probable, that a diversity of function is concerned in the double origin, that is, that the posterior columns give origin to the nerves of sensation, and the anterior to the nerves of motion. A canal has been described in the substance of the cord, which is said to be a seat of serous effusion, and to communicate with the fourth ventricle. On the authority of Portal, Senac, Rachetti, and others, we cannot doubt that such a canal has been observed, but it seems very doubtful, whether it exists in the healthy state of the parts. In Portal's case, it extended as far as the fourth dorsal vertebra, and would have admitted a common quill. It was full of serous fluid, by which the ventricles of the brain were likewise distended.

By the ancients, much importance was attached to the spinal cord in convulsive and paralytic affections, but their speculations seem to have been in a great measure conjectural. A correct pathology of the cord appears to be of very modern date, and perhaps may still be considered as being in a very imperfect condition. In attempting a general outline of it, I shall

satisfy myself with a simple record of the best authenticated facts, which may be arranged under the following heads:

I. Acute inflammation of the membranes, or meningitis of the cord.

II. Inflammation of the body of the cord, terminating by ramollissement or suppuration.

III. Serous effusion in the spinal canal.

IV. Extravasation of blood in the spinal canal, or spinal apoplexy.

V. Fungoid disease and thickening of the membranes.

VI. Induration of the cord.

VII. Compression of the cord by new formations within the canal, as tubercles, albuminous depositions, hydatids, and ossification of the membranes.

VIII. Destruction of a portion of the cord.

IX. Concussion of the spinal cord.

X. Certain affections of the bones of the spine.

SECTION I.

MENINGITIS OF THE CORD.

Of this remarkable affection, I am enabled to give the two following examples, the second of which I received from the late Dr. Duncan. The other I did not see during the life of the patient, but I was present at the examination of the body. I shall merely relate the cases, without founding upon them any general conclusions in regard to the characters of the disease.

Case CXLI.—A gentleman, aged 26, had been for several years liable to suppuration of the left ear. It

usually discharged at all times a little matter, but the attacks of pain were followed by more copious discharges;—the pain on these occasions extending over the left side of his head, and often continuing for a week with much severity. In the first week of April, 1817, he was confined from his usual employments by headach, which affected both the forehead and the occiput; he lay in bed only part of the day; his appetite was bad, and his sleep disturbed; but there was little or no frequency of pulse, and for a week the complaint excited little attention. About the end of the week, he complained of pain extending along the neck, and in the beginning of the second week the pain in the head nearly ceased, but the pain in the neck became more severe, and extended farther downwards along the spine. It continued for several days to extend farther and farther down, until at last it fixed with intense severity at the lower part of the spine, and extended from thence round the body, towards the spinous processes of the ilia. From this time he never complained of his head, and seldom of the upper parts of the spine; but he became affected with great uneasiness over the whole abdomen, and great pain and difficulty in passing his urine. From the violence of these complaints, his sufferings about the 15th became extreme; he could not lie in bed for five minutes at a time, but was generally walking about the house in a state of extreme agitation, grasping the lower part of his back with both his hands, and gnashing his teeth from the intensity of pain; he had no interval of ease, and was sometimes incoherent and unmanageable. On the 16th he went to the warm bath, walking down three stairs, and into an adjoining street, with little assistance. After his return from the bath he thought himself somewhat relieved, but the pain soon returned with its former severity, accompanied by great pain in the belly, severe dysuria, confusion of thought, and some difficulty of articulation. The pulse was about 100, and the bowels were easily kept open by the ordinary medicines. On the 17th, the symptoms

were unabated; his speech was considerably affected; there were convulsive twitches of his face, and difficulty of swallowing; some squinting also was observed, but it was not permanent; the pulse was from 120 to 130. At night he became easier after a bleeding from the arm, and lay in bed for some time. After a short time, however, he got up again, and continued till three o'clock in the morning, sitting up, or walking about his house delirious and unmanageable. About three o'clock, while sitting in a chair, he suddenly threw his head backwards with great violence, and immediately fell into a state of coma, in which he continued for two hours, and then died. No paralytic affection had been observed in any period of the disease, except the slight affection of his speech, no difficulty of breathing, no vomiting, and no convulsion except the twitches of the face on the 17th. The pulse had varied from 90 to 130, and was reported to have been generally small and irregular. The bowels were easily kept open, but the pain in the back was much increased by going to stool. Two days before his death he had several attacks of shivering. During his illness, much purulent matter had been discharged from the left ear, and an inflamed tumor had formed behind it.

Inspection.—After the most careful examination, every part of the brain was found to be in the most healthy state. On taking out the brain, some gelatinous deposition was found under the medulla oblongata, and purulent matter appeared in considerable quantity, flowing from the spinal canal. The spine being entirely laid open, the cord was found with a coating of purulent matter, which lay betwixt it and its membranes. The matter was most abundant at three places; at the upper part near the foramen magnum, about the middle of the dorsal region, and at the top of the sacrum; but it was also distributed over the other parts with much uniformity. The substance of the cord was very soft, and in some places much divided into filaments. All the other viscera were healthy.

Case CXLII.—A woman, aged 22, had been for more than three weeks affected with pains of a rheumatic character, extending over every part of the body, when, on the 11th of April, 1820, she was received into the clinical ward, under the care of Dr. Duncan. She then complained of pain in the back of the neck and loins, and at the top of the right scapula; also of an acute pain in the right hypogastric region, increased by pressure and by inspiration. The head was considerably retracted, and could not be bent forward; the spine was bent backwards, and the muscles of the back felt contracted and rigid. She had alternate rigors and flushes of heat, great restlessness; pulse 148 and full; respiration 44, with some cough; tongue foul; bowels confined. She was treated by large bleeding, purging, warm bath, &c. On the 12th there was little change. On the 13th, she had difficulty of swallowing, and great restlessness; the spine was curved backwards as before, and the bowels were obstinate, pulse 144. On the 14th, after free purging was produced, she seemed somewhat relieved, and could bring her head a little forward; but she said the pain was unabated. It was now chiefly referred to the right shoulder, and the upper part of the chest, sometimes shooting into the right axilla. She had also pain in the lower part of the belly, and the abdomen felt distended and tense. She had less difficulty of swallowing, and was inclined to sleep, but during sleep there was much subsultus; pulse 148 and small. On the 15th, the head was less retracted, and there was more power of moving it. The pains were abated, except in the abdomen; there was much subsultus and tremor; pulse 140; bowels open; tongue foul. She was much inclined to sleep, but quite distinct when roused. At night she was put into the warm bath, and expired in the bath. Immediately after death the muscles of the neck became entirely relaxed.

Inspection.—There was some fluid in the ventricles of the brain; and, on the posterior edge of the right lobe of the cerebellum, there was a thread of coagulable lymph. The cervical portion of the spinal cord was

healthy; the dorsal and lumbar portions were covered by a uniform thin coating of coagulable lymph of a greenish-yellow colour, and soft consistence. It was chiefly on the posterior part, betwixt the cord and its membranes, and the membranes were remarkably vascular.

Several cases have been described by Duchatelet and Martinet, of inflammation of the membranes of the cord terminating by puriform deposition, but they were in general complicated with a similar disease in the membranes of the brain. The prominent symptoms, referable to the spinal cord, were, pain extending along the spine, and tetanic contraction of the muscles of the back and neck, in some of them amounting to perfect opisthotonos. In one there was rigidity of the muscles of the left arm, with a convulsive twitching of the thumb and fingers of both hands; in another, there was a remarkable slowness of breathing, which was not above five in a minute.

Ollivier, in his second edition, has described several interesting cases, which present the same general characters. The prominent symptom was, pain referred to some part of the spine increased by motion, and sometimes little complained of except upon motion; it in general extended along some of the limbs, and was accompanied by muscular rigidity or tetanic spasms. Paralysis occurred in one case, but this seemed to depend upon a degree of ramollissement of the body of the cord. One of his cases was remarkable from the remissions of the symptoms in the first stage. There was an acute pain referred to the neck, which came on with intense severity at ten o'clock at night, and ceased at three in the morning. After seventeen days this ceased, and was succeeded by pain in the loins, which afterwards extended along the back and into the inferior extremities; and was then accompanied by muscular rigidity, and tetanic spasms of the legs, back, and neck. The patient at last died comatose; and the case seems to have gone on about five weeks. There was

extensive deposition of pus and false membrane between the membranes of the cord at various places, especially in the lumbar region, where the matter had found an outlet betwixt two of the vertebræ, and had spread under the muscles. In another case, the symptoms were, at first, more obscure. There was an expression of suffering, with retention of urine, but no defined complaint, except that the patient screamed when his lower extremities were moved, and they became paralyzed without loss of feeling. There were afterwards rigidity and partial paralysis of the arms, rigidity of the trunk, and retraction of the head; and he died in ten days. Between the membranes of the cord there was an extensive deposition of false membrane and flocculent matter, in some places four or five lines in thickness. It was most abundant on the posterior surface of the cord, and towards its lower extremity; and there was some softening of the substance of the cord.*

To these examples of this remarkable disease, I shall only add a case mentioned by Andral. A woman aged 28, after sudden cessation of the menstrual discharge, induced by mental agitation, had fever, hysterical symptoms and vomiting; about the fifth day she had retraction of the head, with severe pain extending along the whole course of the spine; it was not affected by pressure, but was increased to extreme agony by the least motion. She had afterwards difficult breathing and tetanic symptoms, followed by delirium and insensibility, and she died on the tenth day. On inspection there was found extensive deposition of purulent and flocculent matter, along the whole course of the spinal cord, which seemed to be contained chiefly in the cellular texture of the arachnoid of the cord. The membranes of the brain were deeply injected; there was membranous deposition on some parts, especially on the right side, also on the tentorium and below the cerebel-

* Ollivier, Traité de la Moelle Epinière et ses Maladies. Tome ii. 2d edit.

lum,—and there was extensive effusion of milky fluid in the ventricles.

Inflammation of the parts surrounding the spinal cord may also be excited by external injuries, without any affection of the bones of the spine. A waggoner, mentioned by Sir Charles Bell, sitting upon the shafts of his cart, was thrown off by a sudden jerk, and pitched upon the back of his neck and shoulders. He was carried to the Middlesex Hospital, where he lay for a week, without complaining of any thing except stiffness of the back part of the neck; he could move all his limbs with freedom. On the 8th day after his admission, he was seized with general convulsions and locked jaw. After a few hours, he was affected with a singular convulsive motion of the jaw, which continued in a state of violent and incessant motion for about five minutes. This was followed by maniacal delirium. He then sunk into a state resembling typhus fever, and, after four days, was found to be paralytic in his lower extremities. "He lived a week after this, but continued sinking, and still retained about him much of the character of typhus. The day before his death, he was perfectly sensible, and had recovered sensation in his legs." On dissection, a great quantity of purulent matter was found within the spinal canal, which had dropped down to the lower part of it. It appeared to have been formed about the last cervical and first dorsal vertebræ, and at that place the intervertebral cartilage was destroyed, so that the pus had escaped outwards among the muscles. In another case related by Sir Charles Bell, in which the last dorsal vertebra was fractured, purulent matter was found betwixt the spinal cord and its membranes. In this case there was no paralysis. The leading symptoms were fever, restlessness, vomiting, and high delirium; death took place from sudden sinking.*

To this place, perhaps, should be referred some notice of the appearance of increased vascularity of the

* Quarterly Reports of Cases of Surgery, part 2.

cord or its membranes, and turgidity of vessels about the origin of the nerves. It constitutes the plethora spinalis of continental writers; and much importance has been attached to it as the cause of disease in many of the principal functions of the body. By exciting irritation at the origin of the various spinal nerves, it has been considered as the source of many obscure affections of the thorax and abdomen; of tremor, convulsions, paralytic affections, chorea, epilepsy, and tetanus. It has also been regarded as the seat of many of those painful affections of the back and the loins, which take place in connexion with hæmorrhoids, menstruation, abortion, and continued fever. These writers have speculated much on the changes which take place in the thoracic and abdominal viscera, so as to throw the blood with undue impulse upon the vessels of the spinal cord. Such determinations they suppose to take place from violent colics, suppressed menstruation, diseases of the liver, and continued fever.* It must, however, be confessed, that the morbid appearances, which are referable to the head of spinal plethora, are extremely ambiguous; and there is little doubt that they are very much influenced by the position of the body after death; but it is due to the speculations of writers of high eminence, to give an example of the affections which they refer to this class.

(1.) A man who died of peripneumony, had been affected in the course of his illness with numbness and loss of feeling in the lower extremities. On dissection, the arteries of that part of the spinal cord, which is included in the dorsal vertebræ, were found turgid with blood, as if they had been highly injected.† Portal refers to several other cases, which he explains upon the same principle, and in which convulsive and paralytic affections of the extremities occurred in various inflammatory diseases.

* See Frank, Oratio de Vertebralis Columnæ in morbis dignitate, Brera della Rachialgite, and Ludwig de Dolore ad Spinam Dorsi.

† Portal, Cours d'Anatomie Medicale, tom. iii. page 219.

(2.) An infant was attacked during dentition with convulsions, which degenerated into epileptic fits. When he was five years and a half old, he had four or five fits every day, and became paralytic; he died at six years and a half. The spinal sheath appeared as if injected, and the medullary substance was softened and of yellowish colour about the 6th and 12th dorsal vertebræ.*

(3.) A young man aged twenty-one, was affected with fever and high delirium. When the delirium subsided, he had convulsive motions of the superior extremities, and soon after died comatose. On dissection, the vessels of the pia mater of the spinal cord, at its upper and posterior part, were found distended with blood, as if they had been highly injected. This was especially remarkable about the origin of some of the spinal nerves. There was a similar appearance on the pia mater of the brain, and some effusion on its surface.†

SECTION II.

INFLAMMATION OF THE SUBSTANCE OF THE SPINAL CORD.

In referring to inflammation of the substance of the cord, the appearances to be described under this section, I am guided by the analogy of the corresponding affections of the brain. I allude more particularly to the ramollissement, which seems to be one of the most common morbid appearances in the acute affections of

* Esquirol Bulletin de la Faculté de Medecine.
† Morgagni, Ep. x.

the spinal cord, and which, in reference to the brain, I think has been distinctly traced to be a result of inflammation. I again leave this doctrine, however, to the judgment of the reader, and shall make no farther use of it here, than as a ground of arrangement. This important subject has not yet been investigated with that attention which it merits; but there is reason to believe, that inflammation of the substance of the cord, like the corresponding affection of the brain, may terminate fatally in four different forms:

I. In the inflammatory stage.
II. By ramollissement.
III. By undefined suppuration.
IV. By abscess.

§ I.—Inflammation of the substance of the cord fatal in the inflammatory stage with incipient ramollissement.

This part of the subject is obscure, and the termination of the disease in the inflammatory stage may perhaps be considered as not ascertained. It may, therefore, be doubted whether the following case can properly be referred to this head;—it is the one most nearly allied to it, that I find on record.

A woman had long been subject to a convulsive affection in the left lower extremity, immediately before the appearances of the menses; this occurred at every period; when the discharge took place freely, it ceased. After the cessation of the menses, which happened at the age of 40, this extremity became paralytic. After some time she was affected with convulsions of the left arm, and soon after died comatose. On dissection, the membranes of the spinal cord were found in a state of inflammation at some of the last dorsal vertebræ. The cord itself was very red and softened on the right side; on the left it was sound through its whole extent.*

* Portal, Cours d'Anatomie Medicale, tome iv. page 116.

Lieutaud refers to a case described by Lælius a Fonte, in which death happened on the 14th day of continued fever, after paraplegia and suppression of urine; "in conspectum venit ren sinister, inflammatus et syderatus; læsa etiam erat medulla spinalis in eodem latere."

§ II.—Ramollissement of the cord.

This remarkable affection will be illustrated by the following important cases. In the first it was complicated with extensive inflammation of the membranes; the second shows the disease confined to the body of the cord; and the third is chiefly remarkable from its resemblance in the symptoms to an affection of the brain. The fourth shows the affection arising from an injury; and the fifth affords a very interesting example of the disease in a chronic form.

Case CXLIII.—A gentleman, aged 18, of an unhealthy constitution, had suffered for several years from ulcers in various parts of his body, accompanied by exfoliation of bone, especially from the leg, thigh, and sacrum. For several months before the fatal attack, he had a sore on his head with caries of the bone beneath, to the extent of a shilling or upwards. But he was in good general health, and was pursuing his studies at the University of Edinburgh, when, on the 24th September, 1823, he consulted my friend Dr. Hunter, on account of sore throat with slight fever, which passed off in two days; and, on the three following days, he was going about in his usual health. On the 30th, he was again confined to the house, and complained of pain in his loins without fever. On the 2d of October, this pain had increased; it was chiefly seated among the lower dorsal vertebræ, and extended downwards in the course of the ureters, with frequent desire to pass urine. On the 3d, the urinary symptoms were gone, the pain was diminished in violence, and it was lower down, being now chiefly referred to the sacrum. On the 4th,

he continued in the same state; he was entirely free from fever; the pain in the back was by no means severe, but as it was not removed, a blister was applied to it.

(5th,) The pain of the back was removed, but he complained of pain of the belly, especially about the pubis; there was some dysuria, and a feeling of numbness on the inner side of both thighs. At night there was retention of urine requiring the catheter.

(6th,) The numbness of the thighs was increased, with acute darting pains occasionally shooting along them, and complete retention of urine.

(7th,) Perfect paraplegia of both thighs and legs without loss of feeling; retention of urine, and involuntary stools. The most judicious treatment had been employed without any benefit.

(8th,) I saw him for the first time along with Dr. Hunter. There was now perfect paraplegia and complete retention of urine; pulse about 90 and soft. There was some pain, which was referred to the lower part of the dorsal region; there was no other symptom. Cupping on the back was employed, followed by another large blister, &c.

(9th, 10th, and 11th,) There was no change, except that the pulse was becoming a little frequent. His mind was entire. Some pain of the back was at times mentioned, but it was not severe, and he made no other complaint. Perfect palsy of the limbs continued, and the numbness was extending upwards upon the abdomen.

(12th,) The numbness was extending upon the thorax; there was very little complaint of the back, but acute darting pains were complained of extending along both arms. The sore on the head being examined, and the opening enlarged, the bone was found carious, and some matter was discharged from it by a very small opening. In consequence of this appearance, a perforation was made by a small head of a trephine, but no disease was found beneath the bone. In the evening, his pulse

having become more frequent, farther bleeding was employed with relief.

(13th,) No change; his mind was quite entire, and he made no complaint of anything; stools involuntary.

(14th,) The urine came off without the catheter, on raising him up into an erect posture. Pulse frequent and feeble; strength sinking. He died in the night, having continued quite sensible until about six hours before his death. There never had been the least attempt at motion of the lower extremities, but the sensibility remained.

Inspection.—In the brain all was quite sound, except some old thickening of the dura mater in the neighbourhood of the diseased bone. The bone was carious and very thin to the extent of a half-crown piece; around this portion it was thickened, especially on one side, where it was fully double the natural thickness. There was no effusion in the head, and no appearance of any recent disease.

In opening the spinal canal some purulent matter flowed out during the sawing, from about the middle of the dorsal region; and one of the vertebræ at that place was found considerably carious. The canal being opened, there was found most extensive deposition of flocculent matter, of a purulent appearance, on the outside of the membranes of the cord; it was most abundant for some inches about the lower part of the dorsal region, but likewise extended upwards to the fourth cervical vertebra. The dura mater of the cord being laid open, bloody sanious fluid was discharged from beneath it; and the pia mater was found highly vascular. The substance of the cord was found most extensively destroyed in its structure along nearly the whole extent of the dorsal portion. The anterior columns of this part were completely disorganized and broken down into a soft diffluent pulp; on the posterior part, the cord was more entire. When the whole cord was taken out and suspended, it hung together by

the posterior columns of the dorsal portion, while the anterior part of it fell off entirely in a soft diffluent state. The parts above and below the diseased portion were quite firm and healthy.

Case CXLIV.—A man, aged 56, in the last week of March, 1823, was much exposed to cold in travelling on the outside of a coach, after which he was seized with pain of the right arm and leg, most severe about the shoulder, but affecting the whole side; and there was also considerable headach. He soon perceived some loss of power of the affected limbs, which began at the upper part of the arm, and extended downwards so gradually, that he was able to write distinctly, after he had lost the power of raising the arm or bending the elbow. The leg then became affected in the same gradual manner, and after about ten or twelve days from the commencement of the disease, the whole leg and arm had become completely paralytic. Some pain continued in the parts, and was sometimes severe, especially in the leg. About this time he was first seen by Dr. Moncrieff, who found the pulse 96, and rather sharp. He was quite sensible and still complained of some headach, and of pain extending from the shoulder along the affected arm and leg. Repeated bloodletting, blistering, purgatives, &c., were employed, and the headach was removed. The other symptoms continued as before; the right leg and arm were completely paralytic, and sometimes very painful; pulse 84, and rather weak; his mind quite entire. He continued in this state till about the 26th of April, when the left arm became paralytic rather suddenly; it did not however become so completely motionless as the limbs of the right side, and the left leg was not at all affected. The pulse was now feeble, and his general appearance expressive of exhaustion. I saw him first about this time. There was slight delirium, which however passed off again; and he continued quite sensible and even cheerful, without any pain, except occasionally in the right leg, till the 7th of May, when he became again delirious; the pulse

120, and weak. On the 8th, he lay in a state of stupor, muttering incoherently, but answering questions distinctly when he was roused. He died on the morning of the 9th, having lost his speech a few hours before death. For the last eight or ten days there had been extensive gangrene on the sacrum.

Inspection.—Every part of the brain was found in the most healthy state. Much bloody fluid was discharged from the spinal canal into the cavity of the cranium before the spine was laid open. On laying open the spinal canal, the cord was found in a state of complete ramollissement, from the second to the last cervical vertebra; the parts above and below were quite healthy.

The following case shows the disease running its course with much greater rapidity, and with a different train of symptoms.

Case CXLV.—A boy, aged 7, had been indisposed from the 18th to the 20th of May, 1823, but so as to attract little notice. There had been some headach and slight feverishness, for which he took purgative medicine, and on the morning of the 22d he seemed almost well. About two o'clock in the afternoon of that day, he was seized with severe and general convulsions. I saw him soon after this, and found him confused, incoherent, and partially comatose; the pulse 60 and weak; face pale; the bowels were slow, and some worms had been passed. The usual remedies were employed with little effect.

(23,) In the morning he was partially comatose, the eye fixed and insensible. In the course of the day he became less comatose, but incoherent, with much talking and screaming; complained of headach, and was impatient of light. In the evening there was slight appearance of squinting, and in the night some convulsions; pulse very variable, being sometimes rapid, and sometimes slow: the bowels were very obstinate, but yielded to repeated doses of croton oil.

(24th,) Seemed much better,—eye natural, face pale,

pulse 120, bowels kept open by the croton oil. He was quite sensible, and said there was still some headach, but did not appear to suffer: he continued in this favourable state until early in the morning of the 25th, when the convulsions returned with much severity, after which he sunk into a low oppressed state, and died early in the afternoon.

Inspection.—There was no effusion, and no appearance of disease in the brain. On removing the brain, a considerable quantity of fluid flowed from the spinal canal; and on laying open the canal there was still a good deal found between the cord and the external membrane. The cord was healthy at the cervical portion, but in the upper part of the dorsal region it was remarkably softened and broken down. This appearance extended for several inches, but varied in degree. At one place a complete separation took place in attempting to raise the cord, the part falling down into a soft diffluent pulp through its whole diameter. From the middle of the dorsal portion it was quite firm and healthy. The inner membrane of the cord was dark-coloured, highly vascular, and showed evident marks of inflammation, at the part corresponding with the softened portion of the cord.

The following case (for which I am indebted to Dr. Hunter) shows this affection arising from an external injury, without any affection of the bones of the spine.

Case CXLVI.—A man, aged 36, in August 1827, was thrown from the top of a waggon, a height of about ten feet. He alighted upon a pile of small stones, in such a manner, that the shock, on first coming in contact with the top of the pile, was received on his back, between the shoulders. He attempted immediately to get up, but fell instantly from complete loss of power of the lower extremities; and very soon after, he had involuntary discharge of urine and fæces. He was conveyed home in this state, but little appears to have been done for him except the application of sinapisms; and

it was about a month after the accident, when he was received into the Infirmary of Edinburgh under the care of Dr. Hunter. He was then considerably emaciated, and there was complete loss of motion of the lower extremities, without loss of feeling, and all the muscles of the affected parts were in a remarkable state of flaccidity. He complained of deep seated pain on pressure of the region of the third, fourth, and fifth dorsal vertebræ. He had liquid stools, which were discharged involuntarily. His urine was at first discharged involuntarily, mixed with much viscid mucus; afterwards it became obstructed, apparently from the viscidity of the mucus impeding the passage, and he then required the catheter. His breathing was very slow, being generally, when he was asleep, about nine in a minute; and when awake about thirteen. His pulse and other functions were natural; his appetite was moderate, and his digestion good; his mind was quite entire. On the third day after his admission, he began to complain of pain in the temporal and masseter muscles, with inability to open the jaw; and this rapidly increased to perfect trismus. He then had emprosthotonos, and the usual tetanic symptoms; the abdominal muscles being very tense and hard, and the body considerably bent forward. On the following day more general spasms took place, affecting the arms and face, and the muscles about the neck and throat, with great difficulty of swallowing. The spasms now assumed the form of opisthotonos. He died in the night, about forty-eight hours after the first appearance of the trismus. All the usual remedies had been employed in the most active and judicious manner without benefit.

Inspection.—No injury could be detected in any of the bones of the spine. There was a high degree of vascularity of the pia mater of the cord, especially at the upper part of the dorsal region. There was most extensive ramollissement of the body of the cord, which affected chiefly the anterior columns. These were most remarkably softened throughout almost the whole course of the cord, in many places entirely diffluent, and the

softening was traced quite to the upper part of the cord, and affected the corpora pyramidalia. The posterior columns were also softened in many places, though in a much smaller degree, not diffluent like the anterior, but breaking down under very slight pressure.

A remarkable modification of the disease occurs, in which, although it is seated in the upper part of the cord, the symptoms appear only in the superior extremities and adjoining organs, without any affection of the lower parts of the body. A gentleman mentioned by Ollivier, who was liable to epilepsy, complained first of uneasiness in the throat, with difficulty of swallowing, accompanied by an acute pain in the nape of the neck, and lower part of the occiput, and speedily followed by fever, difficult breathing and vomiting. He then had numbness of the left hand, which rapidly extended along the arm; the right was immediately after affected in the same manner, and on the following day they were both paralytic. His legs were not in the least affected, nor the functions of the bladder or the bowels. There was at last increase of dyspnœa with extreme difficulty of swallowing, while nothing could be seen in the throat, and he died on the eighth day, having preserved his intellects to the last. There was extensive ramollissement of the upper part of the cord, chiefly seated in the grey matter, which was of a rose-colour, with a highly vascular state of the membranes connected with the part; there was extensive effusion in the spinal canal, and some extravasated blood in the cellular tissue between the vertebræ and the dura mater of the cord. The lungs were dense and loaded with blood, and there was increased vascularity of the bronchial membrane. In another case, with extensive ramollissement at the upper part of the cervical portion, there was palsy of all the extremities. The only difference in the morbid appearances, betwixt the two cases, seems to have been, that the ramollissement in the former was chiefly seated in the grey matter, while in the latter it extended nearly through the whole thickness of

the cord. Ollivier has also described several cases which followed a course similar to Case CXLV. being fatal in about three days, with violent convulsion without paralysis.

The disease occurs in a more chronic form, in which it may go on for a considerable time, sometimes for years, before it is fatal. There is generally in these cases some uneasiness in the back, with paralytic symptoms, beginning in a part of a limb, and in a slight degree, and advancing very gradually to confirmed palsy. The lower extremities are most commonly affected, but in some cases the arms only, and in others all the limbs. There is sometimes permanent contraction of the affected limbs, and sometimes there are spasmodic affections of them; and the disease may go on in this manner for years, and at last be fatal by ramollissement.

This form will be illustrated by the following case, which I saw along with Dr. Alison.

Case CXLVII.—A gentleman, aged 42, in October, 1827, began to be affected with pain in the lower part of the back, stretching round the abdomen, and frequently shooting into the groins. After a short time this was succeeded by coldness and numbness of his feet, which gradually extended upwards with diminished power of motion, until, after several weeks, it terminated in perfect loss of motion of both lower extremities, with retention of urine. There was pain in some parts of the affected limbs, and in others a painful sensation of cold. This perfect loss of power continued five or six weeks, when after a great deal of treatment by cupping, blistering, &c. he recovered a slight degree of motion, but no power of the bladder. He then began to be affected with spasms of the muscles of the back and abdomen, with a very uneasy sensation of tightness across the abdomen, and at times across the lower part of the thorax. The spasms occasionally assumed the characters of opisthotonos, and at one time he had almost incessant hiccup, which continued in a most violent degree

for several days. After the employment of various antispasmodics, this subsided under the use of musk. During the course of these symptoms he frequently complained of pain in various parts of the spine, at first in the lower part, and afterwards higher up; and the feeling of numbness extended gradually upwards, till it reached nearly the upper part of the dorsal region, and was felt in a very considerable degree along the sides of the thorax.

After this he became liable to feverish attacks at night, terminating in the morning by very profuse perspiration, but this was strictly confined to the parts which were not palsied, and there never was the smallest moisture on the lower extremities. He had also, in the upper extremities, a frequent feeling of intense heat, while the lower continued cold and benumbed. During this time a considerable, but very imperfect, degree of motion continued in the lower extremities, but the bladder continued entirely paralytic.

In April, 1828, he went to the country, and at this time he had such a degree of motion as to walk a little on a smooth garden-walk, leaning on two persons, or supported by crutches. But soon after this he began to complain of pain in the head. It occurred in irregular paroxysms, and was often referred to a small defined spot, on various parts, especially behind the ear, and sometimes to the tip of the ear. This pain seemed to abate under the use of arsenic; but soon returned, and became more fixed and permanent, and the palsy of the limbs again increased. After an absence of about two months, he returned to town in the beginning of July. At this time the headach was severe, and the power of the limbs so much impaired, that he was entirely confined to bed. In a few days after his return, the right arm became paralytic, and his speech considerably impaired. After a day or two, these symptoms rather subsided, but in the following night he became comatose and died in the afternoon. There never was complete loss of sensation of the affected limbs; he had

only complained of it occasionally at particular spots, and of a general feeling of numbness and coldness.

Inspection.—There were some scales of bone attached loosely to the inner surface of the dura mater of the spinal cord. The whole cord was of a pale rose-colour, and in a state of complete ramollissement through its whole extent, being in every part entirely diffluent. The medulla oblongata was tolerably healthy, except a slight degree of softening on its anterior part; and there was also a degree of softening on the tuber annulare, which seemed to involve the origin of the fifth nerve. Beyond this, the ramollissement became again more decided, extending along the crura cerebri and cerebelli, and considerably into the substance of the brain, at the part adjoining the crura. The brain, in other respects, was healthy, and there was no effusion in the ventricles.

It is difficult to trace the precise nature and progress of the affection of the cord, when the disease advances in so gradual a manner as in this case, and terminates in disorganization so complete and extensive. In tracing the history of the analogous disease of the brain, we found reason to believe, that it is originally an inflammatory affection of a low chronic character, seated in a small part of the cerebral substance; that it may continue for a considerable time in the state of simple inflammation, and then subside; or that it may terminate by a permanent change in the structure of the part, generally with some degree of induration. In this state we find it when the patient dies of another disease, as in Case CXXXV. When it is itself the fatal disease, it seems to be so by passing either into ramollissement, or into partial and unhealthy suppuration. It is proble that the same character of disease takes place in the spinal cord; and it is found, in the same manner, sometimes in a state of ramollissement, sometimes in the state of induration, and sometimes one part is found indurated and another softened. In a remarkable case communicated to Ollivier by Andral, the affection be-

gan with numbness of the fore-finger of the left hand, which gradually extended over the hand and arm. After some time the other hand and arm became affected in the same manner, and, after a year, the lower extremities. All the limbs then became paralytic, with permanent contraction, but without loss of feeling. The legs were bent upon the thighs, and the thighs upon the abdomen, and the arms rigidly fixed across the thorax, with the points of the fingers pressed against the palms of the hands. If attempts were made to move the limbs from these positions, they were thrown into spasmodic contractions with much pain. The patient died in this state at the end of eight years from the commencement of the disease. Along nearly the whole length of the cord, there was a central cavity full of a soft grey mucus. It was considered as arising from ramollissement of the grey central matter of the cord, and the parietes of the cavity were formed by the white matter in a healthy state. In a case by Ollivier, in which palsy took place in the same gradual manner, but affected only the lower extremities, the patient was confined to bed for seven years. His legs were drawn up upon his body, and were entirely motionless, but preserved their feeling. There was extensive ramollissement of the anterior pillars of the cord: and a very remarkable circumstance was, that the softening was greatest in the upper parts of the cord, the corpora pyramidalia, and several parts of the brain, and became less towards the lumbar portion. The intellectual faculties had been almost entirely obliterated, but the motion of his arms continued entire to the last. Such are the difficulties and obscurities of this interesting subject.

A different course of symptoms occurs in a remarkable case described by M. Rullier.* A gentleman, aged 44, who had slight curvature of the spine at the upper part, was seized with pain in the curved portion, which, after several remissions, increased rapidly, and was followed by sudden and complete palsy of both his arms. They became rigid, contracted, and entirely motionless,

* Journal de Physiologie, 1823.

and the points of the fingers were forced against the palms of the hands. The sensibility of the parts was not impaired, and the lower extremities were not in the least affected, for the patient could walk about without difficulty. He lived six years in this state, and died of pectoral complaints. A portion of the cord, six inches in length, occupying two-thirds of the cervical portion, and part of the dorsal, was entirely diffluent, so that before the membranes were opened, it moved upwards and downwards like a fluid. The posterior roots of the nerves of this portion preserved their nervous matter, to their junction with the membranes of the cord, but in the anterior roots it was destroyed, and they were reduced to an empty neurilema. Several other cases are mentioned in the same journal, intended to show the separate origin of the nerves of sensation and motion from the different parts of the cord. In one case, there was loss of power of the whole body without loss of sensibility, and the disease was in the anterior part of the cord. In another, there was complete palsy of the legs, and partial palsy of the arms, while the sensibility was everywhere morbidly increased. The medullary matter of the cord was singularly contracted in volume. The anterior part of its upper half was of a reddish-brown colour, and as it were macerated; the roots of the nerves inserted there were so wasted as to be scarcely discernible, while the posterior roots were preternaturally large.

A case mentioned by Ollivier seems to establish the inflammatory origin of the ramollissement of the cord, and at the same time shows the insidious and dangerous nature of injuries of the spine. A man having suffered an injury of the spine by a fall, ten months after the accident had prickling of the left lower extremity, which ceased after a month, leaving it paralytic. The right lower extremity became affected in the same manner; and some projection of the vertebræ at the affected part was then first observed. He had afterwards convulsive motions of the limbs, and died about a month after the appearance of the palsy. On dissection there was found false membrane of an inch in extent, with purulent matter, betwixt the bone and the membranes of the cord at the

affected part; and the portion of the cord included in the diseased membrane was entirely diffluent like cream. Above and below this portion, the cord was of a natural consistence, but highly injected, and of a deep red colour, especially below the softened part, where the redness was intense.

I shall conclude this part of the subject with the following very remarkable case, for which I am indebted to Dr. Molison. I did not see the patient during his life, but was present at the latter part of the inspection of the body, when the spinal cord was examined. I shall simply relate the case, without entering upon any of the very interesting reflections which might naturally arise from it.

Case CXLVIII.—A street porter, aged 37, since February, 1827, had frequently complained of pain in his back, and in both sides of the thorax, with difficulty of breathing when making any great exertion. For a month before his death the pain of his back had been more severe, and he had great difficulty of swallowing. His general health, however, was very little impaired; and on Monday, 15th July, he carried a burden to Newhaven, three miles from Edinburgh, and afterwards went into the sea to bathe. While he was in the sea, as he afterwards stated, he became very confused, and, on attempting to come out, fell among stones. When he was taken up, he was bleeding profusely at the nose and mouth; and, after he was carried to an adjoining house, he vomited blood in large quantities. Through the following night he was restless and partially insensible, and talked incoherently; he had several attacks which were represented as convulsive, in which his eyes became fixed, and there was much tremulous motion in his legs, but without any motion in his arms, which appear to have become paralytic at an early period of the attack. On the 16th, he was first seen by Dr. Molison: immediately before his visit, he had brought up a large quantity of blood, which ran from his mouth

in a full stream, and then coagulated. He was somewhat lethargic, but distinct when roused; and complained of pain in his head, chest, and bowels. His head and his legs were in almost constant motion, but his arms were paralytic, being entirely deprived both of motion and feeling. His breathing was easy; his pulse frequent and small; countenance pale and anxious; and he had involuntary discharge of urine. In the evening, he again vomited blood in considerable quantities. (17th,) There was little change, except that he recovered the power of the bladder; perfect palsy of the arms continued, but his legs were in almost constant motion. There was no return of the vomiting of blood through the day; at night he fell asleep, and slept quietly for some hours, when he awoke quite sensible; but soon after, was seized with vomiting of blood to a great extent, and died almost immediately.

Inspection.—The heart and lungs were healthy; the stomach contained a very large and firm mass of coagulated blood, which entirely filled it, and extended into the duodenum. In the descending aorta, about the 4th and 5th dorsal vertebræ, there was an aneurism the size of an orange, which had burst into the œsophagus by a large opening. The 3d, 4th, and 5th dorsal vertebræ were extensively carious in their bodies, where the substance was destroyed to the depth of a quarter of an inch. On opening the spinal canal, some bloody albuminous-looking matter was found between the bone and the dura mater of the cord, and between the dura and pia mater of the cord, there was a considerable quantity of a tenacious sanious bloody matter, which covered the surface of the pia mater, from about the 2d or 3d to the last dorsal vertebra. The substance of the cord, from about the 3d to the last dorsal vertebra, was of a yellowish colour, and in a state of extensive ramollissement, especially about the centre of this space, where it was entirely diffluent. On removing the cord, the anterior part of the spinal canal, viewed from behind, presented several places where the bones were

denuded of their covering and carious This was most remarkable about the 3d, 4th, and 5th dorsal vertebræ.

§ III.—Undefined suppuration of the cord.

It may perhaps be doubted, whether some of the cases which I have referred to this head, ought not rather to be referable to the ramollissement. These two morbid conditions were not accurately discriminated till lately: but in the brain there seems every reason to believe that they are entirely distinct; and it is probable that they may likewise be so in the cord.

1. A woman, aged 23, who had suffered considerably from syphilis, was seized with severe quotidian intermittent, which proved very tedious, and resisted all the usual remedies. After some time, it was accompanied by pain in the lumbar region, diarrhœa, tormina, tenesmus, general debility, and emaciation. About three months after the commencement of the fever, she began to be affected with weakness and convulsive motions of the left lower extremity, resembling chorea. In walking, the leg was dragged, and, if she attempted, by a strong effort, a greater degree of motion, it was thrown into convulsive distortions. Soon after, the left arm became affected in the same manner, and there were also convulsive motions of the face and eyes. The complaint in the bowels now ceased, but the other symptoms increased, and the affection of the limbs soon amounted to nearly complete paralysis. She was then affected with difficulty of articulation, and diminution of memory; and these soon terminated in loss of speech, coma, and death, which was preceded by general and terrible convulsions. Her death happened rather more than a month after the commencement of the convulsive affection of the leg. On dissection, some serous effusion was found in the thorax, and in the ventricles of the brain. The spinal cord was soft and flaccid, and to a considerable extent suppurated. Its investing membrane was in many places covered by a puriform

fluid; and there was also serous effusion in the spinal canal.*

2. A young soldier, who had lately recovered from a petechial fever, was affected with pain in the dorsal vertebræ, difficulty of moving the lower extremities, retention of urine, involuntary discharge of feces, general debility and emaciation. A variety of treatment was employed for several months without relief. The weakness of the lower extremities increased to perfect paralysis; and, soon after, the superior extremities became affected in the same manner. He then lost his speech, and, after lying a fortnight in this state, completely immoveable and speechless, but in possession of his intellectual faculties, he died suddenly. On inspection, there was found no trace of disease in the brain, the thorax, or the abdomen. The spinal canal was inundated by a large quantity of sanious fluid. The cord itself was suppurated, dissolved, and disorganized, at the lower part of the dorsal region; above this, it preserved its figure, but was very soft. Its investing membranes, and the periosteum lining the canal of the vertebræ, were destroyed at the part where the cord was so much diseased; but the vertebræ and their ligaments were sound.*

3. A man, aged 40, was received into the hospital of Crema, in the spring of 1804, with no other complaint than general weakness and depression, for which no cause could be assigned. He lay constantly in bed, but did not complain of any pain; his appetite was good; and he was free from fever. From being lean and pale, he became so fat and ruddy that suspicions were entertained that he was feigning; but as winter approached, he became lean and cachectic. In February, 1805, he became completely paralytic, both in his legs and arms; and he died suddenly in March. On inspection all was sound in the head, the thorax, and the abdomen. In the spinal canal there was

* Brera Della Rachialgite, cenni patalogici. In Atti dell' Accad. Ital. tom. i.

much effusion of bloody sanious fluid, with marks of inflammation and suppuration in the spinal cord, the substance of which was remarkably soft, and tending to dissolution.*

§ IV.—Abscess of the cord.

A woman, aged 56, was affected with sudden loss of power of the limbs of the left side, without loss of feeling. It soon amounted to perfect palsy; her voice became feeble, and her speech embarrassed; pulse natural; respiration quick. The left arm became œdematous. After four days the speech could not be understood; pulse feeble; increasing debility; stertorous breathing; and she died in a week.

Inspection.—The brain was sound, but the pia mater was injected. In the centre of the right column of the spinal cord, in the middle of the cervical portion, there was a cavity three inches long, and two or three lines in diameter. It was full of a soft matter like pus, which became more consistent towards the parietes of the cavity. It seemed to be the grey substance of the cord converted into pus. The parietes of the cavity were firm, and about a line and a half in thickness, and were formed by the healthy white matter. In the left column of the same portion of the cord there was a similar disease, but less extensive, being about one inch long, and one line in diameter; and its contents were less purulent, rather resembling ramollissement of the substance of the cord. The membranes of the cord were hardened at the part, and also at a part in the dorsal region.†

* Brera, *ut supra.*

† Velpeau Revue Medicale, 1826.

SECTION III.

SEROUS EFFUSION IN THE SPINAL CANAL.

I PLACE this appearance by itself, abstaining from any hypothetical speculations in regard to the origin of it. I have already alluded to the ambiguity which attends serous effusion when it occurs between the dura mater and the inner membrane of the cord, on account of the free communication which this space has with the cavity of the cranium, or at least with the cellular texture of the arachnoid of the brain. When the effusion is contained in the cavity formed between the dura mater and the canal of the vertebræ, there can be no doubt of its connexion with disease of the spinal canal.

The following is the most distinctly marked case of this affection that has occurred to me.

CASE CXLIX.—A strong healthy child, aged nearly 2 years, after having been oppressed and feverish for two days, was seized with violent convulsion. The first fit continued about an hour, and left her comatose with distortion of the eyes. She had not recovered out of this state when she had another attack of convulsion, about two hours after the first. During the fits and for some time after them, there was violent and irregular action of the heart, and a peculiar spasmodic action of the diaphragm. The second fit left her in a state of coma from which she never recovered. She took food or medicine when they were put into her mouth, but showed no other appearance of sensibility. The eye was completely insensible, and the pulse very frequent. She had afterwards several slight attacks of convulsion, and one more severe a short time before death, which happened thirty-three hours after the first attack.

Inspection.—No disease could be detected in the brain, except some appearance of increased vascularity, and slight effusion under the arachnoid. The brain and cerebellum being removed, there was a copious discharge of bloody fluid from the spinal canal. The canal being laid open, there was found a copious deposition of colourless fluid, of a gelatinous appearance, betwixt the canal of the vertebræ and the dura mater of the cord. It was most abundant in the cervical and upper part of the dorsal regions. Between the membranes of the cord there remained a small quantity of the bloody fluid which had flowed into the cavity of the cranium. The substance of the cord, at the upper part, seemed softer than natural, and very easily torn. All the viscera of the thorax and abdomen were perfectly healthy. The foramen ovale was pervious by a small opening.

The effusion on the outside of the dura mater, in this case, was fairly to be considered as a distinct disease of the spinal canal; but the other effusion between the membranes, though somewhat more ambiguous, is not to be overlooked, especially if we should find that this fluid is bloody, while the effusion under the arachnoid of the brain is colourless.

In a child, aged between 3 and 4 years, mentioned by Ollivier, who died with symptoms of opisthotonos, difficult deglutition, and coma, he found deposition of a red and very consistent fluid, in the cellular texture between the dura mater of the cord and the canal of the vertebræ in the dorsal region, serosity within the membranes, and the arachnoid of the cord covered with an albuminous concretion for four inches.

The following cases are given by the eminent writers whose names are annexed to them, as examples of diseases depending upon serous effusion within the spinal canal.

1. Morgagni mentions a man, aged 40, who was affected with acute pain and weight in the lower dorsal

vertebræ, the pain occasionally extending upwards or downwards to the top and bottom of the spine. After eleven days he was seized with paralysis of the right lower extremity, and in three days more with retention of urine. The pain was now so acute as to prevent him from lying down, and was soon after accompanied by dyspnœa, vomiting, and tonic convulsions of the trunk and arms, which recurred at intervals, and continued for about fifteen minutes. The left inferior extremity then became paralytic, and he died suddenly; his intellectual faculties had continued entire, except during the paroxysms of convulsion. On inspection much fluid was found in the cavity of the spine, but the cord was sound; there was also fluid on the surface of the brain, but none in the ventricles.*

2. A child, aged 12 months, whose case is briefly related by Mr. Chevalier, after appearing to be in much pain, lost the use of the inferior extremities, and died in three days. The spinal canal was found full of bloody serum.†

3. Bonetus mentions a young woman who, after suffering severely from cholic, fell into paralysis. It began at the upper part of the arms, and extended gradually to the points of the fingers. Afterwards the legs became affected, and she died of gradual exhaustion a year after the first appearance of paralysis. Through the whole extent of the spinal cord, there was a space betwixt its dura and pia mater, full of serous fluid. There was also some effusion on the brain.‡

4. A man mentioned by Portal had numbness of the inferior extremities, followed by paralysis of them, and extensive œdema. After some time the arms became affected in the same manner, and the œdema extended over the whole body. He died comatose. On inspection much fluid was found both in the brain and in the spinal canal. In the centre of the spinal cord there was a

* Morgagni de Causis et Sedibus, &c. Epis. 10. Sect. 13.
† Med. Chir. Trans. vol. iii.
‡ Boneti Sepulchretum Anatomicum, tom. i.

canal into which a large writing quill could be introduced. It was full of serous fluid, and extended as far as the third dorsal vertebra.

SECTION IV.

SPINAL APOPLEXY, OR EXTRAVASATION OF BLOOD IN THE SPINAL CANAL.

Case CL.—A child, aged 7 days, 1st September, 1818, was observed not to suck, and appeared as if he were prevented by something which impeded the motion of his tongue. Through the following day he cried frequently, and still did not suck; in the evening he was seen by Mr. White, who found the jaw clenched by spasm, but by very little force it could be opened. On the third day he was seized with convulsion, which recurred at various intervals, sometimes in the form of tonic spasm of the whole body, and sometimes of violent convulsive agitation. On the fourth the convulsion continued, and he died in the afternoon.

Inspection.—No disease could be detected in the brain. In the spinal canal, there was found a long and very firm coagulum of blood, lying between the bones and the membranes of the cord on the posterior part, and extending the whole length of the cervical portion.

This is the only case that has occurred to me of this remarkable affection; but as it appears to be uncommon, and to present some very interesting phenomena, I am induced to add the following examples.

1. A lady, aged 40, had headach and pain of the back; after a few days the pain of the back became very acute, and violent convulsion took place, which was fatal, after continuing five or six hours. All was

sound in the brain, but extensive extravasation of blood was found in the spinal canal, which was most abundant about the seat of the pain.*

2. A gentleman, aged 61, had just arrived in Paris from a long journey, when he complained of pain of his back, extending from the cervical vertebræ quite to the sacrum. After a few hours he was seized with paraplegia, and incontinence of urine and feces; and he died while the physician was talking to him, who had been sent for on the occurrence of the palsy. There was extensive extravasation of blood in the spinal canal, under the membranes of the cord. At the lower part it formed a mass like a bouillie of bullock's blood, in which the substance of the cord could not be distinguished, as far as the third dorsal vertebra; and above this, where the cord was entire, it was of a deep red colour, and very soft.†

3. A young lady, aged 14, had headach and pain in the back, with a tendency to sickness on sitting up. At the end of a week there was a sudden and violent aggravation of this pain, followed by general convulsions, which were fatal in five or six hours. The spinal canal was found filled with extravasated blood, in the lumbar region, which had been the seat of the pain. The brain and all the other viscera were sound.‡

4. A miller, in lifting a heavy sack, suddenly lost the use of his lower extremities, and died in fifteen days. Extravasated blood was found, mixed with sanious matter, in the spinal canal. The membranes were inflamed, and the nerves of the cauda equina appeared rotten, as if they had been long macerated in putrid water.‖

5. A gentleman died of a disease which was considered as apoplectic, but in which he retained his men-

* Ollivier, *ut supra.*
† M. Gaultier de Claubry, Jour. Gen. de Med. 1808.
‡ Chevalier Med. Chir. Trans. vol. iii.
‖ Chevalier, *ut supra.*

tal faculties to the last. No disease was discovered in the brain, but there was a great quantity of extravasated blood in the spinal canal.*

6. A man received a violent blow on the three inferior lumbar vertebræ, by a log of wood which fell upon him; he died in four hours. Extravasated blood was found in the spinal canal, but the vertebræ were entire and the cord was healthy.†

7. A boy, aged 14, received a violent jerk of his neck by a cord which was thrown over his head as he was swinging forward in a swing. He felt no bad effect at the time, but after some time, became inactive and weak in the limbs, with stiffness of the neck, and difficulty in moving his head. Nine months after the accident the weakness of his limbs increased to paraplegia; and soon after he had paralysis of the arms, with retention of urine. He had been a short time in this state when he was seized with violent pain in the spine; he then had difficult and quick breathing, which was first observed during sleep, but afterwards continued while he was awake; and he died after suffering severely from it for two days. His death happened about ten months from the injury, and a few days after the violent attack of pain in the spine. A large quantity of extravasated blood was found in the spinal canal, betwixt the bone and the theca vertebralis. It was partly coagulated, and partly fluid, and appeared to have come from the upper part of the canal about the second or third cervical vertebra.‡

The following very remarkable case is mentioned by Dr. Bright, and was communicated to him by Dr. Stroud. It affords the only example that I find on record of the regular apoplectic cyst connected with the cord, analogous to that affection as it is found in the brain.

* Du Hamel, Reg. Scient. Acad. Histor. An. 1683. Sec. 5, cap. 2, p. 264.

† Morgagni, Epis. 54.

‡ Howship's Observ. in Surgery and Morbid Anatomy, p. 115.

A gentleman, aged 48, who had suffered long and severely from rheumatism, about a year before his death had an attack of hemiplegia, from the effects of which he never entirely recovered. The palsy, which at first was hemiplegia of the left side, gradually changed into paraplegia, and he had several minor attacks, characterized by pain of the head, back, and limbs, with feverishness. For two months before death the palsy rapidly increased ;—when it reached the trunk he had retention of urine and sloughing of the nates ; and during the last 36 hours of his life he gradually lost the power of speech and swallowing, and his mental faculties. There was no disease in the brain except a little serous effusion between the membranes. The cord itself was sound, but its membranes exhibited traces of inflammatory action, and there was between them considerable effusion of a reddish serous fluid. At the upper dorsal vertebræ, on the left side, there was an apoplectic cyst, more than an inch in length, and about half an inch in diameter,—it was external to the cord, and contained the red and broken remains of a coagulum. The coagulum seemed to be contained in an adventitious membrane, under the pia mater of the cord.

SECTION V.

THICKENING AND FUNGOID DISEASE OF THE MEMBRANES OF THE CORD, AND FUNGUS OF THE CORD ITSELF.

1. The Count de Lordat, aged 35, received an injury of the neck by being overturned in his coach from a high and steep bank. He felt at the time only some pain in his neck, which went off in a few days. Six months after, he had weakness of the left arm, and some difficulty of articulation, and these symptoms continued

stationary for nearly twelve months. They then increased, the arm becoming withered and useless, and his speech nearly lost, and he had involuntary convulsive motions of the whole body. After another long interval, his right arm became benumbed; he was also seized with dyspnœa and difficulty of swallowing, and his body was much emaciated. His bowels were loose; his urinary functions were natural. His death happened suddenly, nearly four years after the accident. His intellectual faculties had remained entire; his lower extremities had been for a considerable time weak and unsteady, but not entirely paralytic, for he could walk from one room to another, leaning on a man's arm, a few hours before his death. The spinal cord included in the cervical vertebræ was found remarkably firm, and the membranes of this portion were so dense, that there was great difficulty in cutting through them. The medulla oblongata appeared one-third larger than natural. The pia mater was thickened, and, towards the falx, there was some appearance of suppuration; the ventricles were full of water. The lingual and brachial nerves, at their origin, were very compact or nearly tendinous. This hardness was found, in the cervical nerves, to be owing to the density of the membrane covering them.*

2. A young man, aged 14, fell from a window in the second story of a house into the street. His back was much bruised, but without fracture; and he afterwards continued to walk with his body bent considerably forwards. After three years and a half, he was seized with violent pain in the back, thighs and legs; and a tumor began to form over the lumbar vertebræ, which increased gradually till it attained to a very great size. The prominent part of it was red, and repeated attacks of hæmorrhage took place from the apex of the tumor. He was then affected with complete paraplegia, incontinence of urine and feces, and extreme emaciation; and at length died gradually exhausted, about six years after

* London Medical Observations and Inquiries, vol. iii.

the accident. On dissection, the tumor was found to consist of a large fungous mass resembling the medullary substance of the brain, which took its origin from the spinal cord, and had extended itself upwards and downwards, from the third dorsal vertebra to the coccyx. Many of the vertebræ, both dorsal and lumbar, were extensively carious on the posterior part, and some of the lumbar vertebræ had nearly disappeared. There was a general softening of all the bones of the spine and of the sacrum and ilium.*

3. A man, aged 20, in the beginning of 1815, had first impaired digestion, then difficult breathing and palpitation; and, in the end of April, he had anasarca of the legs, and such strong and extended pulsation of the heart, as left no doubt of the existence of dilatation and hypertrophia of the left cavities of the heart. He was relieved by diuretics, and continued better till May, when he had pain, tenderness, and distention of the abdomen. After free evacuation of the bowels, these symptoms subsided, and, about the 18th May, it was first observed that he had weakness of the lower extremities, without diminution of sensibility. All the other symptoms now disappeared. On the 20th of May, the paraplegia was complete, with retention of urine; and he now, for the first time, complained of pain in the loins. There was still no diminution of sensibility, but, on the contrary, the limbs, when moved, were extremely painful. His digestion was now good, his breathing easy, the action of the heart natural, and his mind entire; and he continued in this state till the 22d of July, when the paralytic limbs became insensible. Grangrene then took place on the sacrum, and he died on the 10th of August.

Inspection.—The bodies of the third, fourth, and fifth cervical vertebræ were unequal and slightly softened, and the anterior ligament was destroyed. The outer membrane of the cord at this place had degenerated into a thick fungous tubercular mass, of the firmness of

* New London Med. Journal for 1792.

the pulmonary tubercles not suppurated, and of a greenish-yellow colour. This mass extended one decimetre and five millimetres in length, and four millimetres in breadth, and involved in it the ganglions of the seventh cervical and three first dorsal nerves. The portion of the cord covered by this mass was in a state of ramollissement, which affected chiefly the anterior columns; but the posterior columns were also slightly softened, in a space corresponding to the three upper dorsal vertebræ. The brain was sound, except a small tubercle in the right hemisphere; the heart was quite sound, and the lungs, except one small tubercle, not softened. In the abdomen there were adhesions and some puriform fluid.*

Fungoid disease of the dura mater of the cord is also met with in connexion with disease of the vertebræ; several cases of this kind are related by Ollivier. Dr. Bright has described a case of paraplegia of five years standing, in which a portion of the cord had degenerated into a soft translucent jelly of a reddish purple colour. From the portion which was thus chiefly degenerated, in the middle of the dorsal region, the substance of the cord formed a canal, tapering upwards and downwards, filled with a watery jelly. There was also some scrofulous tubercular matter at the portion principally diseased.

SECTION VI.

INDURATION OF THE SPINAL CORD.

This part of the pathology of the cord is exemplified in the remarkable case of the Marquis de Causan. His complaint began with a prickling in the fingers and toes of the right side which extended gradually upwards

* Serres, Anat. Comp. de Cerveau, tom. ii. p. 234.

along the arm and leg; the parts wasted, became cold, and lost their feeling; but they retained such a degree of motion, that he could walk with the assistance of a crutch under the arm of the affected side. He had continued in this state more than a year, when the left side became affected in the same manner. He was then confined to bed, and incapable of any motion, either of the trunk or extremities, the other functions continuing for some time in a healthy state. His sight and hearing were next affected, being first weakened, and gradually destroyed. In the same gradual manner he lost his speech and the power of swallowing; and soon after this he died. The pulse and breathing had continued natural until a short time before death, when both became remarkably slow; the pulse being from 30 to 40 in a minute. On dissection, the brain and all the viscera, were found in the most healthy state. That part of the spinal cord which is included in the cervical vertebræ was so hard as to have the consistence of cartilage; and the membranes of this portion were red as if inflamed.*

SECTION VII.

NEW FORMATIONS COMPRESSING THE SPINAL CORD.

These occur under the same variety of forms which have been already referred to in regard to the brain. The most common appear to be fleshy and albuminous formations, tubercles, hydatids, and ossifications.

1. A woman, aged 36, had first some convulsive motions, which soon ceased; then acute pain of the left arm with headach; the arm became weak, and gradually completely paralytic. She then had convulsive motions of the lower extremities, which also became

* Portal, Cours d'Anatomie Medicale, tom. iv.

completely paralytic. The right arm next became painful, and the motion of it was impaired, but not entirely lost. The inferior extremities became œdematous; the inferior half of the thorax, and all the parts below, were completely deprived of sense and motion: and the right arm at last also became entirely paralytic. Extensive gangrene then took place on the sacrum, and she died gradually exhausted somewhat more than three months from the commencement of the paralysis.

Inspection.—On the anterior part of the cord, between the body of the cord and the arachnoid, there was a tumor of a reddish-yellow colour; it was about three lines in thickness at the thickest part, and covered the anterior surface of the cord, from the sixth cervical nerves to the third dorsal: and the part of the cord which was covered by it was considerably flattened. Internally, the tumor was of a firm fleshy consistence, and of a yellowish-white colour. On many parts of the arachnoid of the cord, cartilaginous scales were observed.*

2. A young man, aged 14, received a blow upon the spine, between the shoulders, by falling backwards against the corner of a chair. The only effects which immediately followed the injury were, that he was observed to hold his chin down towards the breast, and that he complained, on raising his head, of a pain striking through and across his chest. After four weeks, he was affected with weakness of his legs, which increased till, in a short time, they became entirely paralytic. About the same time, he lost the power of retaining his urine and feces. He had continued in this state for two or three weeks, when his arms became paralytic, and he then lost the power of moving his head. He died on the following day, about three months after receiving the injury, having continued sensible to the last. During the progress of the disease, he frequently complained of great oppression and pain darting through the chest. On dissection, the viscera of the thorax and

* Velpeau, Arch. General, de Med. January, 1825.

abdomen were found to be healthy. Some bloody serum escaped in opening the head, but the brain in other respects was sound. Much bloody serum was discharged from the spinal canal, and, on opening it, a soft substance was found, four inches in length, lying between the bones and the spinal cord at the place of the injury. When this substance was taken out, and shaken in water, a great part of it was dissolved. Parts of the same substance had protruded through between the transverse processes of the fourth and fifth dorsal vertebræ, and formed two tumors of similar soft matter, lying one on each side of the spine, in the hollow between the spinous and transverse processes. The largest of these was between three and four inches long, one and a half broad, and about an inch in thickness. The spinal cord and the vertebræ were sound.*

3. *Tubercles* are found of various sizes, either in the substance of the cord or attached to its membranes, and they present the same characters as the tubercles of the brain. The symptoms vary exceedingly, according to the seat and size of the tubercles, or as they happen to affect particular nerves. A child, aged 12, mentioned by Ollivier, had been long subject to convulsive attacks, which occurred at irregular intervals, and affected chiefly the arms: he died of phthisis. A tubercle, the size of a nut, was found betwixt the dura mater and the arachnoid of the cord at the third cervical vertebra. In a case by Bayle, there was tonic inflection of the forearm, hand, and fingers; and in one by M. Gendrin, there were epileptic paroxysms, which always commenced with a violent attack of hiccup, of one or two minutes duration. There were two large tubercles in the substance of the cord at its very origin. In a case of paraplegia, mentioned in Magendie's journal, two small tumors were found attached to the cord at its lower extremity. Harderus found a tumor the size of a nutmeg, compressing the spinal cord of a young woman; and there were three similar tumors in

* London Medical Obs. and Inq. vol. iii.

the cerebellum. From his description, they were evidently tubercles, and the case was complicated with disease of the lungs and the liver. The leading symptoms were, severe headach, oppressed breathing, and, a few days before death, violent convulsions.

To the various examples now given, of tumors and tubercles of the cord, I shall only add a case by M. Gendrin, which presents some interesting characters. A woman, aged 23, after recovering from epidemic cholera, felt great weakness, especially of the lower extremities, with anorexia, thirst, and occasional diarrhœa. After two months, the motion of both legs was found greatly impaired, especially of the left, in which there was also diminished sensation, and a pain which extended from the origin of the sciatic nerve quite to the extremity of the toes; and both limbs were affected with a sense of coldness and prickling. Soon after this she began to have pain in the lumbar region, and this was succeeded by acute pain in both limbs, with convulsive retraction of the toes. This pain was most acute in the left limb, and there was now increased sensibility of the left foot, so that the slightest touch produced a sense of laceration; and this morbid sensibility afterwards extended to the knee. She had then fever, with pectoral symptoms, and died gradually exhausted in October 1832, which appears to have been between six and seven months from the commencement of the disease. The right limb was continually numb, but some degree of motion remained in both. On inspection, there was found, at the lower extremity of the spinal cord, a firm white tumor, the size of a filbert, enclosed in a cyst, and slightly softened in the centre. It lay between the two columns of the cord of the left side, and, in some degree, encroached upon those of the right; the left anterior column, in particular, was much distended and flattened by it.

4. *Hydatids* in the spinal canal have been mentioned by various writers. A woman mentioned by Esquirol, became epileptic after a fright, and the fits returned every second or third day with great violence for three

years. She then became comatose after one of the paroxysms, and died in five days. The pituitary gland contained a cyst full of a reddish brown fluid, and hydatids of various sizes were found within the sheath of the spinal cord through its whole extent. In a case of paraplegia of nine months standing, M. Chaussier found a mass of hydatids attached to the spine behind the left kidney, and a branch from the mass entered betwixt the vertebræ into the spinal canal. A similar case is related by M. Reydellet in the Dict. des Sc. Med., in which the tumor was opened, and the spinal cord was felt by the finger exposed at the bottom of it, after a large quantity of hydatids had been discharged. The patient remained paraplegic, and afterwards died, gradually exhausted by the discharge from this cavity.

5. *Ossification of the membranes* of the cord has been observed in several cases. In a woman who had been epileptic for five years, and died suddenly in one of the fits, Esquirol found the sheath of the spinal cord, on its external surface, covered through its whole extent with osseous scales, from one to two lines in diameter. In a case described by M. Barbier,* the affection began with prickling and numbness of the legs, which extended very gradually, and was afterwards accompanied by acute pain in the limbs, and after several months terminated in complete paraplegia, with incontinence of urine. The patient, a woman of 55, continued in this state about three years. She was then seized with acute pain in the back, extending into the stomach and abdomen, and down the legs, and accompanied by vomiting, fever, delirium, and convulsive motions of the limbs. She died after a short illness, the duration of which is not distinctly stated, but seems to have been eight or ten days. At the third dorsal vertebra, there was an ossification of the membranes of the cord half a line in thickness, three lines broad, and two inches long. The inner surface of this production was concave and covered with a soft membrane; and the por-

* Traité Element. de Mat. de Med.

tion of the cord included in it was almost destroyed, the membrane containing only a small quantity of viscid fluid. Above this, the cord was firm and healthy; below, it was much wasted.

6. The cord may also be compressed by a diminution of the spinal canal, but this appears to be a very rare occurrence. It was, however, observed by Portal. The canal of the last dorsal and two upper lumbar vertebræ was diminished one half, and its inner surface was rendered unequal by numerous small bony eminences. The inferior extremities were much wasted.

SECTION VIII.

DESTRUCTION OF A PORTION OF THE SPINAL CORD.

A MAN, whose case is related by Mr. Copeland, had paraplegia, dysuria, obstinacy of the bowels, and a feeling of tightness across his belly, as if a broad band had been bound tightly round it. His health had been declining for more than a year, and the commencement of his complaints was ascribed to having violently sprained his back in lifting a heavy weight. After being confined to bed with perfect paraplegia for three months, he died of gangrene of the nates. On dissection no disease could be discovered in the vertebræ. Within the last dorsal and first lumbar vertebræ, the spinal cord was entirely wanting for more than two inches. The membranes, which there formed an empty bag, were unusually vascular and much thickened.* On the other hand, Ollivier found four inches of the cord entirely wanting in a child, aged 8 years, who died of extreme marasmus, with caries of the vertebræ, but without loss either of sensibility or motion of the limbs.

* Copeland on Diseases of the Spine.

Velpeau has described several cases, in which, in connexion with caries of the vertebræ, the cord was completely destroyed for the space of several inches, the patient having died of gradual marasmus without any appearance of paralysis; and in Majendie's journal, a case is described, in which the cord had become quite liquid, through two-thirds of the dorsal region and one-third of the cervical. The arms were paralytic without loss of sensibility, but the legs were not affected. Ollivier has also observed in two cases a remarkable wasting or diminution of the size of the cord. The one was in an old man, without any particular symptoms; the other in an idiot, with permanent contraction and wasting of the limbs.

SECTION IX.

CONCUSSION OF THE SPINAL CORD.

A SEVERE blow upon the spine frequently occasions an immediate loss of power of the parts below the seat of the injury, without producing either fracture or dislocation of the vertebræ. The extent of the parts affected will of course depend upon the seat of the injury. Paraplegia and retention of urine are the symptoms which most commonly come under our observation; but, if the injury be on the upper part of the spine, there may also be paralysis of the upper extremities, difficulty of breathing, and affections of the voice. In tracing the farther history of this affection, the following circumstances are worthy of attention.

1. Concussion of the cord may be speedily fatal without producing any morbid appearance that can be detected on dissection. Many cases of this kind are on record. Boyer mentions a man who received an injury of the spine by falling into a ditch. He was imme-

diately affected with complete paraplegia, and died in consequence of the injury; the period of his death is not mentioned. On dissection no disease could be discovered either in the head or the spinal canal. Frank mentions four fatal cases of concussion of the spine, in none of which could any morbid appearance be detected, either in the vertebræ or in the spinal cord.

2. It may be fatal by inflammatory action taking place in the cord or its membranes, and terminating by ramollissement, suppuration, or effusion. Case CXLVI. affords an example of this affection fatal by ramollissement. A remarkable case, fatal by extensive suppuration, has been already quoted from Sir Charles Bell. Boyer mentions a man who fell from a height of fourteen feet, and remained for some time senseless. On recovering from that condition he was found to have lost the use of his lower extremities. He had also retention of urine and involuntary discharge of feces, and died in twelve days. On dissection, a quantity of bloody serum was found in the spinal canal, the quantity of which was sufficient to fill a little more than the lower half of it.

3. Urgent symptoms may follow the injury, and after some time may be removed. Galen mentions a man who, after an injury of the back, was affected with loss of speech, loss of voice, and paralysis of the lower extremities, the superior extremities remaining unaffected. After seven days he recovered his voice and speech, and soon after the palsy also disappeared.

In Summer 1816, I saw a man who had been employed in blowing a rock near Edinburgh. Not having retired to a sufficient distance, and standing with his back to the rock when the explosion took place, a large piece of stone struck him on the spine about the lower dorsal and upper lumbar vertebræ. He instantly fell, completely deprived of power in the lower extremities. I found him in this state a few hours after the accident, when he also complained of violent pain, beginning in the seat of the injury, and extending downwards along the thighs. On the back there was an ex-

tensive swelling, which made it impossible to ascertain the state of the vertebræ. He was confined to bed for several weeks without any power of his lower extremities, and with considerable difficulty in passing his urine, but gradually recovered, and in a few weeks more was free from complaint. The practice which was employed, consisted chiefly of general and topical bloodletting.

In Hufeland's Journal, vol. xxi. is related the case of a man who fell from the top of a cart-load of wood, and lighted so that the weight of his body, on first coming to the ground, rested upon the back of his neck and shoulders, his head being bent forwards. When he recovered from the first effects of the shock, it was found that he had lost completely both feeling and motion of all the parts below the neck; he could move no part but his head, and he had retention of urine and obstruction of the bowels. After eight or ten days, he was affected with anasarca of the limbs, and a sense of prickling followed by severe pain, but without any power of motion. After lying several weeks in this state of perfect paralysis, he began to recover a slight degree of feeling and motion, beginning in the fingers; and from this time, the power of motion increased very gradually, so that at the end of sixteen weeks he was able to support himself in a sitting posture on a chair. After another long interval, he was able to drag himself about, supported upon crutches: and, at the time when the case was written, he was able to walk a little supported by a stick, and to do a little work with his hands, but he continued to have great weakness and pain of his back, the pain being chiefly referred to the junction of the spine with the sacrum. The progress of the functions of the bladder and the bowels, in this case, is somewhat remarkable. He had first complete retention of urine, requiring the use of the catheter for four weeks; he then recovered the power of passing his urine, but could not retain it; it flowed involuntarily, and after some time longer, he recovered the power of retention. The bowels were not moved without strong

glysters for six weeks; after this the stools passed involuntarily for four weeks, and he then recovered the natural action.

A man, mentioned in the Journal Universel. tom. xxviii., fell from a tree and lighted on his back, and likewise struck the back of his head, in which a wound in the integuments took place. He was for some minutes thrown into a state of syncope, on his recovery from which it was found that the lower extremities were entirely deprived of sense and motion. He had afterwards retention of urine, tumefaction of the abdomen, headach, dilatation of the pupil, extreme anxiety, difficult deglutition, and stertorous breathing, and the pulse was as slow as 38 in a minute. He recovered gradually, and was well in three weeks.

Some cases of injuries of the spine have been accompanied by loss of motion without loss of feeling, and others by loss of feeling without loss of motion. In a singular case described by Ollivier, there was incontinence of urine, with loss of feeling of the penis and scrotum, and of the anterior, posterior, and interior part of the thighs, without any loss of motion. In such cases the sensibility of the parts sometimes returns gradually, and in others the affection is permanent.

4. It may produce permanent paralysis. This may occur immediately, or the first effects of the injury may be recovered from, and a new diseased action may take place after a considerable time. Several examples of this have already occurred under the foregoing heads. The slight nature of the first symptoms, in such cases, and the slowness of their progress, will be illustrated by the following case.

Case CLI.—A man, aged 54, about twenty-five years ago, fell from the branch of a tree, and lighted on the sacrum. He was carried home, complaining of pain in the lower part of the spine, and entirely paralytic in his lower extremities. In this state he was confined to bed about twelve days, and then recovered, so as to be able to follow his usual employment; but from this time he

was affected with a peculiar feeling of numbness, which was confined to the upper part of the left foot. This feeling gave him no inconvenience, but never left him. After he had continued in this state for four years, the numbness suddenly extended upwards along the leg and thigh, and was speedily followed by paralysis of these parts. After some time he was seized with pain, which stretched across the lower part of the back, and into the right thigh, and was soon followed by paralysis of the right thigh and leg. He was then confined to bed with perfect paraplegia for about two years. Some time after this he recovered so much power as to drag himself about supported upon two crutches. He was in this state without any farther improvement, when I saw him for the first time, upwards of fifteen years ago. His spine was free from distortion, but he complained of deep-seated pain upon pressure about the last dorsal vertebra, and at the top of the sacrum. Two caustic issues were inserted, and under the action of them he made some improvement; he was able to raise his legs a little higher in walking, and occasionally to stand without his crutches, but from that time he continued stationary, and was much distressed with incontinence of urine.

The morbid action which takes place in such a case as this, will be illustrated by the facts which have been already recorded. It is probably of the nature of chronic inflammation of the cord or its membranes, terminating by some of the morbid conditions which have already been referred to. We have seen that such affections may supervene upon very slight injuries of the spine, which do not at the time of receiving them induce any urgent symptoms, and perhaps attract little or no attention. Sometimes they take place after so long an interval that the patient has forgotten the injury, or, if he remembers it, does not consider it as having any connexion with his disease. A man mentioned by Sir Charles Bell, became paralytic in the lower extremities, several months after a slight injury of the spine, occasioned by striking his back against the corner of a table.

A gentleman walking in the fields near Edinburgh sprained his back slightly in leaping over a wall. He felt little uneasiness at the time, but, after several weeks, his lower extremities became paralytic. In this state he continued four or five months, and then gradually recovered under the usual treatment. In other cases the symptoms take place at an early period, and with such activity as distinctly marks inflammatory action. A young man mentioned by Dr. Jebb received a blow on the spine from a stone. In the evening of the same day he was seized with shivering, followed by fever, which ran high through the night, but abated in the morning. He had at the same time pain in the stomach and back, with contraction of the legs, and this was followed by weakness of the legs, which, after ten days, increased to perfect paraplegia. Issues were then inserted, and he was able to walk in three months.

Every injury of the spine should be considered as deserving minute attention, and the most active means should be employed for preventing or removing the diseased actions which may result from it. The more immediate object of anxiety in such cases is inflammatory action, which may be of an active or of a chronic kind; and we have seen that it may advance in a very insidious manner, even after injuries which were of so slight a kind that they attracted at the time little or no attention. When the injury is of a more violent nature, there is indeed another object of attention, that is, fracture or dislocation of the vertebræ. But we have seen that the most urgent symptoms may take place immediately after the injury, and may even be speedily fatal without any affection of the vertebræ; while, on the other hand, it is often impossible to ascertain the state of the vertebræ, in consequence of the external swelling which takes place. It is likewise to be kept in mind, that fracture of the vertebræ may happen without any displacement of parts, and in such a situation, that it is impossible to discover it. A case is mentioned by Camper, in which paraplegia took place after an injury of the spine, and which gradually recovered after twelve

months. On the death of the patient, which happened some time after from fever, he found that one of the lumbar vertebræ had been fractured in the body without displacement, and had united.

Under this head, I may allude very briefly to the subject of wounds in the spinal cord, in regard to which there are some very singular facts upon record. A young man, mentioned by Ollivier, was struck with a poniard through the upper part of the neck, and fell instantly, deprived of feeling and motion of all the parts below the head. He had also retention of urine, but recovered gradually, and was able to walk a little in about five months. In a similar case by Boyer, the man recovered, but with palsy of the right arm, and loss of feeling of the left side in all the parts below the thorax. The case is well known of a man, mentioned by Desault, who lived twenty-four hours, and moved all his limbs freely after the cord had been completely divided by a musket bullet at the tenth dorsal vertebra. A still more remarkable case is related in the Memoirs of the Academy of Sciences. A man received a wound with a sword among the lower dorsal vertebræ, which soon healed, and he was afterwards able for long marches. After a considerable time, the place became painful, suppurated, and was opened; and a piece of the point of the sword, two inches long, was extracted. He died in thirty-six hours; and it was found that the sword had penetrated between the spinous and oblique processes on the left side, that it had completely traversed the spinal canal, and had lodged in the opposite side. A man mentioned in the first volume of the Archives Generales de Medecine, received a wound by a musket bullet, which entered at the groin, and came out near the first lumbar vertebra. The wound soon healed, but after a short time loss of feeling began around the cicatrix, and gradually extended until it affected the whole left side of the body except the face. Any part of the thorax, the abdomen, or the leg or arm of that side, could be pinched with any degree of force without feel-

ing. The power of motion was preserved, though it seemed weaker than in the other side. His health was otherwise unimpaired. After the affection had continued in this state for years, it was removed under the use of a succession of large blisters.

SECTION X.

OF CERTAIN AFFECTIONS OF THE BONES OF THE SPINE.

It would be foreign to my purpose to enter minutely upon this important subject; but there are some circumstances relating to it, which it may be proper to mention very briefly, in connexion with the object of this essay.

In the ordinary cases of carious and distorted vertebræ, accompanied by paraplegia, it is well known that the paralysis is not produced simply by the distortion; for the distortion may exist in a very great degree without paralysis; and when they have existed together, the paralysis may be entirely removed, while the distortion remains undiminished. It appears that it is the inflammatory action of the parts which deranges the function of the cord; that the effects of this in reference to the cord may subside, though the disease of the bones may go on to anchylosis and permanent distortion; or that, on the contrary, it may terminate by fungoid disease of the membranes, or chronic disease of the cord itself, and thus the palsy become irremediable. The original disease appears to be in some cases seated in the ligaments and membranes; in others, in the articulating surfaces and intervertebral cartilages; and in others, in the bodies of the vertebræ. It is when the bodies of the vertebræ are extensively affected, that the caries which follows produces distortion; but even in this case, distortion is not an invariable consequence, for the caries may

take place in such a manner as to diminish the size of the vertebræ equally along its whole surface, and thus merely to shorten the spine, without distorting it. This is said to occur most frequently in the lumbar vertebræ. The case of a boy related by Dr. Armstrong, is very important. He had involuntary discharge of urine and feces, difficult breathing, and paralysis of all the extremities except a very imperfect degree of motion in the left arm. There was much pain and tenderness on pressure in the cervical vertebræ, but no distortion. He recovered completely in a few months, the vertebræ that had been affected remaining in a state of anchylosis. In this case, the disease was probably confined to the articulating surfaces. Mr. Copeland gives a plate, in which three of the dorsal vertebræ are represented as united by anchylosis, the intervertebral cartilages being removed, but without any loss of substance in the bodies of the vertebræ. In this case, paralysis had taken place, but there was no perceptible distortion. In attending to such cases in practice, therefore, it is not sufficient to ascertain the existence or non-existence of distortion. The whole spine should be examined with care, with the view of detecting the existence of inflammatory action. This will be indicated by pain or tenderness on pressure, or pain on passing a hot sponge over the part in the manner recommended by Mr. Copeland. The disease in its early stages is sometimes of very small extent; in a case which occurred to me some time ago, it was limited to a spot on one side of the spine, which could almost be covered by the point of the finger; but it was of so peculiar a nature, that very moderate pressure upon the spot produced syncope. The patient was an officer in the navy, and got well under the usual treatment.

A minute examination of the spine, therefore, should always be made with the utmost care, when any of those symptoms occur which have been observed to be connected with affections of the spine or spinal cord, especially if they do not yield readily to common modes of treatment, or if they have occurred after injuries of

the spine. The principal symptoms of this kind are the following:—Weakness, numbness, or convulsive affections of any of the limbs; spasmodic starting of the limbs, occurring chiefly during the night; loss of the full power of the muscles, so that though the patient can walk with sufficient steadiness, he cannot perform such motions as are required in running or leaping; numbness along the margin of the ribs, and a peculiar oppression and tightness accross the region of the stomach; various affections of the breathing; difficulty in discharging the urine and feces, or difficulty in retaining them. Complaints such as these have sometimes been found to be connected with affections of the spine or spinal cord, after they had been mistaken for dyspeptic or asthmatic disorders, or for diseases of the urethra or rectum. A case has been formerly described, in which an affection of the spinal cord, at one period of its progress, was accompanied by all the symptoms of hypertrophia of the left side of the heart; but these disappeared long before death, and the heart was found on inspection perfectly healthy.

It is indeed true, that diseases of a most formidable nature may exist in the cord itself or its membranes, though nothing can be detected by the most careful examination of the spine; but these are quite distinct from the particular class of affections which are here referred to, and in regard to which we cannot be too attentive in watching the very earliest indications. One symptom, in particular, which should always be contemplated with much suspicion, is a feeling of tightness or constriction along the margin of the ribs, as if a tight band were passed across the stomach. This is generally accompanied with a feeling of distention in the lower part of the abdomen, as if the bowels had in part lost the power of propelling their contents. These feelings may be considered as merely flatulent or dyspeptic, and in many cases, they may in fact be nothing more; but they will likewise be found by an attentive observer, to be frequently among the first indications of a dangerous affection of the spine, and to exist before there is any

affection of the limbs, or any disease can be discovered in the spine itself. In one of the last cases that occurred to me, symptoms of this kind had existed for nearly three months before a projection was discovered in one of the lower dorsal vertebræ, and this was soon followed by perfect paraplegia.

It is worthy of attention, that symptoms affecting internal organs may exist in connexion with diseases of the spine, without being attended by any affection of the limbs, or any symptom calculated to direct our attention to the spine as the seat of the disease. A girl mentioned by Mr. Copeland, had difficulty and pain in emptying the bladder, pain and tightness round the margin of the thorax, and difficult breathing; her limbs were not affected, except that she was more easily fatigued than her companions. One of the dorsal vertebræ was found to project a little, and by topical bleeding and blistering on this part, and rest in the horizontal posture, all her complaints were removed. A man mentioned by Dr. Jebb, had pain under the short ribs on both sides, cough, and irregular pulse. From the parts affected lancinating pains extended downwards along the thighs, occasioning much uneasiness in walking, resembling the pains of rheumatism. The ninth or tenth dorsal vertebra was found to protrude, and by issues applied at that place, all his complaints were removed.

The remedies on which we chiefly rely in all cases of this kind are topical bleeding, blistering, issues, and rest in the horizontal posture; but some cases are on record, showing in certain conditions of the disease the beneficial effects of mercury. A girl mentioned by Sir Charles Bell, after an injury of the spine, was confined to bed for eight months in the most helpless state, her back bent, and her knees drawn up. She recovered entirely under a course of mercury, given her on account of syphilis, with which it was discovered that she had been affected from the time of the accident. In the transactions of a Society for the Improvement of Medical and Surgical Knowledge, is related the case of a man, who

had squinting, difficulty of swallowing, indistinct articulation, paralysis of the left leg and arm, and protrusion of several of the cervical vertebræ. Under a course of mercury all his complaints disappeared, and the protrusion of the vertebræ was diminished, though not entirely removed. Several cases have recovered by confinement to the horizontal posture without any other remedy; this occurred in Dr. Armstrong's case, lately referred to.

The spine may be affected with extensive caries without the existence of any symptom that marks such a state of disease. A man mentioned by Sir Charles Bell, who had been liable to severe pain in his back, and fits of palpitation, died suddenly after a long walk. The only morbid appearance observed on inspection was a large scrofulous abscess in the posterior mediastinum, with caries of several of the vertebræ, of such extent that the spinal cord was exposed in several places. I saw a similar abscess in the posterior mediastinum, with caries of the bodies of five or six of the vertebræ, in a girl who died of phthisis. She had complained for some time of severe pain in the back, but her complaints in other respects did not differ from the usual symptoms of phthisis. A similar appearance in the lumbar vertebræ, with a psoas abscess containing two pounds of matter, has been described by Mr. Benjamin Bell.* The vertebræ were so diseased, that large pieces of them were separated, and the matter was in several places in contact with the spinal cord. The patient, a man of 40, had complained of severe pain in his back and thighs, which prevented him from raising his body into the erect posture, but there was no distortion of the spine, and no paralysis. He had considerable difficulty of breathing, but this was accounted for by a diseased state of the lungs. Other remarkable cases are on record, showing extensive disease of the spine without any fatal result. Duverney found the atlas so brought forward upon the foramen

* Edin. Med. Com. vol. iii.

magnum, that there was not a space of more than two lines in diameter left for the cord; and Bertin has described a preparation in which the atlas was so anchylosed with the occipital bone, that its posterior arch crossed the centre of the foramen magnum. The history of this case is not given, but it is evident from the anchylosis, that it was not speedily fatal. Similar contractions have occurred, though not to the same extent, in the ordinary cases of caries of the spine, terminating by distortion and anchylosis, but without paralysis.

In connexion with this subject, it may be right to allude very briefly to some of the phenomena connected with the affections of the processus dentatus.

1. It may be affected with caries without producing any urgent symptoms, until it suddenly give way and prove fatal. A man, mentioned by Mr. Copeland, had been using mercury for a disease in the tibia, and had for some time complained of stiffness and pain when he moved his head. On making a sudden turn of his head he was seized with convulsions, and died in a few hours. On inspection, the processus dentatus was found completely detached from the vertebra, having been eroded by caries. A woman mentioned by Ollivier, had pain in the neck and difficult deglutition; the muscles of the neck were rigid, and the least motion of the head was insupportable, so that she was constantly confined to the horizontal posture, and almost to one particular position; she then had cough and difficult breathing, and at last died after several months. There was extensive disease of the lungs, and the processus dentatus was entirely destroyed by caries. The posture in which this woman had been long confined, probably prevented her more sudden death.

2. It may be dislocated by violence, of which many examples are on record. A man mentioned by Sir Charles Bell, was making a violent effort to propel a wheelbarrow from the street upon the raised foot pavement, when the wheelbarrow suddenly went from be-

fore him, and he fell with his chin upon the curb-stone. He was dead in a few seconds; the processus dentatus was found to have crushed the spinal cord, the ligaments having given way.

3. It appears that the ligaments of the processus dentatus may yield in a more gradual manner, giving rise to a course of urgent symptoms for some time before the affection is fatal. Some years ago, a man was received into the Infirmary of Edinburgh, who had been accustomed to carry burdens on his left shoulder, his head consequently being bent to the right side. He complained of pain in the forehead and occiput, extending down the neck, pain in the throat, great difficulty, or rather impossibility of swallowing, articles taken into the œsophagus being rejected with some violence after they had passed a short way. He had rigid contractions of the neck and back, resembling tetanus; his articulation was slow and difficult, and the pulse 54. These complaints had begun about six weeks before, and had been increasing gradually; difficulty of swallowing was one of the first symptoms. Two days after his admission, his left side became paralytic; on the following day, the right was affected in the same manner, and his breathing became laborious. He died in three days more, having lost all power of moving the parts below the neck. On inspection, it was found that the ligaments had given way on the left side of the processus dentatus, so as to allow it to compress the spinal cord. No other disease could be discovered in any of the viscera.

For the following important case I am indebted to Dr. Hunter. It illustrates in a striking manner many of the observations made in this section, and shows, in connexion with the disease of the vertebræ, complete paralysis, without any remarkable affection of the body of the cord.

Case CLII.—A young lady, aged 15, in the beginning of the year 1825, began to complain of a dull pain

in the neck, which to a certain extent limited its motions. She became languid, depressed, and sallow; and the symptoms went on in this manner, without exciting much attention, till about the middle of March. Dr. Hunter was then consulted about her, on account of an increase of the uneasiness in her neck, which was accompanied by considerable swelling in the back part of it. Several tumors had also appeared on the scalp, in which fluctuation was felt, and on opening them, the bone beneath was found to be carious. The swelling of the neck gradually increased to a great extent on each side of the spine, and became irregularly softened; and when opened, discharged ill-conditioned strumous matter, in small quantities. The pain in the neck increased to such an agonizing degree as totally to prevent motion; it extended at times to the left side of the head and face, and fixed, for a certain time every day, with excruciating severity, over the left eye. At an early period of her illness, numbness of the superior extremities took place, which increased to perfect paralysis; there was also rigid contraction of the flexor muscles of the legs, with a slight degree of twisting of the mouth. The pulse became frequent; the breathing was natural when she was awake, but during sleep was accompanied by a loud snorting noise. The appetite was tolerable, and the other functions were natural. The caries of the bones of the skull gradually penetrated both tables, without any affection of the sensorium occurring. One or two new openings took place in the swelling on the neck, from which a discharge continued. She became gradually more and more emaciated, and died exhausted on the 1st of January, 1827.

Inspection.—An incision being made on the back of the neck, and carried down to the spine, gave vent to a considerable quantity of matter which lay in contact with the vertebræ; and the surrounding soft parts were in a state of pulpy degeneration. The four upper vertebræ were found to be more or less affected with caries, which was most remarkable in the first

and second. The articulating surfaces of the atlas were deeply eroded, and there was a similar erosion of the articulating surfaces of the occipital bone. In the second vertebra, the processus dentatus was entirely separated from the body of the bone, the caries having completely penetrated it at its attachment, and there was besides considerable loss of substance on the posterior part of the vertebra. The membranes of the cord were thickened, and the cord itself was a little softened at the upper part, but in no remarkable degree.

A remarkable case, analogous to this, is mentioned by M. Meyrieu.* The patient had pain and stiffness of the neck, his head being bent to one side, and immoveable; difficulty of swallowing; and after some months, palsy of all the limbs. He died suddenly when his head was accidentally moved in doing some necessary office about his bed. The external parts of the neck presented a mass of soft disease. There was caries of the right condyle of the occipital bone, of the right side of the atlas, and of the processus dentatus; and there was destruction of the ligaments, so that the atlas was luxated from the occipital bone.

I conclude this part of the subject with the following case, which shows disease of the processus dentatus, complicated with a new formation, presenting the characters of fungus hæmatodes.

Case CLIII.—A gentleman, aged 22, of a scrofulous habit, in the early part of his life had suffered amputation on account of a disease of the knee, and afterwards was liable to pectoral complaints with hæmoptysis. In the beginning of the year 1828, he began to complain of pain and stiffness of the neck, referred chiefly to the left side of it, and much increased by the motion of the head. The pain sometimes extended into the larynx, and backwards towards the scapula. After

* Bull. de la Soc. de Med.

considerable relief from repeated blistering, &c., the symptoms returned, accompanied by loss of appetite, frequent pulse, and night perspirations; and soon after this he became affected with difficult deglutition, some dyspnœa and hoarseness. There was now also severe fixed pain referred to the back of the head, and much increased by the motion of the parts: so that he was obliged to support his head with both his hands when he had occasion to make any change of his posture. He was next affected with paralysis of the tongue and the upper eyelid of the left side. On 16th January 1829, he was seized with paralysis of the left arm, and two days after, the right was affected in the same manner. He had then great pain and difficulty in passing urine, with obstinacy of the bowels, which nothing could overcome. On the 29th, the lower extremities became paralytic, and he died on the 31st, having suffered greatly on the day on which he died, from difficult breathing.

Inspection.—All the external parts of the neck, the pharynx, &c. were healthy, and no disease was discovered in any of the vertebræ in their external aspect. The brain and cerebellum were healthy, except some increase of vascularity. Within the foramen magnum, and attached to the inner surface of the dura mater at its anterior and lateral parts, there was a spongy tumor of a greyish yellow colour, which, when cut into, presented a variegated structure, resembling fungus hæmatodes. The processus dentatus was rough and carious on its surface, and it was so much elongated as to project half an inch into the cavity of the cranium. Its ligaments also were partially destroyed, so as evidently to allow it to encroach upon the area of the spinal canal, and to compress the cord. The spinal cord at the upper part was flattened, but not materially altered in its texture.

In regard to the treatment of the diseases of the spinal cord, it is not necessary to enter into any long

detail, as it must be regulated by the same principles as the corresponding affections of the brain. In the more acute affections, we must, of course rely chiefly on free general and topical bleeding, assisted by blistering, purgatives, and the other usual auxiliaries. When the affection is in a more chronic form, the treatment will consist chiefly in local applications, as topical bleeding, blistering, and issues, aided by the horizontal posture. In the early stages of such affections, I think the most satisfactory treatment, after free topical bleeding, is by a succession of blisters, applied first on one side of the spine, and then on the other, in quick succession, and repeated in this manner to a considerable number. In some of the cases great benefit is also obtained from continued moderate purging.

SECTION XI.

CONCLUDING OBSERVATIONS ON THE PATHOLOGY OF THE SPINAL CORD.

THE preceding observations on the diseases of the spinal cord, I merely propose as an imperfect plan or outline of this most important subject, in the hope that it may engage the attention of those who have opportunities for prosecuting the inquiry. When we review the phenomena which have been observed to accompany the diseases of the spinal cord, we find affections of all the principal organs of the body. In the parts connected with the head and neck, we find distortions of the eyes, convulsive affections of the face, difficulty and loss of speech, loss of voice, contraction of the jaw, resembling trismus, and difficulty of swallowing, which is said, in some cases, to have nearly resembled hydrophobia. In the viscera of the thorax, there have been observed op-

pression, palpitation, and strong and irregular action of the heart; painful sense of stricture in the region of the diaphragm, and difficulty of breathing, which, in some cases, has been permanent, and in others, has occurred in paroxysms, resembling asthma. In the organs of the abdomen and pelvis, we find vomiting, pain of the bowels, resembling colic; tenesmus, involuntary discharge of fæces, and retention or incontinence of urine. In the muscular parts we observe convulsions and paralysis; the convulsions in some cases resembling chorea, in others tetanus. We are by no means prepared to say, in the present state of our knowledge, that all these proceed directly from the affections of the spinal cord, especially as we observe remarkable diversities and considerable want of uniformity in the symptoms. But the subject presents to us a field of observation which promises most important and most interesting results. It has also opened up a wide field of conjecture, in regard to the influence of the spinal cord, in several diseases which have hitherto been involved in much obscurity. These conjectures are not to be altogether overlooked, but are of value only in as far as they direct us to subjects worthy of being investigated by farther observation. They have chiefly referred to the following points.

Spasmodic Diseases.—Several writers of eminence have conceived that many spasmodic and nervous diseases have their origin in affections of the spinal cord. Hoffman, in his Essay De Morbis Discernendis, directs us to distinguish betwixt epilepsy and convulsions. In the former, he says, the membranes of the brain are affected, in the latter the membranes of the spinal cord. In his Treatise De Morbis Convulsivis, he divides convulsive affections into idiopathic and symptomatic. The former, he thinks, arise from irritation of the membranes of the spinal cord; the latter he supposes to depend upon diseases of other organs, and that the effect of them, by the influence of these diseases upon the spinal cord, is extended over the whole body. Ludwig dis-

cusses the same doctrine more particularly, ascribing many hypochondriacal and hysterical affections to irritation at the origin of the intercostal nerves, and explaining the affections of the lungs, the larynx, &c. in such diseases, by the connexion of these nerves with the par vagum. Lieutaud contends that all convulsive affections, in which the speech is not impaired, depend on diseases of the spinal cord, and he considers tetanus as an example. The same doctrine is supported by Burserius, Fernelius, and Belfingerus (De Tetano.) Portal supposes that slight pressure on the spinal cord produces convulsion, and greater, paralysis; and he thus accounts for the one passing into the other by gradual increase of the pressure.

In the present state of our knowledge it must be confessed that these doctrines, however ingenious, are to be considered as little better than conjecture. Many facts, however, have been already related, and others are on record, which show, in connexion with diseases of the spinal cord, symptoms closely resembling those of chorea and tetanus. Hoffman mentions a boy, who, after a blow on the sacrum, was seized with a violent convulsive affection nearly resembling tetanus, with loss of memory, difficult articulation, and delirium. The complaint continued with great severity for five days, and afterwards returned at nearly regular periods for six months. Burserius relates the case of a man who died of tetanus, induced by exposure to cold after intoxication; on dissection a large quantity of viscid yellow serum was found under the outer covering of the spinal cord. Frank also relates a case of "horrible tetanus," which was induced by a blow upon the spine, but he gives no account of the appearance on dissection. Several cases have been detailed in which, in various diseases of the spinal cord, symptoms occurred, closely resembling tetanus; and this important subject has been further investigated by Dr. Reid, in his work on Tetanus. Upon the whole, however, the truth appears to be, that though symptoms strictly tetanic do accompany

various affections of the spinal cord, the disease properly to be considered as idiopathic tetanus is entirely of a different nature, and that the pathology of it is still involved in great obscurity.

2. *Colica Pictonum.* I have referred to the case of a woman mentioned by Bonetus, in whom paralysis followed severe colic, and extensive serous effusion was found under the membranes of the spinal cord. Privatius, as quoted by Sauvages, mentions a woman who, after suffering from violent gastrodynia for three hours, was attacked with palsy of all the parts below the neck, and died in two months. At an early period of the disease, protrusion had taken place of the last cervical vertebra, but no account is given of the dissection. In this case, the pain was supposed to be symptomatic of the disease in the spinal cord; and similar to this is the view which several continental writers have taken of Colica Pictonum. They consider it as a real inflammation of the spinal cord, (Rachialgia Saturnina,) and on this principle they have proposed to treat it by blood-letting.* This opinion, however, has not been confirmed by farther, and more accurate observation. M. Gendrin examined carefully four cases of long standing, and could not detect any appearance of disease, either in the brain, spinal cord, or their membranes.

3. *Fever.* Ballonius ascribes many of the symptoms of fever to an affection of the spinal cord, particularly the pain in the back, tremors of the limbs, and oppression of the breathing.† A remarkable case has been quoted from Brera, in which the cord became affected in a case of malignant fever; and Rachetti relates the case of a girl who died of petechial fever which had induced coma. On dissection, there were found evident marks of inflammation in the spinal cord and its mem-

* Astruc. Quæstio Medica, An morbo Colicæ Pictonum rectius Rachialgiæ, venæsectio?

† Ballonii Consilia Medica.

branes, and a quantity of puriform matter about the cauda equina; there were also marks of inflammation in the brain and its membranes.*

4. *Epilepsy.* M. Esquirol, some years ago, presented to the Faculty of Medicine at Paris, a memoir on epilepsy, in which he states that he had examined the bodies of fifteen patients who died of this disease, and found the spinal cord affected in all of them. The dissections, however, presented no uniformity of appearance. In one there were hydatids; in another the membranes were as if injected; in a third the arachnoid of the cord was of a greyish colour. In several of the cases the medullary substance of the cord was softer than natural at particular parts, and in one it was harder. In one case the spinal cord at the 11th and 12th dorsal vertebræ was soft and of a light brown colour. In a young woman, in whom the paroxysms returned with menstruation, he effected a cure by repeated applications of moxa to the spine.

5. *Hydrophobia.* M. Salin seems to have been the first who conjectured that in this horrible disease the spinal cord is affected; and a case is related in Dr. Johnson's Medico-Chirurgical Journal for October 1817, which seems to afford some probability to the conjecture. The case was well marked, violent, and speedily fatal. The membranes of the brain were found highly vascular, with considerable serous effusion; but the principal marks of disease were in the coverings of the pons Varolii, medulla oblongata, and the upper part of the spinal cord. These parts are said to have formed one crust of intense inflammation, and, on the spinal cord, this crust was more intense than in any of the other parts. M. Gendrin, however, states, that he has assisted at the examination of many cases of hydrophobia, and never could discover any disease either in the spinal cord or the nervous ganglia.

6. *Many cases of Dyspnœa* are supposed by Frank

* Rachetti della Struttura, delle funzoni e delle Malattie della Midolla-Spinali.

to proceed from disease at the origin of the phrenic nerves; and difficulty of speaking and of swallowing frequently depends, according to Portal, on "engorgement" in the cervical portion of the spinal cord.

I leave these conjectures for the investigation of the reader, and shall hasten to bring this Essay to a close, by a brief allusion to some points which seem to be related to the subject, while they show the difficulties and obscurities which attend it.

Several very remarkable cases have occurred to me which presented all the characters of extensive disease of the spinal cord, while nothing could be found, either in the brain or the cord, that could in any degree account for the symptoms. Several of the same kind, in which the symptoms were equally decided, are mentioned by Dr. Bright.

Case CLIV.—A woman, aged 35, was first affected with numbness in the thumb of the left hand, which gradually extended over the whole hand and arm. The limb was then partially paralytic, and was likewise affected with involuntary motions exactly resembling those of chorea. This continued several weeks, and then gradually ceased; and the arm recovered its healthy state. Almost immediately after this, the right hand and arm were affected in the same manner, and after some time also got well. The legs then became affected with starting, involuntary twitches, and a feeling in walking, as if they would start from under her to one side. The complaint went on in this manner for some time, and then terminated in complete paraplegia, with retention of urine, requiring the constant use of the catheter. She was now confined to bed for nine months, and died of extensive gangrane of the sacrum and tops of the thighs. For some time before her death, she had recovered the action of the bladder.

Inspection.—No disease could be discovered in the brain or the spinal cord, except that the cauda equina was of a very dark colour, as if it had been soaked in

venous blood, and there was some bloody fluid around it. The sacrum was remarkably soft, and in some places carious ; and it was covered externally by a deep and extensive sloughing sore. All the other viscera were healthy.

Case CLV.—A medical gentleman, aged 30, who had been for several years in the navy, returned home in perfect health, and was living in Edinburgh, when he was observed by his friends to drag his legs awkwardly in walking. He was not himself at first sensible of it, but soon perceived a weakness and want of command over both his legs, which gradually increased to nearly perfect paraplegia. Some time after the affection of the legs took place, he began to lose the power of his arms, and this also increased, till he retained in them only a very feeble and unsteady power of motion. They were also frequently seized with convulsive startings, so that any article which he attempted to hold was thrown from him with violence. The legs often started in the same manner, and were thrown about with considerable violence, especially when he attempted to move them while he was sitting up. No disease could be discovered in the bones of the spine, and he was otherwise in good health, until about two years after the commencement of the complaint, when he was seized with phthisis, of which he died in September 1822. I examined the body with the utmost care, and could not discover a vestige of disease either in the brain or the spinal cord.

Case CLVI.—A woman, aged about 20, a servant, sprained her back in lifting some heavy article of furniture. She felt at the time no great inconvenience, but some time after, weakness of the legs took place, which gradually increased to perfect paraplegia. After some time the affection extended to the arms, and she then had not a vestige of motion of any of the parts below the head, except a very slight motion of some of the fingers; but the internal functions were all entire, and

her speech was distinct, except that, in speaking, she was sometimes seized with spasmodic twitches of the lips and lower jaw. She lived in this state without any change in the symptoms, her general health continuing good, for about twenty years. In the morning she was taken out of bed, and placed in a chair so contrived as to support her in a sitting posture. Her arms were supported on a cross board which passed before her; and if, by any accident, one of them slipped from this support, she had no resource but to call the assistance of another person to replace it. Having been on one occasion left alone for about two hours, after one of her arms had thus slipped down, the hand had become extensively œdematous. In the same manner, if her head fell forward upon the thorax, it remained in that position until raised by an attendant. Her mind was entire. She died of four days illness, with symptoms of low typhus fever. I examined the body with the utmost care, along with Dr. Pitcairn, who had been in the habit of seeing her for several years, and we could not discover any disease, either in the brain or the spinal cord.

Case CLVII.—A lady, aged 30, had been liable for several years to a feeling of stiffness of her neck, with an uneasy feeling in the back part of it, which made her sometimes sit with her head bent very much forward, and at other times thrown backwards; about two months before her death, these feelings increased, and were accompanied by pain, extending along both the arms; at first like rheumatic pains with stiffness, but soon amounting to paralysis. She had now only a very imperfect motion below the elbow, and could not raise either arm to her head; there was very slight motion of the fingers, and they were sometimes spasmodically contracted. The speech became thick and partially inarticulate; she had considerable difficulty in swallowing, and she observed that there were certain positions of the neck, in which she could swallow with greater facility than in others. Her pulse was good, the other

functions were natural, and the motion of the lower extremities was not at all affected. About a fortnight before her death, she became affected with dyspnœa, which occurred in paroxysms, sometimes very severe. An appearance of projection was now observed, with pain upon pressure, in several of the lower cervical vertebræ. Issues were inserted in this place, and for a week she seemed better; she was free from dyspnœa, and the motion of the arms was considerably improved. On the evening of the 4th October, she became suddenly comatose with some convulsion, and had a peculiar convulsive motion of the lower jaw, which was for some time in a state of constant and rapid motion, opening and shutting with violence. The arms also became more paralytic. She seemed relieved after a bleeding, but, after two hours, sunk again into a comatose state, and died suddenly.

Inspection.—In the upper part of the pharynx and larynx, there was a superficial redness like very recent inflammation; but, on the most careful examination, no disease could be discovered in the brain, the spinal cord, or the bones of the spine; and all the other viscera were in a healthy state.

I shall add no comment on the simple relation of these remarkable affections, but merely illustrate them by an important case described by Bretanneau.* A lady, whose age is not mentioned, was affected with palsy in the little finger of the left hand, which gradually extended over the hand, and then over the arm. The left lower extremity then became affected in the same gradual manner, and after this, the arm and leg of the right side, with the exception of the thumb and two fingers of the right hand, which preserved the power of motion. The motion of the tongue was then lost, and at last deglutition was much impeded. She preserved her intellect to the last, and expressed herself by moveable letters, which she arranged with the thumb

* Revue Medicale, May 1826.

and two fingers of the right hand, of which she preserved the power. The duration of the disease is not mentioned. There was a small quantity of fluid in the ventricles of the brain; but the brain itself, the cerebellum, and spinal cord, being examined with the utmost care, were found perfectly healthy, with the exception of a small spot upon the tuber annulare. On the right side of this, at the depth of four lines, there was a portion three lines in extent, of the colour of rust. Its centre was of the deepest colour, and its circumference irregular, gradually losing itself in the surrounding substance; and it seemed rather harder than the other parts.

The morbid appearance, in this singular case, has a remarkable resemblance to the morbid condition of a small part of the brain, formerly referred to, and exemplified in Case CXXXV. It is probably the result of a slow inflammatory action, limited to a very small portion of the cord, in the same manner as we have seen it in the brain. There is reason to expect, that a very minute examination of the whole cord, in such cases, may discover similar changes of structure, calculated to throw light upon affections which are at present involved in much obscurity. The following is one of the most remarkable that I find on record.

A woman, mentioned by Ollivier, a servant, was suddenly seized while making a bed, with a very strong sense of pricking in the points of the fingers of the left hand, and the points of the toes of the left foot; and half an hour after, the same parts on the right side were affected in the same manner. She continued to go about for three hours, after which she was obliged to sit down from a feeling of fatigue; and after sitting for some hours, she was carried to bed. Next day, there was paralysis of all the limbs, but in the greatest degree on the left side. The sensibility of the parts was not impaired. Respiration was performed with a kind of effort, and at night became very difficult. On the third day, respiration was rather improved, but there was difficult deglutition. In the evening the difficulty

of breathing increased, with frequent pulse and strong action of the heart, and she died at night. There was a slight appearance of infiltration of blood in the cellular tissue on the outside of the dura mater of the cord, especially about the lower part. No other vestige of disease could be discovered either in the brain or the spinal cord; and all the other viscera were in the most healthy state.

I conclude this subject with a brief allusion to certain obscure and anomalous affections, which, like those now mentioned, present many of the characters of disease of the spinal cord, though their termination in general is more favourable. The affections assume a great variety of characters, and the nature of them is exceedingly obscure. The most common symptoms are various spasmodic affections of the limbs, or of the muscles of the back, sometimes resembling chorea, or even tetanus; and various degrees of weakness of the lower extremities, sometimes amounting to complete paralysis, which is often accompanied by remarkable spasmodic affections of the paralytic limbs. There is generally a great feeling of weakness in the back, and frequently pain, which is sometimes confined to one part, but more commonly extends in a greater or less degree along the whole of the spine. Various affections of the breathing likewise occur, sometimes with attacks of palpitation, and various uneasy feelings in the stomach and bowels. The affections occur almost entirely in females, chiefly those of the higher ranks, and are generally extremely tedious and untractable. It is indeed difficult to say what treatment has any decided control over them; but the remedies which appear to be most beneficial are, free and regular purging, or a combination of tonics and anti-spasmodics, with small doses of purgatives; strong friction; cold spunging or shower bath, and blistering on the spine. The affections commonly pass off, without leaving any bad consequences, —sometimes very suddenly, and without any cause to which their removal can be ascribed.

One modification of these singular affections will be illustrated by the two following cases, which lately occurred to me in the same family. A strong and healthy girl, aged 8, of a full habit and florid complexion, was observed to stumble frequently in walking, and occasionally to fall; and this, without any farther warning, was followed in a very few days, by perfect palsy of both lower extremities. I saw her about a fortnight after the attack, and found the limbs completely paralytic, with frequent spasmodic contractions. Nothing was to be discovered about the spine, and she was in other respects in excellent health; the bowels were rather confined, but easily regulated. About a month after the commencement of this affection, her elder sister, aged 16, who had been rather delicate, and at times hysterical, was observed to walk awkwardly; and, in a few days, she lost entirely the use of the lower extremities. She was now for some time in a great measure confined to bed, and the affected limbs were liable to strong spasmodic contraction; her knees being drawn up to the abdomen, and the heels to the buttocks. In this manner she lay during the whole time while she was awake; but as soon as she fell asleep, the limbs were stretched out into an easy natural posture. She slept well in the night, but the moment she awoke, the limbs were drawn up into their contracted condition. If an attempt was made to extend them, great and continued force was required, until they were brought nearly to the extended position, and then the complete extension took place with a sudden jerk. They now remained in this extended position for a few seconds, when they were by another sudden and painful jerk thrown back into their contracted state. This young lady had also occasional spasmodic affections of the arms, and of the muscles of the neck; but these were transient, and there was no diminution of muscular power in the arms. There was considerable uneasiness of the back, but nothing could be discovered by examination of the spine. Both cases continued in the state which I have described for nearly six months,

and then got entirely well. The treatment consisted chiefly of free and continued purging with tonics, and antispasmodics, topical bleeding and repeated blistering on the spine. In the elder of the two, one of the blisters led to the formation of a large and troublesome carbuncle on the spine, and this seemed to accelerate the cure.

I do not know whether the following case ought to be referred to this class; it excited my attention as a very remarkable affection at the time when it occurred, and I have not seen another exactly resembling it. A gentleman, aged 34, of a slender make and very active habits, was affected in the summer of 1815 with numbness and diminished sensibility of all the extremities. In the inferior extremities, it extended to the tops of the thighs, and sometimes affected the lower parts of the abdomen; in the superior extremities, it never extended above the wrists. There was along with it a diminution of muscular power. He could walk a considerable distance, though he did so with a feeling of insecurity and unsteadiness; but he could not in the smallest degree perform such motions as are required in running, leaping, or even very quick walking. He was in other respects in good health. Various remedies were employed, without benefit; evacuations and spare diet seemed rather to be hurtful. He had continued in the state which I have described, for about two months, when he determined to try the effect of violent exercise. For this purpose, he walked as hard as he was able, five or six miles in a warm evening, and returned home much fatigued, and considerably heated. Next morning, he had severe pains in the calves of his legs, but his other complaints were much diminished, and in a few days disappeared. He has ever since enjoyed very good health.

These anomalous affections occur under other modifications, considerably different from those which I have now described. I received from my friend, the late Dr. Monteith of Glasgow, a very interesting account

of two cases which occurred to him under a very aggravated form. One of these, a lady, aged 22, was at first affected with violent headach, accompanied by a sense of tension in the head, and strong throbbing in the carotids, temporal arteries, and throughout the head; the pulse 120. Large and repeated bloodletting was employed for the first ten or twelve days, until she was "pale as paper," and exceedingly enfeebled, but without any relief. After four weeks, she became affected with violent pain in the lower extremities, which were drawn up and could not be extended, the thighs being drawn up to the abdomen, and the legs bent back upon the thighs; and every exacerbation of the headach was followed by an increase of irritation, pain and retraction of the limbs. The headach was chiefly referred to a spot upon the left parietal bone, where she had received an injury by a fall three months before. A variety of practice was employed with very little benefit; and her only relief was from bloodletting, and large doses of laudanum, of which she sometimes took 500 drops in the course of a night. Mercury appeared at one time to be productive of some benefit; the effect, however, was only temporary, though she went through repeated courses of it. She used Prussic acid to a great extent, the warm bath, and a variety of other remedies with very little benefit. At the end of about three years, the limbs for the first time became so free from pain and irritation as to bear applications with the view of remedying the stiffness of the joints; and, at the end of about three years more, she was gradually restored to perfect health. This lady was not for an hour free from headach for three years, but besides this constant pain, she was liable to violent exacerbations of it, lasting from a few days to several weeks. During these attacks the pulse became very strong and jarring, and the face flushed and swelled; and the only relief she obtained was from repeated bloodletting, so that in the course of her illness she was bled from the arm ninety-eight times, besides frequent topical bleeding by leeches and cupping.

The other patient was a young lady of 17, whose complaints also began with violent headach, for which she underwent a great variety of treatment for upwards of twelve months, without any permanent benefit. On the contrary, about the end of this period, the pain rather increased, and she was confined to bed in a state of extreme exhaustion, and suffering from constant and intense headach. Soon after, she first complained of pain in the spine, and this was speedily followed by a sudden attack of most excruciating pain in both lower extremities, extending over every part of them, and accompanied by such increased sensibility that she could not bear the weight of the bed-clothes upon them, and the slightest touch with the finger made her scream. There was also tenderness and morbid irritability of the trunk and upper extremities, so that she could not allow the arm to remain fully extended during the short time of feeling her pulse. From the commencement of this affection of the limbs, they began to be powerfully retracted, and after a short time they were drawn up close to the body; and there was severe pain extending along the whole course of the spine, where, however, no disease could be discovered on examination or by pressure. She now became much emaciated, pale, and debilitated; the headach was rather relieved, but the limbs continued in the same state, and the slightest touch upon them, or the most gentle attempt to extend them, gave such violent pain, that, for eight months, Dr. Monteith said, she was not moved in bed six inches. At the end of four years, this lady began to improve, and to get out of bed a little daily; but at this time her legs were so much bent upon the thighs, and the knees so rigid, that no force could bring them to a right angle. At the end of three years more, Dr. Monteith's report of her was, that she could walk a short way, and was progressively improving, so that he entertained sanguine hopes of a complete recovery. I visited this lady along with Dr. Monteith in the course of her illness, and I certainly never saw a case which gave me more the impression of deep-seated and hopeless disease.

The history of these cases conveys a more distinct impression of this extraordinary affection than could be given by any description. Other varieties of the symptoms were observed in some of the other cases which occurred to Dr. Monteith, particularly long-continued and uncontrollable vomiting, fits resembling epilepsy and catalepsy, palpitations and various irregular actions of the heart, and a strong and painful pulsation extending along the whole course of the spinal cord. There were also irregular attacks of fever, fits of colic, and severe spasms in the abdomen, which were relieved only by large opiates. There was in general a remarkable aversion to light, and one of his patients lay in a state of almost total darkness for more than a year. In another patient, a lady of 30, the arms were affected, but not so severely as the lower extremities. This lady was confined to bed for two years, and then recovered perfect health, which she had enjoyed for five years at the time when I received this account. In another there was such incessant vomiting that she retained nothing in the form of food, drink, or medicine, for six weeks. In this case the vision was also very much impaired, and twice suspended for a very considerable time. Nothing was to be discovered about the spine in any of these cases, and the pain in the spine was not increased by pressure, but it was very much increased by motion, or by attempting a sitting posture. In the treatment, temporary benefit was experienced from bloodletting, very large opiates, and warm bath; but, upon the whole, the disease seemed gradually to wear itself out, without any mode of treatment having a sensible effect in arresting its progress. Even after considerable improvement has taken place, the disease is apt to relapse from very slight causes. In one of Dr. Monteith's cases, a cure was so far accomplished in eighteen months, that a drive for a short way in a carriage was then recommended; but this produced a relapse, which lasted another year, and was fully as violent as the first.

This affection has been described by Dr. Burns of

Glasgow; and he mentions some other symptoms as occasionally attending it in his observation, such as attacks of dyspnœa, resembling croup, temporary loss of speech, and of the power of swallowing, and temporary aberration of mind. He agrees with Dr. Monteith, in regard to the tedious and untractable character of the disease, and confesses, that "in most cases, he has not seen decided advantage from any medicine, beyond what was required for symptoms as they arise, time appearing the chief remedy." I find an analogous affection described by Dr. Guerin of Mamers, in a tract "Des Irritations Encephaliques et Rachidiennes." One of his patients, a young man of 16, had first attacks of palpitation and difficult breathing, then violent pains in the upper part of the abdomen, and, after six months, attacks of loss of recollection, with convulsive motions of the arms, grinding of the teeth, and violent palpitations of the heart. These attacks continued to recur at uncertain periods; and, during the intervals, he did not entirely recover from the effects of them. He continued depressed and incapable of any mental exertion, unable to bear the least light or noise, and the attacks were excited by any exertion or mental emotion. The patient continued in this state for upwards of four years, and then gradually and completely recovered. The principal remedies employed were purgatives, topical bleeding, prussic acid, and vegetable diet. In another case, very similar, in a young man of 20, he found benefit from the use of cold effusion.

I have frequently seen in young females a slighter affection, in which there was pain referred to various parts of the spine, sometimes chiefly to the lower part of it, and sometimes extending upwards and downwards along the whole course of the spine. There was generally some degree of weakness of the limbs, with great disinclination to walking, sometimes with spasmodic twitching of the toes, especially in the night-time. I have treated such cases by topical bleeding and blistering, without benefit; and I have generally found the

Attempts have been made, to explain these singular cases, by the doctrine of spinal irritation. But it may, perhaps, be doubted, whether this conveys any definite notion, or whether it is not to be considered as a gratuitous principle, assumed so as to answer to the phenomena, rather than deduced from observation. When we find, along with the complaints now mentioned, symptoms distinctly referable to the spine, as pain or tenderness on a particular spot, it is fair to consider this as directing our attention to an important seat of disease; but there is no doubt that these affections often appear, without any symptom that can be referred to the spine, and in many cases with sources of irritation, distinctly referable to other organs. A gentleman, about whom I was consulted some time ago, had a severe and long-continued attack of nephralgia, which was at last relieved by the passage of a calculus; but such a degree of inflammatory action had been excited, that, for several weeks after the violence of the attack had subsided, he discharged purulent matter in his urine, in large quantity. In the course of the complaint, and about the time when the violent pain, which was in the region of the left kidney, was beginning to subside, he was affected with difficulty of swallowing, a sense of constriction in the œsophagus and the pit of the stomach, and spasmodic affections of both upper and lower extremities, and of the left side of the face, closely resembling tetanus. These continued in a greater or less degree for eight or ten days.

But it is chiefly in females that these anomalous spasmodic affections are met with; and in these, one of the most remarkable features of them, is the connexion which they have, even in their most aggravated forms, with the state of menstruation. The following case will illustrate this in a striking manner, and at the same time exemplify some of the various forms which are assumed by these singular affections.

Case CLVIII.—A lady, now aged 28, in the year 1823 was first affected with numbness and partial loss of power of the right arm and leg, and some time after had slight difficulty of articulation. These symptoms subsided under the usual treatment, and returned after some months, when they affected the legs and arms of both sides, and had more of the characters of chorea. After another interval of several months, she became liable to attacks of blindness, which were occasioned by a falling down of the upper eye-lids, so that she could not raise them; and when they were raised by the hand, the eyes were found to be distorted upwards. These attacks generally continued for several weeks at a time, and were relieved by cupping on the temples.

With these symptoms the two first years of her illness passed. In the third year, she was affected with convulsive action of the muscles of the back, and involuntary twitches of the legs and arms, producing convulsive motions of the whole body, which it is impossible to describe. These were much increased by touching her, especially on any part of her back; also by laying her upon her back, or even by approaching her as if with the intention of touching her. At one time there was difficulty of deglutition, so that attempts to swallow produced spasms resembling tetanus. At other times, after lying for a considerable time quiet, she would in an instant throw her whole body into a kind of convulsive spring, by which she was thrown entirely out of bed; and in the same manner, while sitting or lying on the floor, she would throw herself into bed, or leap on the top of a wardrobe fully five feet high. During the whole of these symptoms, her mind continued entire, and the only account she could give of her extravagance was, a secret impulse which she could not resist.

After a considerable time these paroxysms ceased, and she was then affected with convulsive motions of the muscles of the upper part of the back and the neck, producing a constant rotatory motion of the head. This sometimes continued without interruption night and day for several weeks together, and if the head or neck were

touched, the motion was increased to a most extraordinary degree of rapidity. During the attacks, she could not sleep, except in the sitting posture, the motion continuing during this imperfect sleep, though in a more moderate degree; but if she happened to slip down, so that her head touched the pillow, she instantly awoke with a severe convulsive start, and the motion was increased to the greatest degree of rapidity. These paroxysms were relieved by nothing but cupping on the temples to the extent of 10 or 12 ounces, when the affection ceased in an instant, with a general convulsive start of the whole body. She was then immediately well, got up, and was able to walk about in good health for several weeks,—when the same symptoms returned, and required a repetition of the same treatment. Sometimes, from the violence of the motion of the head, it was impossible to cup her on the temple. In this case, the cupping was applied first on the back; and by this, the motion was so far moderated, as to allow it to be applied on the temple, without which the paroxysm was never removed. Bleeding from the arm to the extent of faintness only moderated it for a time, but did not remove it. Another very singular feature of the affection was, that it subsided fully only when it went off in an instant, with a sudden convulsive start of the whole body: when it subsided gradually, as under the influence of large bleeding, it returned as soon as the faintness from the bleeding was removed.

The affection went on in this manner, with intervals of tolerable health of a few weeks duration, for about four years, besides the two years formerly mentioned. The longest interval was one of about three months, but even during these intervals various convulsive motions were excited by slight causes. Menstruation was all along extremely irregular and very scanty, and the bowels were torpid. She was of a pale and bloodless aspect from the frequent bleedings, but not reduced in flesh. I saw her only at an advanced period of the disease, along with Mr. Gillespie, who had watched her through its whole progress, and by whom every

variety of treatment had been employed with the utmost assiduity.

At last, in the spring of 1829, we found her under a severe paroxysm of the rotatory motion of the head; when it was determined to allow the attack to take its course, and to direct our attention entirely to the menstruation. With this view she began to take three grains of sulphate of iron three times a day, with two grains of Barbadoes aloes,—the aloes being afterwards diminished according to the state of the bowels. She went on with this for nearly three weeks; the convulsive motion of the head continuing without intermission night and day. At length, in the middle of the night the paroxysm ceased in an instant, with the same kind of convulsive start of the whole body with which it used to cease after cupping. At the same instant menstruation took place in a more full and healthy manner than it had done for many years. She has continued from that time free from any return of the affection.

I conclude this subject with the following case, which shows another form of this affection. If we were required to give a name to this modification, we could probably call it nothing but a very aggravated form of hysteria.

Case CLIX.—A young lady, aged 15, in October 1828, was thrown from a horse, but did not appear to sustain any injury except a contusion of the arm, and she did not complain of any thing else for a week after the accident. At the end of the week she fell asleep in her chair one evening, and awoke in a state of incoherence, talking in a wild extravagant manner, and appearing totally unconscious of the presence of those who were about her, and entirely occupied with her own hallucinations. This condition continued in a greater or less degree for three weeks, notwithstanding much active treatment by bleeding, purgatives, &c. The bowels were throughout remarkably torpid. She then

began to recover, and went on in a state of progressive improvement for about three weeks, when one evening she fainted, and on recovery was found to be in the same state of incoherence as before. This paroxysm continued a fortnight, and was succeeded by another fortnight of convalescence, when the affection was reproduced by the patient being told of the illness of a near relative.

During the paroxysms she generally complained of intense headach, which was chiefly referred to the occiput; the pulse varied from 90 to 120; the tongue was white; the bowels torpid and motions unhealthy; her nights were sleepless. After the third of the paroxysms now mentioned her convalescence was less perfect than formerly, there being generally a good deal of excitement in the evening, and very restless nights. In the end of January 1829, after much previous irritation, she fell into a state of coma, with flushing. This continued several days, and was succeeded by a state resembling catalepsy; the eyes being continually fixed in one direction, but without perception; total unconsciousness of any thing that was done about her; and the jaws so firmly locked that she swallowed nothing for several days. The jaws then gradually relaxed, and she recovered the power of swallowing; after several days more she began to speak, after having spoken none for 13 days, and then went on gradually improving for some weeks. The comatose state then returned, and was succeeded as before by the cataleptic, the jaws being again rigidly contracted, and the under lip drawn between the teeth so as to be wounded; the face and neck were flushed and turgid. This attack subsided after bleeding, &c., and was succeeded by cataleptic paroxysms of a slighter kind, which were excited by various causes, such as the sight of a stranger or any degree of mental irritation. In these attacks she became suddenly silent and motionless, the eyes open but fixed and insensible, with total unconsciousness of every thing; the hands clenched and the arms drawn towards the body. She continued in this state from a few

minutes to half an hour, and generally came out of it with a scream and without any recollection of the attack, or of the circumstance which had excited it. In the middle of March she became again incoherent and unmanageable, and this alternated with the cataleptic attacks till the middle of April, when a new set of symptoms commenced. While lying in the cataleptic state, she would suddenly, and by a convulsive motion, raise her body into a sitting posture, the head projected forward, the tongue protruded, and the countenance much distorted; the hands clenched and firmly pressed on each side of the trachea. During these attacks respiration seemed nearly suspended for some minutes, and in her convulsive efforts to breathe, she sometimes raised herself into a standing posture, and required the care of several attendants to prevent her from throwing herself out of bed. These paroxysms returned frequently and at short intervals, and were relieved only by bleeding from the temporal artery. After some time they ceased, and were succeeded by the slighter cataleptic attacks excited by various slight causes. It was at this period of the complaint that I first saw her along with two eminent medical men who had the charge of her: from that time there was no return of the violent paroxysms, and there was a gradual improvement in her general health, which could not be ascribed to any other cause than a change of scene, and sending her regularly out into the open air. The attempt to do this at first excited the cataleptic state, and she continued totally insensible the whole time she was in the carriage. But we persevered, and this gradually subsided, so that she was soon able to take a long drive without exciting it, but there was generally some recurrence of it before she returned home. The slighter paroxysms were still excited by the sight of a stranger, or by any cause of mental agitation. During these her body became motionless, but without losing her balance, though she was sitting on a chair without leaning to the back of it, and even in some instances while she was standing. The eyes were open, fixed, and insensible; the arms ge-

nerally rigid, but sometimes relaxed, and the attack continued from a few minutes to half an hour. She was also seized occasionally, while walking, and continued to walk on steadily, leaning on the arm of another person, and even walking alone, and often came out of the fit without stopping. She was also repeatedly seized while playing on the piano, and continued to play with perfect correctness, but repeating a certain part of a tune, and never going on beyond a particular point. This she sometimes continued to do for ten minutes at a time, during which period she was totally unconscious of any external impression. On one occasion she was playing from the book a piece of music which was new to her, and had played a part of it when she was seized with the cataleptic attack. During the paroxysm she continued to play this part, and repeated it five or six times in the most correct manner; but when she recovered from the attack, she could not play it without the book. The catamenia, in this case, were rather irregular, and at times scanty, but occurred in a very natural manner several times during her illness, which, at the time to which this account refers, had continued ten months. Soon after that time she was removed to a distant part of the country, and I have heard of her only occasionally. But I understand she has never been entirely free from the affection, though the symptoms are now in a slighter degree.

I make no apology to practical men for these long details, as the affections are of a very uncommon kind, and as it is impossible to convey any idea of them by a general description. There are other modifications presenting very singular characters, but I must allude to them very briefly. A young lady whom I saw with Mr. William Wood, along with some symptoms resembling chorea, was liable to paroxysms, in which she screamed out the sound, *echum, echum, echum*, with great rapidity, and in a tone of voice that was heard over every part of a large house. These paroxysms often continued for one, two, and even three hours at a time, and occurred repeatedly during the day, and

sometimes in the night. They were excited by any sudden noise, or the sight of a stranger; and in the night-time not unfrequently by the striking of a clock. Her mind was quite entire, but she had no control over the affection, except that during the paroxysm she could change the sound when she was requested to do so, and substitute any other word that was suggested to her. The affection went on for many months, and then gradually subsided. We could scarcely say that medical treatment was of any avail. It consisted chiefly of a long continued course of purgatives. For a considerable time after her recovery, though she was not at all affected by her disorder being talked of, she showed the greatest dread of the sound *echum* being repeated in her hearing.

Another lady, whom I saw with Dr. Poole, was liable to paroxysms of rapid and laborious breathing with a loud shrill sound, and the appearance of the utmost distress, as in the most aggravated form of croup. They came on without any warning, when she was in perfect health and if not relieved, continued for days together. They were relieved by nothing but blood-letting, but in several instances, a bleeding of three or four ounces was sufficient; and on one occasion, the attack was removed by a puncture of the arm, when no blood was obtained, or only a few drops. The affection subsided gradually after continuing to recur in this manner for more than a year.

A case of much interest has been related by Dr. Follot of Namur. A strong country woman being much terrified during the flow of the menses, the discharge was suddenly suppressed. After four months, she experienced creeping sensations, spasms, and involuntary motions of the lower extremities; and in the following month, the limbs became forcibly bent, so that the heels touched the buttocks, and every attempt to extend them produced the most acute suffering. These symptoms continued five days, and then subsided; but they were renewed at the same period in the succeeding month, and subsided after the same duration, but left a

degree of paraplegia. The attacks were afterwards moderated by repeated topical bleeding, vapour bath, &c., but the affection continued in a greater or less degree for six or seven months. Menstruation having then taken place in a full and healthy manner, her complaints entirely disappeared.*

* Medical Gazette, vol. i.

APPENDIX

TO

PART FOURTH.

OUTLINE OF THE DISEASES OF NERVES.

NEARLY allied to the pathology of the spinal cord, is another subject of very great interest, the pathology of nerves. This subject is entirely in its infancy, but the investigation seems to promise very interesting results. From what we already know, there is every reason to believe, that nerves are liable to diseases analogous to the diseases of the brain and of the spinal cord, which may affect them either in their substance or in their membranes, and are probably the source of several diseases which are at present involved in much obscurity.

In as far as this subject has hitherto been investigated, the following may be considered as the principal idiopathic diseases of nerves which have been observed.

I. A unform dark red colour of the nervous substance, occupying a defined space, perhaps an inch or two in extent. This was observed by Martinet,* in the median nerve, in a case in which there had been violent pain of the fore-arm, followed by palsy. Repeated

* Revue Medicale, Juin, 1814.

blisters removed the paralytic affection, but, as soon as the blisters healed, pain returned followed by palsy. In a similar affection of the right sciatic nerve, accompanied by palsy of the limb, he found a diseased portion of nerve enveloped in a quantity of gangrenous cellular tissue. In another case he found a diseased portion of the crural nerve, which was an inch and a half in extent, enlarged to about double its natural size. This portion was of a violet red colour, and strewed throughout with small ecchymoses each about the size of a pin's head.

II. Serous or bloody effusion within the sheath of the nerve, penetrating the substance of the nerve, and separating its fibres from each other. This appearance was found by Martinet in the sciatic nerve of a man who died of pneumonia; he had been affected with violent pain in the posterior part of his thigh, aggravated by the least motion so as to make him cry out.

III. Pus effused in the same manner among the fibrils of the nerve. This was found in the sciatic nerve by Martinet, in a man who died of disease both in the head and in the abdomen, and who had been affected during the latter part of his illness with violent pain in the course of the sciatic nerve. The cellular texture surrounding the diseased portion of the nerve was also penetrated by pus. He found the same appearance in a young man who died of consumption, and who had been affected for two months with lancinating pain, and a painful feeling of numbness extending from the ham to the top of the thigh.

IV. Ramollissement of the nervous substance.—A man mentioned by Descot* died in the Hotel Dieu after he had been for six months blind of one eye. The optic nerve was found reduced through half its extent to a liquid matter of a white colour.

* Descot, Sur les Affection Locales des Nerfs.

V. Ulceration of the substance of the nerve was observed by Mr. Swan in connexion with a fungus ulcer on the leg. There had been such violent pain of the whole leg and thigh, as to render amputation necessary, and, in many parts of the limb, the nerves were found very much enlarged.*

VI. Small tumors attached to nerves, and productive of violent symptoms, have been described by various writers. In a remarkable case by Portal, a woman was cured of epilepsy by the removal of one of these tumors from the thumb. The slightest pressure upon it gave great pain, and frequently brought on an epileptic attack. The removal of such a tumor however from one of the axillary nerves by Sir Everard Home, terminated fatally; and the safer mode of treating such affections appears to be to remove the portion of nerve entirely to which the tumor is attached, when the nerve is so situated as to render such an operation advisable. Small tumors or tubercles have also been found on internal nerves. Sedillot found one in the optic nerve, in a case of amaurosis; and Berard has described a black tumor as hard as scirrhus developed in the substance of the diaphragmatic nerve. The man had been asthmatic, but he had also slight emphysema of the lungs.

These tumors are generally very small; but there is another species of tumor which grows to a considerable size. One mentioned by Mr. Pring,† the size of a pigeon's egg, was cut out from the arm, by dividing the nerve above and below. On cutting into it, an expansion of the substance of the nerve seemed to form an imperfect cyst, which contained a medullary and fatty matter, and the filaments of the nerve were continued over it. There had been great numbness and loss of power of the arm, but it gradually improved after the operation. ‡

* Swan on the Local Affections of the Nerves.
† Pring on the Nervous System.
‡ For a very full and able account of these tumors, and other

VII. Nerves have been found both very much enlarged and very much diminished in size; and they have been in a few instances found with the nervous substance destroyed, the membrane at the part forming an empty canal. But these points have not yet been sufficiently investigated.

Few opportunities have as yet occurred of ascertaining the condition of the nerve in those interesting cases of local paralysis, which have been so beautifully illustrated by Sir Charles Bell, and his lamented friend the late Mr. Shaw. It is probable that there is either an inflammatory action in the nerve itself, or its coverings; or that the nerve is affected by disease of some of the parts through which it passes. The only case in which I have had an opportunity of examining the parts, since I was acquainted with the discoveries of Sir Charles Bell, was in a woman about 40 years of age, who died of organic disease of the stomach. About a fortnight before her death, she was seized with twisting of the mouth and paralysis of the orbicularis of the left eye. She had afterwards considerable indistinctness of speech, and, before her death, there was inflammation of the left eye, with an evident tendency to sloughing of the cornea. A small hard tumor was felt under the ear, deeply seated betwixt the angle of the jaw and the mastoid process. On dissection no disease could be discovered in the brain. The tumor under the ear was found to be the size of a small bean, very firm, of an ash-colour; and, when cut across, it discharged thin puriform sanious fluid from minute cells in its substance; it lay directly above the facial branch of the portio dura; and there was considerable appearance of inflammation in the cellular structure surrounding the nerve; but I could not discover any deviation from the healthy structure in the nerve itself. I thought it was diminished in

diseases of nerves, I refer to a paper by Mr. William Wood, in the Transactions of the Medico-Chirurgical Society of Edinburgh, vol. ii.

size at the place where the tumor lay over it, but in this I might be mistaken. In a case by Descot, connected with extensive suppuration and caries of the auditory portion of the temporal bone, a part of the portio dura was entirely destroyed; and in a case by Billard, connected with an unhealthy abscess of the parotid gland, the course of several of the nervous branches was interrupted by destruction of part of their substance. An epileptic patient, mentioned by Serres, had inflammation followed by opacity of the right eye, loss of feeling of the conjunctiva, and insensibility of the right nostril, and right side of the tongue. He died of an affection of the brain; and, on inspection, the fifth pair of nerves, at its origin, was found yellow, softened, and reduced to a state almost gelatinous.

The important practical application of the discoveries of Sir Charles Bell is, that there may be paralysis of the muscles of one side of the face, producing distortion of the mouth with inability to shut the eye-lids, without disease of the brain, and consequently without danger. This affection depends upon a disease limited to the portio dura of the 7th nerve, and may be produced by inflammation of the ear or the parotid gland, or tumors compressing the nerve on any part of its course. The most common example of it seems to originate in a kind of rheumatic inflammation produced by cold, especially by exposure to a current of cold air, as when a person has sat long, or has slept, opposite to an open window, or has sat in a carriage with a cold wind blowing on one side of his head. It is to be treated chiefly by local remedies, as topical bleeding, blistering and the application of warm water or steam. In this manner it is often speedily removed, but in some cases proves tedious, and does not go off entirely for several months. The affection is of course still more untractable, or even permanent, when it depends upon a permanent cause, such as tumors compressing the nerve, or destruction of a portion of the nerve by wounds or extensive suppurations.

There is also a very formidable modification of it which depends upon disease of the temporal bone.

The character by which these cases are distinguished from paralysis depending upon disease of the brain, consists chiefly in the sensibility of the parts remaining unimpaired. The loss of motion also is confined to the muscles of the face and eye-lids, and does not affect those of the jaw. These peculiarities arise from the remarkable fact demonstrated by Sir Charles Bell, Mr. Shaw, Mr. Mayo, and others, that the portio dura of the 7th is a nerve of motion only, supplying the muscles of the face and the orbicularis of the eye, but not the muscles of the jaw; and that the sensibility of all these parts, and the motion of the muscles of the jaw are derived from the 5th, which, having a double origin, is a nerve both of sensation and motion. An important distinction, however, is to be kept in mind in regard to the paralysis of the eye-lids which occurs in these cases, namely, that it is the inability to shut the eye that arises from the affection of the portio dura of the 7th. The dropping of the upper eye-lid and inability to raise it, is a disease entirely of a different nature; it depends upon an affection of the 3d nerve, and consequently gives more reason to suspect disease within the head.

When, therefore, we find paralysis and distortion of the face, with loss of sensation of the parts, we have reason to suspect disease within the head, the portio dura of the 7th and the 5th being both affected. But when we have the paralysis without diminution of sensation, the disease depends upon an affection of the portio dura alone, and may be entirely without danger. Such cases, however, are not to be treated lightly, but the cause of them ought to be carefully investigated; for if there be any reason to suspect that the affection depends upon disease of the temporal bone, it may come to be attended with danger by inflammatory action spreading inwards to the dura mater or brain. There is another modification also which requires to be watched with anxiety, namely, when the affection is accompanied with deafness; as this gives reason to believe

that both portions of the 7th nerve are affected, and consequently to suspect an internal cause. A very interesting case of this kind occurred some years ago in the Infirmary of Edinburgh, under the care of my lamented friend the late Dr. James Gregory. Two years before his death, the man had received a blow on the right ear from a stone, after which he had a purulent discharge from the ear for six months. He then gradually lost the hearing of that ear, and about the same time the right side of his face became paralytic without any diminution of sensibility, and the action of the masseter and temporal muscles was unimpaired. Without any farther change of these complaints he died of phthisis in April 1829. The petrous portion of the temporal bone was found most extensively destroyed, leaving an excavation which contained fetid purulent matter and portions of dead bone. The 7th nerve was traced from within to the margin of this excavation where it terminated, and the portio dura, in the same manner from without, the intermediate portion being destroyed. The parts of the nerve that remained seemed entirely healthy. The brain and dura mater were sound. For some time before his death the patient suffered greatly from dyspnœa, during the severity of which the alæ of his left nostril were in strong and constant action, while those of the right were perfectly still. If this man had not been cut off by the disease of his lungs, the affection of the temporal bone would probably have terminated fatally in no long time, by inflammation of the dura mater.

I am indebted to Dr. Christison for a very important case which occurred to him in the Infirmary of Edinburgh in the beginning of the year 1829. The patient, a man of 30, was seized in the beginning of 1825 with acute pain, referred to a circumscribed spot on the left temple. About a week after he had loss of speech followed by coma. He came out of this with loss of the memory of persons, but gradually recovered, and was well in less than two months. In the end of 1827, he was again seized with pain in the temple, accompanied

by deafness of the left ear and squinting of the left eye. The deafness was permanent; the pain and squinting subsided after three or four months; but returned after two or three months more, accompanied by inability to close the eye-lids of the left side, and considerable unsteadiness in his gait. He was next affected with pain and rigid contraction of the muscles of the back of the neck and right shoulder; and these were followed by retention of urine and perfect paraplegia. He had now the usual paralytic state of all the parts supplied by the portio dura of the left side, with deafness of the left ear, distortion of the left eye inwards towards the nose, and frequent spasmodic twitches of the jaw, by which it was drawn to the right side; and he died in a state of coma in February 1829. On inspection there was found immediately behind the left temporal fossa, a thickening of the dura mater with adhesion to the arachnoid of the extent of a half-crown piece. There was a similar adhesion, with very great thickening of the dura mater above the pars petrosa of the temporal bone, and the left side of the tentorium was also very much thickened, and presented on its inferior surface several tubercular elevations. The thickening of the dura mater was greatest at the part where it is perforated by the seventh nerve, and the sixth nerve was also involved in the disease. The portio mollis of the 7th was, for a few lines previous to its entrance into the meatus, of a reddish-grey colour, and nearly gelatinous consistence; the portio dura seemed smaller than usual. In the substance of the right hemisphere, nearly on a level with the ventricle, there was a tubercle the size of a French bean; and there was a small cyst in the right corpus striatum. In the posterior cornu of the right ventricle, there was a peculiar appearance, as if a portion of it had been obliterated by adhesion, cutting off a very small cavity about the size of a lemon-seed, which communicated by a narrow opening with the ventricle, and presented at each extremity a yellowish line or raphe resembling a cicatrix. No appearance of disease could be detected in the contents of the spinal canal.

This case is one of great interest, besides the point which it is here introduced to illustrate. In particular, it presents a most important example of chronic inflammation of the dura mater, affecting three distinct portions of it, and accompanied by three distinct classes of symptoms. The intense and long-continued pain of the left temple, which was a prominent feature of the case at various periods, appears to have been connected with inflammation of a defined portion of the membrane in that situation. The remarkable affection of the functions of the seventh nerve, we may distinctly refer to the diseased condition of the same membrane where it is perforated by the nerve; and the distortion of the eye inwards, from paralysis of the abductor muscle, we trace to the sixth nerve being involved in the disease. No cause appears to which we can refer the paraplegia, except the disease of the tentorium, no morbid appearance having been discovered in the spinal cord or its membranes after the most careful examination. I have formerly referred to certain difficulties in the pathology of paraplegia, and the obscurity attending those cases in which it has been ascribed to disease within the head, from the spinal cord not having been in general examined.* Dr. Christison's case, therefore, is one of much importance in this inquiry.

The functions of the 5th nerve, as has been mentioned, appear to be, to give sensation to all the parts about the face, and motion to the muscles of the jaw; and a variety of singular phenomena arise from affections of this nerve, or particular branches of it. Thus, in the organs of sense, there may be loss of common sensation, without any affection of their proper senses depending upon their peculiar nerves. A young lady, mentioned by Sir Charles Bell, lost entirely sensation in the ball of the eye, without any diminution of vision; and there have been several instances of the membrane of the nose becoming insensible to common

* See page 267.

stimuli, while the smell was little impaired. In the same manner, there may be loss of sensation in any limited part, from disease or injury of a particular branch of the 5th, as in a striking case mentioned by Sir Charles Bell. A gentleman, after having a grinder very awkwardly extracted from the lower jaw, on puting a tumbler to his lips, to rinse his mouth, exclaimed, "You have given me a broken glass." He had lost entirely the sensation of half the lip, from destruction of the branch of the 5th, which passes along the lower jaw, and the affection was permanent. The motion of the parts, depending on the portia dura of the 7th, of course was unimpaired.*

A remarkable circumstance connected with the affections of the 5th nerve, is the tendency to inflammation and sloughing in parts which have lost their sensibility,—particularly in the eye. A very instructive case of this kind occurred to my friend Dr. Alison. The patient had loss of common sensation on the left side of the face, the left nostril, and left side of the tongue, with insensibility of the ball of the eye, and occasional bloody discharge from the left nostril; and was liable to attacks of pain occasionally accompanied with fever, during which the pain was chiefly referred to the insensible parts. There were frequently attacks of inflammation of the left eye, with dimness of the cornea, which were relieved from time to time by the usual antiphlogistic means; but at the end of two months, a line formed round the base of the cornea, which at length sloughed out, and the contents of the eye were entirely discharged. The muscles of the left side of the jaw were paralytic, and felt quite flaccid when the patient chewed or clenched the jaws, but the motion of the muscles of the cheek was unimpaired. After the destruction of the eye, the paralytic symptoms remained stationary for a year or more; there was then a violent return of headach with fever, and death in a state of

* Sir Charles Bell's Lectures, as reported in the Medical Gazette, vol i.

coma after an illness of a fortnight. On inspection, there was found considerable ramollissement of some of the central parts of the brain. The 5th nerve of the left side, on being traced backwards from the ganglion, was found, close to the ganglion, to be of a very dense texture, but beyond this it was much wasted, and at its junction with the tuber annulare, nothing but the membrane seemed to remain. In another case of Dr. Alison's, there was loss of sensation of the left side of the face, followed by inflammation and sloughing of the eye-ball; after which the sensibility of the parts returned. The patient was, before the appearance of these symptoms, and has since continued, liable to severe headach and epileptic fits. The loss of sensibility continued about six months.

A remarkable combination of symptoms occurred in a case related by Mr. Stanley.* There was hemiplegia of the left side, without loss of sensation in the arm and leg, but in the left side of the face both sensation and motion were entirely lost. In the left side of the tongue, sensation was lost, but motion remained. The mucous membrane of the left nostril was always of a deep red colour, and there were frequent discharges of blood from it. The conjunctiva of the left eye became deeply injected; this was followed by opacity and ulceration of the cornea, and at last by total disorganization of the eye. There was total loss of hearing in the left ear. There were frequent attacks of erysipelas, which were entirely confined to the paralytic parts of the face. The patient had been long affected with headach, and at last died two months after the commencement of the paralytic symptoms. A tumor was found in the left side of the tuber annulare, which compressed the origin of the 5th and 7th nerves against the base of the skull. The tumor was the size of a walnut, of a firm consistence, and brown colour, and extended into the left crus cerebelli.

* Medical Gazette, vol. i.

To affections of the nerves may probably be referred certain obscure and severe disorders of a nervous kind, some of which have supervened upon slight injuries, and others have come on without any obvious cause. A young lady mentioned by M. Verpinet,* received a slight wound with the point of a sword on the inferior and outer part of the fore-arm. It very soon healed, but most violent pain continued in the fore-arm, wrist, and hand, accompanied by convulsive motions of the arm, and loss of the voluntary power of the wrist and fingers. The affection resisted every mode of treatment for two years, and then got speedily well after the application of the actual cautery to the cicatrix of the original wound. In a lady, mentioned by Mr. Swan,† a slight wound on the thumb was followed by numbness, pain, convulsive motions of the arm, and spasms, which occasionally affected the opposite arm, and sometimes the whole body. In this case the affection seemed gradually to wear itself out, though she was not entirely free from uneasiness at the end of seven years. A very violent case of the same kind, described by Mr. Wardrop,‡ was cured after twelve months by amputation of the finger. In a similar case by Larry, which followed a wound, a portion of the nerve was removed, without complete success, though the disease was very much alleviated. In a singular case by Sir Everard Home,‖ a gentleman received a violent sprain of his thumb, by the weight of his body being thrown upon it, in saving himself when nearly thrown off, by a sudden motion of his horse. He was afterwards liable to paroxysms, in which his thumb was first bent in towards the palm of his hand; a spasm then took place in the muscles of the arm, after which he became insensible, and continued so for about a quarter of an

* Jour. de Med. vol. x.
† Swan on Local Affections of Nerves.
‡ Med. Chir. Trans. vol. viii.
‖ Phil. Trans. 1801.

hour. The attacks returned frequently in the arm, but it was found that the pressure of a tourniquet prevented the insensibility. A nerve in this case was divided without success. The tourniquet lost its effect in arresting the spasms, and he died suddenly after three months, but there was no examination of the body.

In the Medical and Physical Journal, Mr. Jeffries has described a remarkable case of a violent neuralgia of the face, which was cured by the extraction of a small fragment of china, which had been lodging there for fourteen years; and M. Descot mentions a case in which a very severe affection of ten years' standing was removed by the extraction of a carious tooth. A young lady, mentioned by Mr. Pearson, was seized, without any obvious cause, with pain in the thumb, accompanied by a morbid sensibility of the part; the affection gradually spread over the arm, and was accompanied by loss of nearly the whole muscular power of the extremity, with morbid sensibility of the integuments, and a strong contraction of the fingers, so that the points of the nails were forcibly pressed against the palm of the hand. The fingers were not under the control of the will, and every attempt made to extend them was accompanied by insupportable pain. The joint of the elbow was also contracted, and voluntary motion was nearly lost over the whole extremity. It was also very much diminished in size, while the morbid sensibility of it was inexpressibly distressing. After some time the other arm was slightly affected in the same manner, and she had likewise pain and great debility of both the lower extremities. After this affection had continued about a year, it got well under the use of a liniment composed of olive oil, turpentine, and sulphuric acid. This produced most severe erysipelatous inflammation, which, beginning upon the affected arm, extended afterwards over the whole body.*

Little has hitherto been done on this curious and interesting subject, but it certainly promises most import-

* Med. Chirurg. Trans. vol. viii.

ant results, when it shall be more extensively cultivated. For we have every reason to believe, that both the nerves themselves, and the investing membrane, are liable to affections which may be the source of many obscure diseases. It is now upwards of twenty years since I first saw a girl, aged at that time about 18 months, and previously enjoying excellent health. She had been left for some time sitting upon damp grass, and was immediately seized with fever, accompanied by such a degree of oppression as led to an apprehension of an affection of the brain. These symptoms, however, passed off in a few days, and, upon her recovery from them, it was found that she was entirely paralytic in the right lower extremity. She has from that time enjoyed uninterrupted health, and is now a tall and strong young woman, but the right lower extremity has continued entirely paralytic. It is also a great deal smaller than the opposite extremity, and several inches shorter. All the joints are remarkably relaxed, and the muscles flaccid; but there is no other appearance of disease in any part of it, or in the spine. Some time ago I was consulted about a young man, aged 14, who had nearly lost the muscular power of the upper part of both his arms, accompanied by a most remarkable diminution of substance of the principal muscles. The deltoid and biceps are reduced to the appearance of mere membranes, and the same affection extends, in rather a less degree, to the muscles upon the scapula; the muscles upon the forearm, however, are full and vigorous. No disease can be discovered about the spine, and in other respects he is in perfect health. The affection has come on gradually, and cannot be traced to any cause.

It is impossible, I think, to explain such cases as these, except upon the principle of local affections of nerves, which are at present involved in much obscurity. There are various other affections which can only be referred to the same subject, and which present some very singular phenomena, though the facts relating to them have not yet been brought together in any con-

nected form. In the year 1828 I was consulted about a singular disease of this nature, which occurred in paroxysms, and affected in the same manner two individuals of one family, a young lady of 25, and a young man of 22. The lady described the attack in the following manner. She was first affected with blindness of the right eye, which came on gradually as if a cloud passed slowly over the eye; about a quarter of an hour after this, she felt a numbness of the little finger of the right hand, beginning at the point of it, and extending very gradually over the whole hand and arm, producing a complete loss of sensibility of the parts, but without any loss of the power of motion. The feeling of numbness then extended to the right side of the head, and from this it seemed to spread downwards towards the stomach. When it reached the side of the head, she became oppressed and partially confused, answered questions slowly and confusedly, and her speech was considerably affected; when it reached the stomach she sometimes vomited. The feeling of numbness then began to subside, and as it went off, she was seized with violent headach, which continued for several hours, and left her for a day or two feeble and languid. The progress of the feeling of numbness, from the little finger to the stomach, sometimes occupied several hours, and the common duration of the whole paroxysm was about twenty-four hours. The frequency of its occurrence varied from a few days to several months; she had been liable to it for several years, but in the intervals betwixt the attacks she enjoyed perfect health. Her brother, who was 22 years of age, was affected almost exactly in the same manner, and he had been liable to the paroxysms for many years. He was a banker's clerk, and in the intervals between the attacks, enjoyed perfect health. When he felt the commencement of the attack, he hastily brought to a conclusion any business in which he happened to be engaged,—gave distinct instructions to another of the clerks in regard to the state in which he left the affairs of his department; then walked home, went to bed,

and soon after became insensible. Next day he was in his usual health, except a considerable degree of languor.

These singular cases were under the care of the late Dr. Gibson of Montrose, and they seemed to derive benefit from a course of purgatives, followed by a course of sulphate of quinine, combined with small quantities of rhubarb. In a farther report received in 1829, Dr. Gibson informed me that the affection had continued, but that the attacks had been less frequent and less severe; and that on several occasions, they seemed to have been lessened in violence and shortened in duration by emetics. In 1834 I learnt that the young man had entirely recovered; but that the lady had died of consumption in 1832, and had continued liable to occasional attacks of her peculiar headach almost to the time of her death.

The affections of internal nerves present a subject of still greater difficulty, and the observations that have been made in regard to them are at present far from being satisfactory. Lobstein* thinks he has ascertained the existence of inflammation of the great sympathetic nerve; and to this source he refers many obscure diseases, such as, violent hysterical affections, sympathetic affections of the heart, spasmodic cough, colica pictonum, angina pectoris, and many obscure affections of the stomach and bowels. In the same manner, he explains the fatal effects which are produced by blows upon the stomach, and the severe symptoms, both in the head and in the general system, which often arise from worms, and from other disorders of the bowels. In a lady who died of urgent vomiting, with burning pain in the spine and in the right hypochondrium, he found the semilunar ganglion in a state of intense inflammation, and the lower part of it livid. In a boy who died with great oppression of the chest, and distention of the epigastrium, supervening upon the retrogression of a miliary eruption, he found deep inflamma-

* De Nervi Sympathetici Fabrica, usu, et Morbis.

tion of a part of the trunk of the left intercostal nerve, and of the ninth and tenth thoracic ganglia.

These speculations must be received with much caution, especially as nothing is more precarious than morbid appearances, consisting of mere change of colour of parts, without any of the actual results or terminations of inflammation. We must forbear to speculate where we have not facts before us, but it appears extremely probable that there are diseases of internal nerves which may be the source of important morbid phenomena. Descot exposed the par vagum upon the neck of a dog, and bruised it on both sides slightly with a pair of pincers; the wound healed favourably, but the animal was affected with general tremors, difficult and laborious breathing, vomiting, great debility and wasting. The vomiting subsided, and the other symptoms were diminished, but he had not recovered a natural state of his breathing, when he was killed at the end of three weeks. The internal organs were all healthy. The nerve on the left side, where the injury had been inflicted, appeared slightly increased in size, and was of a yellowish colour; and that on the right side appeared more decidedly enlarged, highly injected, and adhering to the neighbouring parts.

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ARRANGED SELECTION OF CASES

ILLUSTRATIVE OF THE PRINCIPAL MODIFICATIONS OF

ORGANIC DISEASES OF THE BRAIN,

INTENDED TO FORM A SUPPLEMENT

TO PART III. OF THIS TREATISE.

SECTION I.

FIRST CLASS.—LONG-CONTINUED HEADACH, TERMINATING AT LAST BY COMA OR BY GRADUAL EXHAUSTION.

(*See page* 316.)

Symptoms.

CASE I.—A woman of 35—fixed pain in the back of the head—walk tremulous and unsteady, like a person balancing a burden on the head—much throbbing in the head—hysterical symptoms. Remarkable remission of all the symptoms after the formation of an abscess in the axilla; but the pain returned when it healed, and increased to tremendous severity, and with remarkable remissions. From two o'clock in the morning till two in the afternoon she was in the greatest agony, lying with her eyes closed—the eye-

Morbid Appearances.

A tumor at the base of the cerebellum, growing from both lobes of it and descending within the dura mater into the spinal canal, as low as the sixth spinal nerve. It was soft like fœtal brain, and seemed to grow out of the interior of the cerebellum. As it lay along the spinal cord, it rested upon the origin of the nerves, but did not involve them in its substance.

Dr. Latham Med. and Phys. Jour. July, 1826.

Symptoms.	*Morbid Appearances.*
brows contracted—the hands clenched—and the head immovable in one position—unable to bear the least noise, or to move a muscle. After two P. M. the symptoms gradually remitted—she took food, and about nine fell asleep, and slept till two, when the paroxysm recurred. As the disease advanced, the interval became shorter, and for a fortnight before her death the pain was constant—senses entire to the last—palsy of the left leg for three days before death—duration of the case fourteen months.	
CASE II.—A man, aged 40—violent pain in the back of the head, ceasing at times, but returning, and accompanied with vomiting, and always referred to the same spot, much relieved at different times by bleeding and by salivation, but always recurred with great violence, and was referred to a single point at the junction of the temporal and occipital bones—frequent vomiting — impaired vision. Died suddenly in one of the attacks of pain—duration of the complaint about a year.	In the left lobe of the cerebellum, a tumor an inch long and ten lines in breadth, composed of about nine alternate layers of a chalky matter, fluid albumen, and a very firm matter with the properties of albumen, which grated under the knife. It was enclosed in a cavity which also contained a tough glutinous matter, and the surrounding substance was like rancid bacon. *Prof. Nasse App. to Germ. Trans. of Dr. Abercrombie's Papers on the Brain.*
CASE III.—A young man of 20—violent pain of the forehead;—it occurred in paroxysms which generally continued four days, and were followed by intervals of partial relief of about the same duration. After two years died suddenly in the night from convulsion.	A tumor the size of a pigeon's egg, hard in the centre, and externally soft, in the substance of the cerebellum, other parts healthy. *Planque Biblioth.* III. 348.

Symptoms.	*Morbid Appearances.*
CASE IV.—A man of 50—constant pain of forehead, with frequent vomiting. Other functions healthy. Coma for three days before death. Death in three months by gradual exhaustion.	A tumor two inches long arising from the cella Turcica, covered by the dura mater. Ventricles distended with serum. *Communicated by Mr. William Brown.*
CASE V.—A man, aged 55—lancinating pain in the right side of the head—aggravated at intervals. After two months coma and death.	A mass as hard as scirrhus, four inches long, and between two and three broad, in the substance of the right hemisphere, on the outside of the thalamus. Internally it contained small cells full of gelatinous matter. *Bouillaud Traité de l'Encephalite.*
CASE VI.—A boy of 14—severe headach for two months—then convulsion, followed by coma and death on the 8th day.	A tumor the size of a walnut of a rose colour and a fatty consistence behind the posterior part of the medulla oblongata; another smaller in the left lobe of the cerebellum. Serous effusion — diseased mesenteric glands—ulceration of the small intestines. *Merat Journ. de Med.* tom. X.
CASE VII.—A man, aged 35—violent headach, which was sometimes so severe as to oblige him to remain for a considerable time in one posture, incapable of the least motion—consumptive symptoms—death after seven months in a state of complete marasmus.	Three ounces of fluid in the ventricles, a firm tumor the size of a pigeon's egg in the upper and middle part of the right hemisphere, enclosed in a reddish sac, internally of a yellowish colour. A larger tumor of the same appearance in the left lobe of the cerebellum—extensive disease of the thorax and abdomen. *Merat, ut supra.*
CASE VIII.—Man of 58—liable for 15 years to attacks of acute pain in the right temple, extending over the right side of	On the outside of the right thalamus, and on a level with it, a tumor in the substance of the brain of a reddish-grey co-

Symptoms.	*Morbid Appearances.*
the head and face—first attack continued three weeks—and it afterwards returned in paroxysms of very uncertain duration, and at very irregular intervals. After fifteen years, a more severe attack, which continued two months and ended in coma and death. For some days before death, had palsy of the left side, and of the right eyelid.	lour—four fingers breadth in length, and two or three in breadth, partly hard, and partly in cyst containing a gelatinous matter. *Andral. Jour. de Phys.*
Case IX.—An officer, aged 33—slight pain and confusion of the head with impaired appetite. After ten weeks, nausea and pain in the eye-balls. He was then wounded in the head—lost much blood, and the bone exfoliated, and he was much better for more than a year. Then headach—watchfulness—flushing—and ophthalmia. Recovered after three months, but was never free from headach. It gradually increased; was sometimes referred to a spot on the occiput, and sometimes through the whole head. Was much aggravated by motion, which produced a painful jarring in his head, and much increased by going to stool—pain at last excruciating, with numbness of the left hand—then sudden delirium—coma and death in three days—duration of the complaint three years.	Three ounces of fluid in the ventricles—in the seat of the pineal gland, a little to the right side, a tumor the size of a nutmeg—internally it was like cheese, but organized. Ramollissement of the cerebellum. *Sir G. Blane, Trans. of a Soc.* vol. ii.
Case X.—A woman of 40—severe shooting pain in the occiput—at first alleviated towards evening—afterwards unremitted. Constant sickness,	A soft tubercular mass the size of a hazel-nut in the posterior lobe of both hemispheres—left lobe of the cerebellum almost destroyed by the soften-

Symptoms.	*Morbid Appearances.*
and afterwards vomiting of every thing taken. Death from gradual exhaustion in four months.	ing of a similar tumor occupying its interior—substance of the cerebellum around it indurated. Three ounces of fluid in the ventricles. *Dr. Chalmers Med. and Phy. Jour. July*, 1826.

It is unnecessary to multiply cases of this class, which present little variety in the phenomena. In a case by Willis, there was a tumor three inches broad adhering to the membranes at the side of the third sinus; and in one by Saviard there was, under the junction of the lambdoidal and sagittal sutures at the broadest part of the falx, a small triangular piece of bone with very sharp angles. Where these angles came in contact with the dura mater, it was livid and discharged a little pus. In a lady mentioned by Borellus there was, near the torcular, a hard rough irregular mass of a stony consistence, with many sharp processes and angles; and in a case by Schenkius there was a stony tumor like a mulberry in the brain of a man who had suffered from long-continued and intense headach, which left him no interval of ease day or night. See also the cases formerly described under the head of tubercular diseases of the brain, particularly Cases LXXXIII, LXXXV, and XC, which exhibit examples of organic diseases, with remarkable remissions of the pain.

SECTION II.

Second Class.—Headach, affections of the senses, speech or intellect.

Symptoms.	*Morbid Appearances.*
Case XI.—A man, aged 42—after exposure to the sun by walking in a procession without his hat was seized	At the anterior part of the right hemisphere, a scirrhous mass the size of a nut, surrounded by extensive ramol-

Symptoms.	*Morbid Appearances.*
with headach, which became intermittent, and was treated by bark. After six weeks it ceased, but left amaurosis. Then followed fever and death.	lissement of the cerebral substance—thalami sound—optic nerves shrivelled, *Cruveilhier Nov. Bib. de Med. Nov.* 1825.
CASE XII.—A man, aged 47—headach and weight in the head, increased by stooping. Began in May 1816, and increased gradually, notwithstanding copious evacuations. In August his sight began to diminish, with giddiness, in September, could only see objects in a very strong light; in December perfect blindness—pain still constant and severe. In the middle of January stupor and forgetfulness, and died comatose on the 31st.	A tumor, the size of a large egg, attached to the tentorium in such a manner, that part of it lay above it and part below it, the falx likewise entering into its substance above. Internally it was firm, and resembled the structure of the kidney—four ounces of fluid in the ventricles. *Author's Notes.*
CASE XIII.—An officer who had seen much service—severe headach which subsided, and left a feeling of tightness across the forehead After six or eight months, blindness of the right eye, then blindness of the left. Under the operation of an emetic, the sight of the left eye was recovered for an hour—afterwards perfect blindness and pupils insensible, but no other complaint, except disordered stomach, and frequent inclination to vomit. Death from coma after two years.	Four ounces of fluid in the ventricles; a tumor, the size of a hen's egg, containing a thick purulent fluid, under the anterior part of the brain, and interposed betwixt the optic nerves, which were much separated by it from each other. Below it was attached to the pituitary gland, which was very soft, and enlarged to five or six times its natural size. *Med. Trans.* vol. v. *Dr. Powel.*
CASE XIV.—A man aged 30—excruciating headach, which commenced after hard working in a hay-field—chiefly referred to the forehead, from which it extended over the left ear, but sometimes affected the right	A tumor, the size of a large walnut, projected from the lower part of the anterior lobe of the left hemisphere. Internally it resembled an absorbent gland. The greater part of the medullary substance of

Symptoms.	*Morbid Appearances.*
side of the head also, and occasionally the neck—more severe in the night. After six or seven weeks blindness. At the end of two months an apoplectic attack, and death in two days.	the left hemisphere was reduced to a soft pulpy state, and was of a light brown colour. *Med. Trans.* vol. v. *Dr. Powel.*

In the other cases of this class the symptoms are nearly similar,—fixed pain in the head and gradual loss of sight,—the intellect being frequently affected in the advanced stages, and frequently the speech impaired. A case has been already described, in which there was blindness of one eye and loss of speech, in connexion with a cyst containing albuminous matter in the posterior part of the left hemisphere—(See Case XCI. page 174.) In a case by Platerus, fatal by gradual wasting, there was a tumor larger than an egg, compressing the origin of the optic nerves. In one by Drelincurtius, there was a steatomatous tumor the size of a fist between the brain and the cerebellum. In this case there were both blindness and deafness, and it was fatal suddenly by an apoplectic attack. In another by the same writer the pineal gland was enlarged to the size of an egg, and was of an earthy or stony structure. In a case by Bouillaud, with impaired sight and speech, and loss of the memory of names, there was a tumor the size of a large nut in the anterior part of the left hemisphere.

SECTION III.

Third Class.—Headach—affections of the senses and convulsions.

Symptoms.	*Morbid Appearances.*
Case XV.—A girl, aged 11—long liable to headach, with weakness of sight, and a pecu-	A tumor the size of a walnut rested on the cella Turcica, and compressed the junction of

Symptoms.

liar tenderness of the integuments of the head. In autumn 1814, she received an injury on the forehead from a fall, and from that time suffered much from headach, with frequent epistaxis. In the end of December, the headach increased, with fever, intolerance of light and sound—squinting and convulsive paroxysms, which, for some time, recurred every half hour. In March 1815, she improved remarkably, and for nearly a year continued better in regard to the head-symptoms, but affected with scrofulous sores on the neck and on the leg. In May 1816, headach increased, with impatience of light and sound—squinting, gradual failure of sight, at last blindness in July. She died in October, her intellect having continued unimpaired; remarkable acuteness of hearing, and intolerance of sound continued to the last.

Morbid Appearances.

the optic nerves. It was composed of a medullary substance of a yellowish colour, and was covered by a thin and delicate membrane.

Communicated by Dr. Hay.

CASE XVI.—A young man of 15—deep-seated pain in the head, and after six months inarticulate speech. Three attacks of convulsion, each of ten or fifteen minutes duration; the last left palsy of the right side, which disappeared next day. Died comatose in another month, having had repeated convulsive attacks, intense headach, impatience of light, afterwards dilatation of the pupils, deafness, palsy of the eyelids, very difficult articulation, and some delirium.

Four ounces of fluid in the ventricles; on the left side of the pons Varolii, a hard tumor the size of a bean; surrounding substance softened, approaching to suppuration.

Coindet sur l'Hydrenceph p. 98.

Symptoms.	*Morbid Appearances.*
CASE XVII.—A servant girl long subject to headach, which, in her 19th year, became very severe, and occurred periodically, generally once in four weeks and sometimes oftener. In her 21st year, the headach became more violent and permanent, with frequent vomiting, and occasional fits of insensibility. She had then attacks of double vision, and afterwards convulsions, which returned at first in five or six days, and afterwards every second or third day. About three months after the commencement of the convulsions, she was one morning found dead in bed.	Throughout the substance of both hemispheres, and in the corpora striata, there were numerous tubercles the size of peas. They were externally hard, and internally contained a small cavity full of a thick greenish fluid. Twenty-one of them were collected—substance of the brain healthy—corpora striata considerably softened. *Prof. Nasse, ut supra.*
CASE XVIII.—A woman, aged 19.—Headach, vertigo, suffusion of the eyes; paroxysms in which she fell down insensible, without convulsion. They attacked her once in three weeks, and at each time there were two paroxysms at the distance of twelve hours; after eight or nine months, these attacks increased in severity. She had then loss of hearing, sight, and smell, and her speech and deglutition were much impaired. Soon after this died apopletic.	Embedded in the substance of the right hemisphere, there was an hydatid, three inches long, and two broad, and very vascular. Brain in other respects healthy. *Yelloly, Med. Chir. Trans.* vol. ii.
CASE XIX.—A man aged 24,—severe headach—watchfulness and imbecility of the head—blindness of the left eye, and after a month of the right. Convulsive paroxysms which continued to recur for six months; they then ceased, and he died of pectoral complaints.	Extensive disease of the lungs; much effusion in the brain; in the substance of the left hemisphere, a tumor larger than an egg, weighing fourteen drams; it was covered by a fine sac, and internally was white, firm and uniform, resembling coagulated albumen, but harder. *Felix Platerus, Lib. I.* 108.

Symptoms.	*Morbid Appearances.*
CASE XX.—A child of 4 years—unable to walk—articulation very imperfect—intelligence very deficient—deglutition very difficult, liquids swallowed often returning by the mouth and nose—difficult respiration and frequent convulsions—but was full in flesh—had been in this state about a year—died in six months more.	Corpora olivaria, crus cerebelli, and tubercula mammillaria in a state of cartilaginous hardness; other parts sound. *Author's Notes.*
CASE XXI.—A woman, aged 23—After suppressed menstruation, violent headach, impaired vision, and after some time blindness. Repeated convulsive attacks; after one of which she lost her speech for two days. Intellect entire. Died comatose after four months.	On the surface of the right hemisphere there were three hardened spots, each an inch in diameter. They were the surfaces of tubercular masses, which extended into the medullary substance of the brain. There was a similar tubercle in the substance of the hemisphere, and one smaller in the surface of the left hemisphere. Slight effusion in the ventricles. *Powel, Med. Trans.* v.
CASE XXII.—A lady, aged 40, of a scrofulous habit—gradual failure of memory, sight and hearing; inarticulate speech; epileptic paroxysms, at first once in the fortnight, afterwards more frequent—her gait feeble and tottering—died in six months. A year before her death, she had been much stunned by a fall down a stair.	A tumor, the size of a small orange, lay on the pars petrosa of the left temporal bone, inclining to the opposite side, and producing great depression in the substance of the brain; the seventh pair of nerves, and the branches of the fifth pair were compressed and stretched by the tumor. Internally it consisted of a soft uniform substance resembling the cineritious matter of the brain. *Communicated by Dr. Hay.*
CASE XXIII.—A man, aged 26—Severe headach; most distressing when lying on the left side; occurring in paroxysms with giddiness. After several	A hard tumor two inches long, and an inch and a half broad, was firmly attached to the tentorium, and embedded in the posterior lobe of the left

Symptoms.	*Morbid Appearances.*
months pain increased, with impaired vision and dilated pupil. Paroxysms of giddiness, with blindness; loss of speech, stiffness of the limbs during the paroxysms; then double vision; violent pain in the neck, with convulsive paroxysms, affecting the muscles of the neck, and drawing the head violently backwards. Two months after this he had numbness and spasmodic motions of the superior extremities. After seven or eight months died suddenly in a fit resembling epilepsy.	hemisphere. It contained an ounce of greenish pus, and the cerebral substance near it was softened. Where the tumor pressed against the occipital bone, the dura mater was obliterated, and the bone rough. Two ounces of fluid in the ventricles. *Clerk, Edin. Jour.* VI. p. 275.
Case XXIV.—A man aged 35—Severe headach, and sense of weight in the head for two years; copious epistaxis; loss of the sense of smell; then frequent epileptic paroxysms for two years—died suddenly.	Cerebral substance on the anterior part of the right hemisphere was hard and callous, and adhered intimately to the dura mater; on the left side some extravasated blood. *Morgagni, Epis. 9.*
Case XXV.—A man, (age not mentioned)—severe headach, followed by amaurosis and epileptic paroxysms, which occurred almost daily. He died in an apoplectic attack.	On the inner surface of the left parietal bone, there was an osseous spongy tumor, three inches broad, and more than an inch in thickness. *Wepfer.*

SECTION IV.

Fourth Class—Convulsions, without affections of the senses.—Intellect sometimes impaired.

Case XXVI.—A man, aged 60—Epileptic for six years,	An hydatid the size of a pigeon's egg, in the posterior

Symptoms.

with loss of memory. Died suddenly.

Morbid Appearances.

part of the right hemisphere. It contained a yellowish fluid, which was partly gelatinous. The substance of the brain under it was hardened.

Lancisi de Sub. Mort. cap. 11.

CASE XXVII.—A boy, aged 16 months, formerly healthy, was seized with an attack of convulsion. It affected chiefly his right side, which was very strongly convulsed. He had a second attack on the evening of the same day, after which he had fever, blindness, and loss of the power of deglutition. In this state he continued ten days, when he had another fit, and after this he gradually recovered his sight and deglutition. From this time there was a degree of paralysis of the right side, but in other respects he enjoyed good health for four years. He then had epileptic paroxysms, which at first occurred once in two months, but gradually increased in frequency. After a much longer interval than usual, a few weeks before his death, the fits returned after a fright, recurred with great frequency, and were fatal. He was then twelve years of age; his right side had continued weak; and at the time of his death, the right lower extremity was three inches shorter than the other; —his intellect had been weak, so that he never could be taught to read.

On the surface of the brain, under the left parietal bone, there was a tumor the size of an egg, situated between the pia mater and the arachnoid; internally it was of a white and somewhat gelatinous appearance, but very firm, and when cut into, some serous fluid was discharged from it; no effusion.

Communicated by Dr Beilby.

CASE XXVIII.—A man, aged 40, the guard of a coach, was thrown from his seat behind the coach, and received an injury of his head, by which he

There was thickening of the dura mater in several places. Attached to the inner surface of the thickened portions, there were several small nodules of

Symptoms.	*Morbid Appearances.*
was confined for several weeks. After his recovery he became epileptic. The fits generally occurred once in five or six weeks. After two years he fell from his seat behind the coach in one of the fits, and received various injuries, of which he died in a few days.	bone, the size of peas, and very irregular on the surface. *Communicated by Dr. Hunter.*
Case XXIX.—A child aged 20 months—No symptom remarked but a constant motion of the head from right to left—was pale but without fever, and did not seem to suffer. Died emaciated.	In right lobe of the cerebellum a round firm cyst, the size of a hazel-nut, containing numerous small hard concretions like pieces of bone. *Andral.*
Case XXX. — A woman aged 50 — Epileptic for thirty years; had cough which excited acute pain under the upper part of the occipital bone. In one of the epileptic fits she received a violent blow on this spot, followed by constant pain, and after six weeks, a pulsatory tumor appeared on the spot, which could be pressed back into the cavity of the cranium, and this produced coma. After several months, she had palsy of the right arm, and both lower extremities, and soon after died.	The tumor was generated in the substance of the dura mater. It projected inwards into a hollow on the left hemisphere, and outwards through an opening in the bone which measured two inches by one and a half. The dura mater near it was remarkably vascular. *Marigues. Mem. de Chir.* p. 26.
Case XXXI. — A woman of 43—Headach; spasmodic affections of the limbs. After seven months was confined to bed—violent paroxysms of headach, with loss of memory, and frequent convulsive attacks, which at last occurred several times a day. Died suddenly in one of them, six or seven weeks after she was confined to bed.	Four ounces of fluid in the ventricles. A tubercle the size of a nut in the left lobe of the cerebellum; surrounding substance much softened. *Rochoux sur l'Apop.*

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

epileptic affections. He had violent headach for three months, then violent convulsions, which were rapidly fatal. The longitudinal sinus, externally and internally, was covered with innumerable smaller glandular grains, and similar bodies were found on the choroid plexus. In the fourth ventricle there appeared a tumor the size of an egg, formed by a congeries of innumerable glandular bodies, verging to suppuration. Nearly the whole of the cerebellum had the same appearance.

SECTION V.

Fifth Class.—Symptoms in the head with paralysis.

§ 1.—Hemiplegia.

Symptoms.

Case XXXII.—A woman of 77—violent convulsions of the left arm, which returned every two or three days for ten weeks, with weakness of the arm, then weakness of the leg, and gradually complete hemiplegia, the convulsion then ceasing—speech then lost, but mind entire—death after eleven months without any other symptom.

Morbid Appearances.

A hard yellow cancerous mass, larger than a duck's egg, and composed of many lobes in the substances of the right hemisphere.

Rostan, (Ramollissement de Cerveau.)

Case XXXIII.—A boy, aged 11—sudden attack of dimness of sight amounting to blindness. It went off in a few minutes, but from that time his sight was gradually impaired, and after a year was nearly lost. He then had an affection resembling chorea; and after a

On the surface of the left hemisphere, the membranes adhered firmly to the surface of the brain in the middle lobe—on raising them at this place, fluid escaped in great quantity, which was found to have been discharged from the cyst of an immense hydatid contained

three days. This was followed by hemiplegia of the right side. He complained much of his head, which appeared to his friends to enlarge; and he sometimes lost his speech for two or three days. His intellect was not affected, but at times was extremely acute. He died after coma of five weeks continuance, about a year after the attack of hemiplegia, and two years after the commencement of the disease.

to the circumference of the brain. It contained about sixteen ounces of limpid fluid, and besides this, there were several ounces in the proper cavity of the ventricle.

Communicated by Mr. Headington of London.

CASE XXXIV.—A man of 63—after a blow on the head, headach and sense of weight in the head, at first occurring in paroxysms, then more permanent, with slight weakness of the right side and transient loss of recollection. Symptoms gradually increased to perfect hemiplegia of the right side—loss of speech—twisting of the mouth to the left, and great failure of intellect. Died comatose after more than two years. The coma continued a week.

A reddish-brown and firm tumor, the size of an egg, on the outer and anterior part of the left hemisphere; it was full of blood, which seemed to be contained in it in some places as it is in the spleen; in others it was in small clots a line or more in diameter, and very firm. The tumor adhered slightly to the dura mater and the arachnoid, which was red and thickened where it covered the tumor. Below it was embedded in the substance of the hemisphere, and the cerebral matter was softened. One ounce of fluid in the ventricles.

Rochoux.

CASE XXXV.—A boy of 13—headach—hemiplegia of the left side for five or six weeks before death—loss of speech and memory—rigidity of the paralyzed limbs—occasional pain in the affected leg, and tremulous motions of both arms—tetanic symptoms.

A tubercle the size of a large egg, and five or six smaller ones in the substance of the right hemisphere; four in the left the size of chesnuts—several of them suppurated—pus betwixt the arachnoid and pia mater, and turbid fluid in the ventricles.

Bouillaud.

Symptoms.	*Morbid Appearances.*
CASE XXXVI.— A man, aged 36—occasional attacks of severe headach, shooting from behind forwards. After a few months double vision — then gradually palsy of the right side, with distortion of the mouth and inarticulate speech ; the left eye drawn towards the nose—pulse natural. About two months from the commencement of the paralysis, he became convulsed, and died in twenty-four hours.	A tumor, the size of a hazel-nut, lying on the left side of the tuber annulare, and sunk into it. It extended to the left corpus pyramidale, compressing it and the abductor nerve, and was closely attached to the basilar artery, which contained at this place a small coagulum, and its coats were very soft. The tumor was in a state of imperfect suppuration. *Yelloly, Med. Chir. Trans. I.* 181.
CASE XXXVII.— A girl, aged 6½—gradual loss of power of right arm and leg, with great rigidity—squinting—loss of articulation—difficult deglutition —palsy of left side of face. Limbs of left side afterwards affected, though in a smaller degree than the right—afterwards difficult respiration— complete loss of power of deglutition. Death in five months.	Tuber annulare enlarged and lobulated, and changed into a gelatinous mass with white bands running through it. Effusion in the ventricles. *Bright.*

The cases of this class present little variety in the symptoms. They are generally, headach with or without affections of the sight, and after some time weakness of one side, which gradually increases to perfect paralysis. In a case by Bonetus, and in another exactly similar by Blancardus, there was a tumor three inches long attached to the side of the third sinus. A gentleman, mentioned by Mr. Gooch, along with a variety of nervous symptoms, had an excruciating pain of one arm, beginning at the finger ends, and gradually ascending as high as the insertion of the deltoid. The arm at last became paralytic, and soon after he died of convulsion. Two small encysted tumors were found in the surface of the brain on the opposite side from the af-

fected arm. In a case by Bouillaud, with partial hemiplegia of the right side of long standing, with much derangement of speech and weakness of mind, there was a tumor the size of an egg in the anterior lobe of the left hemisphere, and another smaller in the middle lobe. They were internally cellular, and contained blood mixed with a filamentous substance, and a matter resembling concrete pus.

§ II.—Paraplegia.

Symptoms.

Case XXXVIII.—A man of 48—acute headach for a year followed by paraplegia. Five months after died suddenly.

Morbid Appearances.

Left lobe of the cerebellum was almost entirely scirrhous, of a pale flesh-colour, and seemed to be composed of numerous small corpuscles closely compacted, without any interstices, or any appearance of vessels.

Morgagni, Ep. 62.

Case XXXIX.—A man of 35—fixed pain in the occiput extending down the neck—occasional vertigo and sickness. After five months hemiplegia of the left side and impaired vision. Hemiplegia diminished gradually, and after five or six months more, became liable to fits of stupor, which were preceded by violent pain and vertigo, and occurred occasionally twenty times in a day—blindness of the right eye—failure of memory—then paraplegia, and a fortnight before his death palsy of the upper extremities also.—Duration of the complaint was a year and eight months.

On the surface of the pons Varolii, there were two triangular fleshy tumors nearly united by their apices. The base of the one extended into the right crus cerebri, that of the other into the medulla oblongata. The disease penetrated into the substance of the pons. There was much effusion under the arachnoid.

Edin. Jour. XI. 470.

Symptoms.

CASE XL.—A man, aged 63—general and complete paralysis of the whole body, which came on gradually and insensibly, without any evident cause—speech indistinct—mind entire to the last. Died of gangrene of the nates.

Morbid Appearances.

A tumor the size of a hen's egg in the medullary substance of the left hemisphere, betwixt the fissure of Sylvius and the part which rests upon the tentorium. It was contained in a cyst, and was internally of a brownish colour and lardy consistence.

Bul. Fac. Med. May, 1816.

I have already alluded to the uncertainty which attends cases of this class, from the circumstance of there having been in general no examination of the spinal cord; and perhaps it may still be considered as a point not absolutely ascertained, whether disease in the brain produce paraplegia without any affection of the cord. If this does take place, it will probably be in those cases in which the disease is about the pons or medulla oblongata; though in these cases one should rather expect universal paralysis, such as occurred in Cases XXXIX. and XL., of this Supplement. From the observations recorded under the pathology of the spinal cord, it will appear that disease may frequently exist both in the brain and in the cord at the same time, and that this particularly is true of tubercles. In a case related by Dr. Hawkins in the Medical and Physical Journal for 1826, there were numerous scrofulous tubercles, both in the brain and cerebellum in a man of 23; the symptoms had been fits resembling epilepsy, with dysuria, partial paraplegia, and impaired speech and vision. He died after four months, having been comatose for three or four days before death. Had the spinal cord been examined in this case, it is very probable that tubercular disease would have been met with in it also. The same observation applies to a case by Bouillaud, in which there was paraplegia with loss of speech and intellect, in connexion with a tubercular mass, the size of a turkey's egg in the anterior part of the right hemisphere. A girl, aged 14, mentioned by Lallemand,

had hemiplegia of the right side, of which she recovered; four months after she had paraplegia with loss of feeling, which extended over the abdomen and the thorax; she died in sixteen days. There was remarkable induration of a small part of the left lobe of the brain, on the outside of the ventricle, and in the vertebral canal there was extensive extravasation of blood with ramollissement of the cord at the seventh cervical vertebra.

SECTION VI.

Sixth Class.—Prominent symptoms in the digestive organs.

Symptoms.

Case XLI. — A medical man, in the meridian of life, had been for a year liable to attacks of dyspepsia, with headach. In October 1815, he had severe headach with fever, relieved by blood-letting; then complete want of digestion, headach, general emaciation, and frequent vomiting, which occurred chiefly in the morning. He had various uneasy feelings, which he referred to his liver, and his complaints were ascribed to this source by the most eminent practitioners whom he consulted. In August 1816, he had severe headach, and nothing agreed with his stomach; almost every thing being vomited. After some time the pain was relieved, but the morning sickness and vomiting continued, with increasing emaciation, torpid bowels, frequent

Morbid Appearances.

Four ounces of fluid in the ventricles. On the inferior part of the left lobe of the cerebellum, there was an encysted tumor, the size of a French walnut, besides a vesicular portion connected with it, containing some yellow serum. The tumor was invested both by the dura mater and pia mater, and was attached by a small pedicle to the substance of the cerebellum, where it had formed a depression in which it was embedded. On the corresponding part of the opposite lobe there was a small florid tumor, the size of a large pea. The abdominal viscera were sound.

Med. Repos. vol. vii.

Symptoms.	*Morbid Appearances.*
eructations, and hiccup. In the end of September had twice a slight convulsion. Headach then periodical—mind entire, but conversation induced headach, and sometimes convulsion. October 9, died suddenly in convulsion.	
CASE XLII.—An officer, aged 27—constant nausea and frequent vomiting — slight thickening of the pericranium —headach and general indisposition. After a considerable time, numbness of the right side. Five weeks after this, he died suddenly in the night.	The dura mater covering the cerebellum at its posterior and inferior part was thickened and cartilaginous, and the diseased state had extended considerably into the substance of the cerebellum, where it lay in contact with it. Other parts of the cerebellum softened, membranes of the spinal cord hard and thickened. Thoracic and abdominal viscera sound. *Med. Repos.* vol. viii.

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

various complaints in the head and bowels, which were ascribed to worms. After some time he had attacks of stupor and forgetfulness, and died delirious. The only morbid appearance was ossification of no great extent in the dura mater, with appearances of inflammation in the adjoining membranes. Similar ossification in the falx was found by Dr. Lettsom, as the only morbid appearance in a gentleman who had been long affected with a train of obscure complaints, the most urgent of which were obtuse headach, with frequent vomiting. (Mem. Med. Soc. of London, vol. iii.) On the other hand, it is to be kept in mind that similar ossifications have been met with in cases in which there existed no symptoms that could be ascribed to them. This part of the subject, therefore, is involved in much obscurity.

SECTION VII.

Seventh Class.—Vertigo and apoplectic symptoms—slight and transient apoplectic attacks.

Symptoms.

Case XLIII.—A man, aged 73—headach, with occasional attacks of giddiness, and loss of recollection. He did not generally fall down, but sometimes continued walking, without knowing whither he was going; at other times the attack resembled intoxication; his gait was feeble and tottering, and the attacks gradually increased in frequency and violence, though he generally recovered his recollection in a very short time; but at length, after six months, a more severe

Morbid Appearances.

Three ounces of fluid in the ventricles, cerebral substance very firm. In the posterior lobe of the right hemisphere, there was a firm tumor the size of a small pigeon's egg; internally of a pale flesh-colour, and granular texture. It was not enclosed in a capsule; but, for a considerable part of its circumference, was covered by a texture resembling the fibrous bands of carcinoma. The tumor communicated with the ventricle so as to form part of the wall of the posterior and

Symptoms.

attack occurred, from which he did not recover; he was now confined to bed with severe headach, giddiness, loss of memory, and incoherence; and about the 12th day had severe pain and partial palsy of the left leg and arm. He had then general convulsion, followed by perfect hemiplegia and coma, and died about the 23d day of his confinement.

Morbid Appearances.

inferior cornua, and the margin of the pes hippocampi was attached to it. The pia mater lining the ventricle at this place was very vascular.

Communicated by Dr. Hunter.

CASE XLIV.—A man, aged 36—after a wound in the head, which healed readily, had constant headach for five years and a half; then fits of stupor, which came on at uncertain intervals, sometimes twice a week, sometimes once a fortnight. They generally lasted about an hour and a half, and he had warning of their approach so as to lay himself down. In the intervals all the functions were natural. After seven or eight months, the paroxysms became more frequent, and he died suddenly in one of them.

A scrofulous tumor, larger than a hen's egg, in the middle of the left hemisphere of the brain, extending in depth to nearly on a line with the corpus callosum. It seemed to be merely a part of the brain in an indurated state. A piece of bone, the size of the finger-nail, was attached to the left side of the longitudinal sinus. The veins on the left hemisphere were more distended with blood than those on the right.

Med. Chir. Trans. IV. 188.

CASE XLV.—A woman, aged 28, severe headach, constant vertigo, nausea, occasional vomiting, frequent rigors, pain and deafness of the left ear, and the left eye somewhat affected. After several months the headach increased, with occasional paroxysms of coma, and she died at last rather suddenly, having been for a day or two affected with extensive erysipelas of the head and face.

A remarkable tumor under the base of the brain on the left side, resting on the petrous portion of the temporal bone. It consisted of three portions; the anterior was the size of an egg, of a pink colour, and composed of a spungy vascular substance, like the texture of the placenta, interspersed with small cysts, containing a puriform fluid; the posterior portion was half the size of the former, and of similar structure, but firmer; the

and nearly cartilaginous structure. The petrous portion of the bone on which the tumor rested was absorbed to the depth of half an inch.

Author's Notes.

CASE XLVI.—A lady, aged 64—attacks of headach; giddiness and imperfect vision, occurring at uncertain intervals; afterwards mania; at last, after five years, death with fever and delirium.

Two small aneurisms, each about five-eighths of an inch in diameter, formed by dilatation of the internal carotid arteries, by the side of the cella Turcica, and containing laminæ of coagulated blood.

Trans. of a Soc. II. 193.

CASE XLVII.—A woman, aged 65—palsy of the right leg, of long standing; lancinating pains of the head, occurring at intervals; attacks of insensibility; death from gradual coma after an apoplectic attack.

Extravasation of blood and ramollissement. The anterior part of the left hemisphere was very much hardened, and of a reddish colour. In the substance of the right hemisphere there was an oval tumor of a reddish colour, partly hard and partly softened. *Rostan.*

I have formerly described a very important case referable to this class, connected with a remarkable tumor formed by a deposition of new matter betwixt the laminæ of the dura mater,—(see Case VI. page 44,) and there are many others on record exhibiting some varieties of the symptoms. In some we find constant uneasiness, with vertigo; in others, transient apoplectic attacks, while the patient in the intervals enjoys tolerable health. In other cases again, there is a constant complaint of slight and habitual giddiness, commonly called weakness of the head, often accompanied by unsteadiness of the limbs. In a case of the first kind, by Zeder, he found numerous hydatids in the brain, one particularly, in the passage to the aqueduct of Silvius, and containing within it three smaller hydatids. The case

which I have just referred to (Case VI.) affords a remarkable example of the other class of cases distinguished by transient apopletic attacks; and I have quoted from Lancisi the case of a gentleman who had apopletic attacks, connected with thickening of the membranes, and a polypous tumor under the frontal bone. A gentleman, mentioned by Gooch, had been for several years liable to attacks in which there was sometimes a shaking of the head, and a kind of emprosthotonos; at other times he became vertiginous, and fell down, deprived of sense for a short time. He was never entirely free from headach, and brisk exercise excited giddiness, which went off immediately upon resting. He died suddenly in convulsion, and there were found several osseous points arising from the right parietal and occipital bones, and irritating the dura mater, which was inflamed, and beginning to mortify.—(Gooch's Appendix, p. 237.)

To this class also belong the cases in which, connected with organic disease of the brain, there has occurred a gradual loss of the mental faculties with little complaint of pain, or any urgent symptom. In a case of this kind, which terminated in perfect stupidity or lethargy, Platerus found a firm fleshy-looking tumor the size of a moderate apple, above the corpus callosum. In a similar case, by Bouillaud, there was a steatomatous encysted tumor in the right hemisphere.

FINIS.

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