History and method of cure of the various species of palsy : being the first part of the second volume of A treatise on nervous diseases / by John Cooke.

HISTORY

AND

METHOD OF CURE

OF THE VARIOUS SPECIES OF

PALSY:

BEING

THE FIRST PART OF THE SECOND VOLUME OF

A TREATISE ON

Nervous Diseases.

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ON

NERVOUS DISEASES.

OF PALSY.

CHAP. I.

Definition, Distinction, and General History.

In the first volume of this work, I have given an account of the opinions of the most celebrated medical authors, both ancient and modern, respecting the symptoms, causes, nature, distinctions, and treatment of apoplexy.—I now proceed to a similar consideration of palsy, a nervous affection which is a very common consequence of apoplexy.

The ancients very generally considered apoplexy and palsy as diseases of the same nature, but different in degree; apoplexy being an universal palsy, or palsy a partial apoplexy. Aretæus says apoplexy, pa-

raplegia, paresis, and paralysis, are all of the same kind; consisting in a loss of sensation, of mind, and of motion. Apoplexy is a palsy of the whole body, of sensation, of mind, and of motion.* And on this subject Galen, Alexander Trallianus, Ætius, and Paulus Ægineta, agree in opinion with Aretæus. — Hippocrates, who in various parts of his works speaks of apoplexy, no where, as far as I know, mentions paralysis; and when he refers to this disease, he employs the term *apoplexia.* Both Aretæus and Paulus Ægineta represent him as speaking of apoplexy in the leg. Celsus describes palsy and apoplexy by the general terms *resolutio nervorum.*

Palsy has been variously defined by modern writers. It has been denominated an impotence of motion; a lax immobility not to be overcome by any effort of the will†;

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* Αποπληξιη, παραπληγίη, πάρεσις, παράλυσις ἅπαντα τω γένεϊ τωυτά. Η γὰρ κινήσιϴ ἡ ἀφῆς ἡ ἀμφοῖν ἐςι ἔκλειψις· Αλλ' αποπληξίη μὲν ὅλου του σκήνεϴ, καὶ της ἀισθήσιός τε καὶ γνώμης, καὶ κινήσιϴ ἐςι παράλυσις. *Aret. de Caus. et Sign. Diut. Morb.* lib. i. c. 7.

† Boerhaave.

a loss of the power of voluntary motion, but affecting certain parts of the body only, and thus distinguished from apoplexy *; an incapacity of sense or of motion when the person is awake †; a corporeal torpitude, and muscular immobility more or less general, without somnolency. ‡

Perhaps the following definition may be considered as comprehending all the chief characteristics of palsy. It is a disease in which there is a diminution, or an entire loss, of the power of voluntary motion, or of sensation, or of both, in some particular part or parts of the body, without coma.

Palsy sometimes comes on suddenly, sometimes gradually, and is preceded by symptoms much resembling those formerly described as the forerunners of apoplexy; particularly vertigo, drowsiness, pain in a circumscribed part of the head, numbness or torpor, loss of memory, and faltering in speech. These I have often seen the precursors of palsy; and to them may be added a faltering inarticulate voice, drowsiness, forgetfulness, a slight delirium, a

* Cullen. † Young. ‡ Good.

dimness of sight, or double vision, trembling, a numbness gradually ascending to the head, frequent yawning, weakness, distortion of the mouth, and a disposition to faint. These signs in some cases precede palsy for a few hours, or for a few days. Sometimes a weakness of a limb, or of one half of the body, has for many months, or some years, been gradually increasing, and at length ended in a perfect hemiplegia. Sometimes notices of approaching palsy have come on, and then disappeared for some hours, as if there were a struggle between the constitution and the disease, till these threatenings have either wholly ceased, or have ended in a resolution of the nerves.* Palsy often begins by affecting a very small part of the body, as one arm, or the hand only, or sometimes one finger, the muscles of the tongue, of one side of the face, or of the eyelids.†

Palsy chiefly consists in the loss of the power of voluntary motion, for sensation in a greater or less degree generally remains;

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* Heberden. † Abercrombie.

nay, in certain cases it is morbidly increased. I have seen several instances in which paralytic persons have felt very violent pain in the parts affected, particularly in the shoulder and arm. These remarks might be confirmed by quotations from various authors. — I never saw a case of palsy in which sensation was entirely lost; and an eminent physician of great experience asserts, that a total loss of feeling in this disease is extremely rare. The senses are often but little injured; sometimes they remain wholly unimpaired, and several instances might be adduced in which they appeared to be preternaturally acute. Dr. Heberden attended a paralytic person, whose sense of smelling became so exquisite as to furnish perpetual occasions of disgust and uneasiness; and he mentions one case in which *all* the senses became exceedingly acute.

The vital and natural functions in palsy are generally but little affected. The actions of the heart and lungs are indeed sometimes more languid, and the secretions and excretions less regular than in a state of health; but this is not usually the case.

It is a very common opinion, that parts affected with palsy become colder than they are in a state of health. Mr. Henry Earle, who has paid particular attention to the subject, and who has made some ingenious experiments relative to it, is of this opinion. He thinks that a limb deprived of due nervous influence is of a much lower temperature than natural; that it is incapable of supporting any fixed temperature; that it is peculiarly liable to partake of the heat of surrounding media; and cannot, without injury, sustain a degree of warmth which would not be at all prejudicial to a healthy limb. In examining paralytic limbs, Mr. Earle invariably found them colder than any other part of the body, unless they had been kept artificially warm; and he mentions twenty-five cases in the Bath Hospital, in which paralytic limbs were found to be below the natural standard.*

Dr. Abercrombie, on the contrary, is inclined to believe that paralytic parts do not become colder than natural. In a communication with which that gentleman has

* Medico-Chirurgical Transactions, vol. vii.

favoured me on this subject, he mentions the well-known fact, "that living animals have a remarkable power of accommodating themselves to varieties of external temperature, and of preserving a nearly uniform temperature, though exposed to great degrees of heat and cold; while inanimate bodies, placed in the same circumstances, are much heated in the one case, and much cooled in the other." Now, this power of preserving a medium temperature, Dr. Abercrombie thinks, is partially lost by paralytic limbs; so that they are more heated, when exposed to heat, and more cooled, when exposed to cold, than parts which are in a healthy state. He had long ago observed, that paralytic limbs are sometimes warmer than sound limbs, but without being able to account for it. On attending to this principle, which appears to him to apply to it, it would be very easy, he says, to ascertain it by direct experiment. He mentions the following curious fact in illustration of his doctrine on this subject: —"A medical gentleman, on visiting a paralytic patient, was astonished to find the paralytic arm so intensely hot that he

could not touch it. He was at first very much surprised; but found, upon enquiry, that the patient had, by the advice of a friend, applied to the arm a quantity of very hot bran, or something of that kind very hot, which had been removed a short time before his visit." If Dr. Abercrombie's notion be correct, that paralytic limbs lose their power of preserving their temperature, or, in other words, if their power of resisting changes of temperature be lost, it appears to me, that the temperature of such parts would be less than that of other parts exposed to a medium of heat inferior to that of the human body, which is always the case in temperate climates.

Paralytic limbs often become more soft and flaccid than natural; they waste and shrink, and sometimes appear œdematous. Mr. C. Bell has observed, that in these cases the nerves themselves lose much of their substance. Where my attention in palsy has been called to these circumstances, I have thought that the parts affected were diminished in size, and colder than healthy parts.—The torpor and numbness of paralytic parts is sometimes accompanied with a disagreeable sensation,

as if from the creeping of small insects over them; hence called *formicatio.*

In palsy, the energies of the mind are often much weakened; sometimes they are entirely destroyed. After a paralytic stroke, the memory especially is frequently injured; and we have some curious cases on record of partial defects of that faculty, or of the complete loss of its power as to particular subjects. — Galen, speaking of the causes of the symptoms of affections of the governing energies, says, we have seen some persons who had entirely forgotten letters and arts, and even their own names.* He observes, that such symptoms manifestly show a refrigeration of the brain, as in apoplexy and epilepsy†; and though he does not use the term paralysis in this passage, I think it probable that he had also that disease in view; for he sometimes includes palsy under the head apo-

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* Ενίους γοῦν καὶ γράμματα καὶ τέχνας τελέως ἐπιλαθομένους ἐθεασάμεθα καὶ μηδὲ των σφέτερων ὀνομάτων μεμνημένους.

† Τὰ μὲν δὴ τοιαῦτα συμπτώματα τὸ σῶμα κατεψύχθραι δηλοῖ τᵾ ἐγκεφάλου ὥσπερ καὶ τὰ ἀποπληκτικὰ καὶ τὰ ἐπιληπτικὰ. *De Symp. Caus.* lib. ii. c. 6.

plexy. Dr. Baillie, in the fourth volume of the Medical Transactions of the College of Physicians, describes a curious case of impaired memory produced by palsy. It is that of a gentleman, aged fifty-six, who was seized with symptoms of compression of the brain, and became completely paralytic on the right side. By this attack, he lost his recollection of the words of his own language, except a very few; which he pronounced with the greatest distinctness, with a great variety of tone to express pleasure and displeasure, joy and sorrow, to explain the circumstances of his disorder, and to give directions about what he wanted, without being aware they were not the proper words to express his meaning. — The loss of the knowledge of language, as well as of the power of speech, is a very common consequence of a paralytic attack; and the recovery of it is generally gradual, and sometimes extremely slow. I have known several cases in which persons under these circumstances have not been able to recollect the words suited to express their thoughts, and have unconsciously employed others of a quite

different meaning. Instances might be adduced from authors, in which persons have lost all memory, even of their own language; which has not been, without great difficulty, and often very imperfectly, regained. Wepfer has given a curious case of this kind; and I have been informed from respectable authority, that a gentleman, after having received a partial injury in the head, by a fall from his horse, found that he had entirely lost the knowledge of a particular language, with which he had been well acquainted, although his memory, in other respects, remained uninjured.

I have lately had an opportunity of seeing a case of palsy, which in some of its symptoms a good deal resembled that described by Dr. Baillie. A gentleman, 46 years of age, who had always enjoyed a good state of health, after having experienced great uneasiness of mind, and after having been exposed to great bodily fatigue, was seized with apoplexy, followed by hemiplegia.

The fit was slight, but the subsequent hemiplegia was complete.

The power of speech was entirely lost, so that he could only utter the sounds ee-o; which, however, he so varied, that with the assistance of expressive gestures, he was able to convey his meaning very distinctly upon ordinary occasions.

He perfectly comprehended every thing that was said to him, and clearly understood what he meant to answer, but upon all occasions only uttered the sounds above mentioned; believing, however, that he actually employed the words suited to the communication of his ideas, and he often appeared surprised and displeased when he was not understood.

He sometimes endeavoured to explain his meaning by writing on a slate; but he generally substituted one word for another, and almost always erred in spelling what he wrote.

By certain means, which will be described in my account of the treatment of hemiplegia, he had gradually almost entirely recovered the power of speech; when he suffered another attack of apoplexy, which proved fatal.

The passions of the mind are sometimes greatly affected by palsy. Persons naturally mild and placid, have become peevish and irritable under its influence; and sometimes a change of an opposite nature has been caused by it. I had several years ago an opportunity of seeing an illustration of this remark, in the case of a much respected friend. The person to whom I allude had always, up to an advanced age, shown an irascible and irritable disposition; but after an attack of palsy, his temper became perfectly placid, and remained so until his death, about two years afterwards.

I have in several instances seen palsy terminating in childishness, or complete imbecility; and persons recovering from apoplexy appear, in many instances, to have undergone a most wonderful change as to the affections of the mind: we are informed that the wisest men and the bravest soldiers, persons of the strongest mental powers, have become so enervated as to weep like children on the slightest occasions.*

* Van Swieten, Comment. § 1018.

The duration of palsy is very different in different cases; sometimes a considerable degree of amendment is observable in a few days, but more frequently a favourable change is gradual and very slow. In cases of persons recovering from palsy, I have often observed, that the parts most distant from the head are first restored to sense and motion. In hemiplegia, it almost always happens that the power of the leg returns long before that of the arm; I have even seen more than one case, in which the arm of the affected side has remained paralytic for several years after the restoration of the leg. An eminent French physiologist has made similar observations; and remarks, that in the hemiplegias which supervene on apoplexy, the leg almost always also *loses* its motion first.

Palsy has been variously distinguished by nosologists according to its degree, its causes, and its seat. I propose to consider the disease according to its seat, and as it affects the body more or less generally; and with this view I adopt Dr. Cullen's division of the genus Paralysis, into the species *hemiplegia*, *paraplegia*, and *par-*

tialis. The first being a paralytic affection of the whole of one side extending from the head to the foot; the second, an affection of one half of the body transversely; and the third, that which is confined to some individual internal organ or external part. To these species, Dr. Cullen has indeed added another, the *venenata*, or that palsy which is produced by sedative powers. In this he has followed the system of Sauvages, who is very much in the habit of distinguishing diseases according to their causes, and who, in fact, with respect both to hemiplegia and paraplegia, has enumerated a prodigious variety of species, such as the *plethorica*, *serosa*, *traumatica*, and very many others; but I cannot help thinking that such a system of minute division and subdivision rather tends to confuse than illustrate the subject.

CHAP. II.

History of Hemiplegia.

THE disease* *hemiplegia*, or *semisideratio*, as some call it, has been described or adverted to by almost all the ancients; yet the word hemiplegia does not any where, I believe, occur in the writings of Hippocrates, Galen, or Aretæus. Paulus Ægineta seems to have been the first who thus designated this species of palsy. Apoplexy, he says, consists in a general abolition of the powers of sensation and motion, together with an injury of the governing energies: if the obstruction be in either side, the disease is named hemiplegia and paralysis; but if the injury be in one particular part, it has its name from the part affected.†

Hemiplegia in a great proportion of cases is preceded by an apoplectic fit, which is

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* ημι, dimidium, πλησσω percutio.

† Ἐι δὲ κατα θάτερον μορός ἡ ἔμφραξις γένηται ημιπληγΐα καὶ παράλυσις ὀνομάζεται, εἰ δὲ καθ' ἕν τι μόριον η τοιαύτη συςάιη βλάβη εκείνου τῦ μόριου τὸ πάθ@ λεχθήσεται.

Paulus Ægineta, lib. iii. c. 17.

sometimes so slight and transient as to have escaped general notice; but the attentive observer will almost always perceive certain symptoms indicative of the stroke, particularly distortion of the muscles of the mouth, drowsiness, forgetfulness, and dulness of apprehension in a greater or less degree. As hemiplegia is so commonly the consequence of apoplexy, the precursors of apoplexy formerly mentioned must be considered as precursors of this species of palsy. Sometimes palsy appears immediately to succeed to these symptoms without the intervention of apoplexy, but I believe this very rarely happens. Sometimes hemiplegia comes on gradually; and in such cases, a French physician of eminence *, who has paid great attention to all circumstances connected with the disease, says that the face, just before the attack, becomes discoloured, the cervical and facial veins swell, the action of the tongue becomes impeded, the senses of sight and hearing become indistinct, the patient loses all sensation and knowledge of his actual state, and if standing, he falls

* M. Serres.

down on the side which is to become paralytic. The same diligent observer remarks, that on the accession of the disease, sometimes sooner, sometimes later, the thorax and lungs are unequally dilated, one side of the chest being as if motionless, whilst the other side is in a state of redoubled activity; and hence we may prognosticate which side is about to become paralytic. He has seen a distortion of the mouth preceding, for several hours, convulsive motions on the side afterwards to be affected.

Aretæus, who, without using the term hemiplegia, has well described the disease, was of opinion, that, in it, internal organs as well as external muscles are paralyzed; and some modern physiologists observe that the stomach and bowels are sometimes so affected, that they are insensible to the action of the strongest emetic and purgative medicines.* Hoffman, speaking of a palsy of

* It would appear, however, from the experiments of Magendie, and the observations of other physicians, who have found inflammation of the intestinal tube produced by ordinary purgatives under these circumstances, that the stomach and bowels are, in fact, particularly irritable; — vomiting and purging not taking place, from such medicines, merely because the action of the muscles necessary for those functions, cannot be excited.

the right side, remarks that the viscera of that side, particularly the liver, the stomach, and the intestines, which borrow so many branches from the external nerves, become affected; a circumstance not sufficiently attended to, he says, by physicians. He adds, I have often seen in the dissection of persons who died paralytic, a very great enlargement of the liver. * Morgagni mentions the case of an old man who was affected with palsy in the right side, and at the same time with jaundice, the jaundice being confined to the paralytic side so accurately, that even the right part of the nose was yellow, whilst the left retained its natural colour. †

The palsy which follows apoplexy is generally a complete hemiplegia; but this is not always the case. We find in authors a very great variety of hemiplegiac anomalies, if I may so call them; and I think that I cannot better illustrate the history and the nature of this disease, than by giving an account of those cases which appear the most varied and the most extraordinary in their

* Hoffm. Consil. et Resp. Cent. 1. § 1. p. 23.

† Morgagni, Epis. xi. art. 14.

symptoms. — Sauvages, from Conrad Fabricius, speaks of an hemiplegia which he calls *transverse*, in which one arm and the foot on the opposite side were paralytic. This species of hemiplegia, he says, frequently is the consequence of a malignant epidemic dysentery, prematurely suppressed by astringents and opiates. He adds, the rationale of this is obscure.* — Ramazzini speaks of a person in whom one leg had lost its feeling, but not its power of motion, and the other its motion, but not its feeling. †

Senac mentions a case of a paralytic person in whom the most acute sensation was experienced, without the power of moving, in one arm; whilst, in the other, sensation was lost, though motion remained perfect. Burserius quotes a similar case from Heister. Sauvages enumerates, among the species of hemiplegia, one which he denominates *intermittens*. It is that hemiplegia, he observes, which comes on every

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* Hujus phenomeni ratio latet in obscuro. *Sauvages*, vol. i. p. 793.

† Ramazzini, De Morb. Artif. 286. E.

day, and, after some hours, recedes with an accession of quotidian fever; and he gives a minute description of a case of this kind.* Morgagni describes an hemiplegia in a female of about forty years of age, which came on after a long-continued and obstinate pain of the head, and gradually increased, till the patient at length had no use of the side, either for sensation or motion. While she was thus affected, she was seized also with the same kind of palsy on the healthy side, every day, towards the evening, which went entirely off as the morning came on. After this disorder had attacked her seven or eight times at the same hour, or at least not more than one hour sooner or later, she died of inflammation of the thorax. The body of this person was not examined after death.

Dr. Abercrombie speaks of instances of loss of feeling without loss of motion: several, he says, 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

* Sauvages, vol. i. p. 795.

his duties, who had so completely lost the feeling of his right leg and arm, that he allowed the parts to be cut, or red-hot iron to be applied to them, without complaining of any pain. In a case related in the Ephem. Nat. Curios., there was loss of motion on the one side, and loss of feeling on the other.—Dr. Falconer mentions the case of 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 warmth of his feet, they appeared to him to cool.*

M. Serres speaks of a double hemiplegia, which he describes as a disease in which the whole muscular system, except what relates to deglutition, is deprived of motion. In whatever degree the patient is stimulated, whether by blisters, or sinapisms applied to the limbs, or even by the application of the actual cautery, no contraction can be produced; the muscles appear to be passive, remain without motion, either relaxed, or

* Dr. Abercrombie, p. 58.

in a forced and permanent state of contraction. On dissection, in a case of this kind, two recent cavities were observed in the brain, one in the central part of the left lobe, close to the thalamus opticus and the corpus striatum; the other in the right lobe, in the bottom of the corpus striatum, having extended to the corresponding ventricle.

There are two cases of anomalous palsy, referable to the head Hemiplegia, related in the seventh volume of the Transactions of the Medico-Chirurgical Society, both of which were attended with several very curious and extraordinary symptoms and circumstances; I shall, therefore, here briefly notice them. The first is the case of the celebrated De Saussure; the other, that of Dr. Vieusseux, of Geneva.

" M. de Saussure, after having been, for a considerable time, harassed by painful political exertions and domestic anxiety, was suddenly attacked with vertigo, followed by numbness in the left arm and leg. The arm executed with facility every kind of movement, but conveyed no distinct sensation of touch. M. de S. felt always as if

a quantity of sand were interposed between his fingers and the objects to which he applied them. This sensation was even to a certain degree painful and agonizing, as if the chief morbid affection of the hand had consisted in an excess of sensibility; so that he was afraid to use it without the protection of a glove. A sensation somewhat analogous to this was also felt in the cheek and mouth of the same side; which, when he passed his hand across his face, made him sensible of a line of demarcation, very distinctly defined between the right and left side, a sensation which was extremely disagreeable. In other respects, he enjoyed good health, and showed no symptoms of plethora, or of debility. He also retained for a long time his wonted presence of mind, and the full vigour of his intellectual faculties. Many months elapsed without the least change, although this interval was occupied with trials of a multitude of remedies.* "

" The disorder grew worse, but almost always by sudden accessions more or less dis-

* Med.-Chir. Trans. vol. vii. p. 214.

tinct and severe. One of the most violent of these seizures occurred at the baths of Bourbon, and was brought on by a *douche* that had been made too hot; and so complete was the attack, that the whole of the left side, from the foot to the tongue, was affected by it. His speech became gradually confused, and almost unintelligible. His legs, especially the left one, were raised or bent with difficulty. This was most perceptible when he attempted to walk in a straight line, following the junctions in the floor of his apartment; a kind of exercise in which, from constant practice, he had become very expert, having pursued it with a view of accustoming himself to tread with security on the narrowest ledges of mountains, and borders of precipices. But his disorder had now deprived him of the power of preserving his balance, and his limbs were no longer obedient to the determinations of his will. The most remarkable circumstance, however, attending this state was, that after he had become so infirm as to require the assistance of a stick in walking, it was in going in or out at the door of a room that he experienced

the greatest difficulty. He could cross the room with a tolerably firm step; but the moment he reached the door, although open on both sides, and leaving a space much wider than his body, and without any difference of level in the floor, it was a most arduous undertaking for him to pass through. He tottered, and precipitated his motions, as if he were preparing for the most perilous leap; no sooner was the difficulty surmounted, than he recovered his former confidence, and proceeded with ease across the passage, until he came to another door, when the same unaccountable terrors again assailed him, and the same caution and trouble were requisite to achieve the steps by which the invisible barrier was to be passed."

The case of Dr. Vieusseux is not less extraordinary than that which I have just related. — " Dr. Vieusseux, after having felt a slight pain in the gum, and an extremely acute pain in the internal angle of the left eye, experienced a peculiar and inexpressible perturbation in all his sensations; a giddiness, which made him see objects reversed, and occasioned feelings similar

to those produced by a ship violently agitated, such as sickness and vomiting. These were followed by intestinal evacuations, and by a complete loss of his voice, which rendered his speech almost unintelligible, though without affecting his power of articulation. He also experienced a considerable difficulty in swallowing liquids, when in small quantities, and a sensation of weakness throughout the left side, with a numbness in the hand and the leg. He was able to walk, however, supported by two persons, but dragging his left leg; and the motion of the fingers, though benumbed, continued free. His intellectual faculties, however, remained quite unimpaired, so that he could accurately observe the whole succession of symptoms. On examining himself, he discovered that the whole of his right side was so insensible, that he could be scratched or pricked without experiencing any pain; and that this insensibility abruptly terminated at a line dividing the whole body in a vertical direction." *

* Medico-Chir. Trans vol. ii. p. 216, 217.

About three months after the first attack, the following extraordinary symptoms supervened: — "The *left* half of the head was insensible either to pricking or scratching; this insensibility prevailed over the left half of the forehead, of the nose, of the upper and under lip, of the chin, and over the left ear. The eye on this side was partly shut, and the corner of the mouth slightly drawn downwards; the tongue, when put out, was turned rather to the left than the right side, but to a very trifling extent. The hand and fingers had a sensation of numbness, as after having struck a violent blow on a hard body, particularly the thumb, and the first and middle fingers. In the whole of this side there was a sensation of weakness; the leg dragged a little in walking, but it had not the feeling of numbness of the hand; and, indeed, except the peculiar affection of the face just described, the whole of the left side of the body preserved its usual degree of sensibility. — The *right* side of the head possessed the same sensibility as before the attack. It had experienced at first a very slight degree of insensibility, but in

the course of three or four days had returned to its natural state. With respect to the other parts of the body, if a line of division were drawn in a vertical direction from the lower part of the neck or upper part of the sternum, descending forwards all the way between the lower extremities, and rising backwards up to the nape of the neck, every part of the body on the *right* side of that line was insensible either to scratching or pricking, and even to the pain that inflammation usually produces. The sensations of heat and cold were, in the right side, totally different from what they naturally are. When the patient put his right arm out of bed, the air of the room felt extremely hot. One day, when he was getting better, an attendant brought him an etherized julep, which he took with his right hand, and the bottle felt lukewarm; but on taking hold of it with the left hand, he found it cold, as it really was. A new-laid egg having been brought to him for his dinner, on taking it with the right hand, he did not find it hot, but with the left, he felt as if it actually burnt him. He then distinctly perceived, that, to the right side,

cold bodies appeared hot, and hot bodies appeared cold, or only lukewarm. This is to be understood of liquids, and of polished bodies, as glass, stones, and metals, or even wood with a polished surface. Thus, on putting his right hand into cold water, it seemed lukewarm; and on putting it into boiling water, it appeared so far from hot, that he would have kept it immersed without being sensible of its scalding him, had not a disagreeable sensation, different from that of burning, at length warned him to withdraw it. But when he touched bodies that were not hard or polished, as the hand of another person, he could not judge of its degree of warmth; it appeared neither hot nor cold, and he was obliged to touch it with the left hand, in order to ascertain its temperature. This depraved sensation extended all over the right side; and consequently, on putting him into a cold bed, it appeared hot to the right side and cold to the left. In getting into a hot bath, it felt hot to the left side, and neither hot nor cold to the right; and in plunging into very cold water, which he did at a subsequent period, the water appeared almost

warm to his right side, but very cold to the other. He had often a sensation of cold water all over his face, especially when in the open air, which induced him to wipe himself as if he had been wet."

For a minute description of these two cases, together with the treatment of them, and a great variety of other interesting particulars, I refer to the Transactions of the Medico-Chirurgical Society.

I have lately had an opportunity of seeing a case of anomalous hemiplegia attended by circumstances not less extraordinary than those above described. An officer of high rank in the army, who is now about sixty years of age, was, in the year 1795, affected with a diminution of power in the right hand. This complaint increased, notwithstanding a variety of modes of treatment, till the year 1800; when, after a course of mercury, recommended by Mr. Cline, its further progress was stopped, since which time the disease has remained stationary. The peculiar circumstances of this case are the following. The muscles of the left arm, from the shoulder to the elbow, are much wasted,

and greatly diminished in power; while the muscles of the fore-arm are not at all lessened in size, and but little in power. The state of the right side is just the reverse, the muscles of the upper arm being of their natural size, and possessing their full power; whilst those of the fore-arm are very much wasted, and their motion, especially that of the fingers, is almost entirely abolished. In all other respects, this gentleman appears to be perfectly well. No cause for this disease can be assigned, nor did any method of treatment afford the smallest relief, till the mercurial course was adopted, when the progress of the disorder was arrested in the year above-mentioned. Since that time no attempts to remove the complaint have been made, yet it does not increase.

In a late publication by Mons. Keratry, a case of general palsy is related, the circumstances of which are so very extraordinary, that I have some doubt of the accuracy of his narration. This case is adduced with a view of showing how little residue of animal existence is sufficient for the preservation of the intelligent

being. There is now living, he says, in D'Isle et Vilaine, a person, who, after having been blind for ten years, lost also the sense of hearing, and, in a little time afterwards, became almost universally paralytic. He was entirely deprived of the use of his arms, legs, thighs, and of the whole exterior surface of the body, with the exception of a part of the face; but the power of speech, and the functions of respiration, circulation, and digestion remained. Under these deplorable circumstances, however, he is not, says Mons. Keratry, wholly without consolation, for a sort of intercourse is preserved with his family and friends, by means of characters traced on that part which still retains its sensibility, and in this state of unexampled misery, he retains, in some degree, the distinguishing character of man — intelligence.*

Among the anomalies of hemiplegia, we may likewise reckon those in which that disease is found combined with, or alternating with, convulsions, several of

* Inductions Morales et Physiologiques, p. 375.

which have been described by Morgagni and others.

In addition to these, many cases of this species of palsy, attended by uncommon symptoms, might be adduced from authors, particularly from Dr. Abercrombie's excellent treatises on Apoplexy and Palsy.

Hemiplegia sometimes terminates in a few days, but much more frequently the progress towards recovery is very slow. It often happens that an amendment to a considerable degree takes place, and then the disease remains stationary for months, or even for years: thus we frequently see persons, who have been attacked by Hemiplegia, so far recovered as to be able to walk in an imperfect manner, one leg being dragged, with the foot turned out, without making any material further progress towards the healthy state. — In some cases, Dr. Abercrombie remarks, the patient makes no improvement at all, is confined to bed in the most helpless state for several weeks, and then dies, gradually exhausted, sometimes comatose for a day or two before death. — Celsus has forcibly described the sad condition of a protracted palsy. He

says, those who labour under universal palsy are generally soon taken off; if not, they live, indeed, longer, but very seldom are restored to health; for the most part they are deprived of their memory, and drag on a miserable existence.* The most distressing state of this disorder, says Dr. Heberden, is that in which the powers of body and mind are in the highest degree debilitated, and the passions becoming ungovernable, lead almost to madness, so that a person survives himself, as it were, and is reduced to a state of the utmost misery, if conscious of it; being unable to stand, to speak, to feed himself, or to retain the fæces or urine, yet continuing thus to live a burthen to himself and all his friends.

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* Solent autem qui per omnia membra vehementer resoluti sunt, celeriter rapi; si correpti non sunt, diutius quidem vivunt, sed raro ad sanitatem superveniunt, et plerumque miserum spiritum trahunt, memoria quoque amissa. *Celsus*, lib. iii. c. 27.

CHAP. III.

History of Paraplegia.

PARAPLEGIA, which, in importance, ranks next to hemiplegia, is that species of palsy in which the lower half of the body, on both sides, is deprived of sensation, or of motion, or of both. The word *paraplegia* frequently occurs in the writings of the ancients, and was employed by different physicians among them in various senses, but by none in its modern acceptation. Hippocrates denominates all those paralytic affections paraplegiæ, which occur in consequence of apoplexy. Aretæus says, that disease which Hippocrates calls vehement apoplexy, when it affects the whole body, is denominated by him paraplegia, when it affects the leg. Aretæus himself uses the word to denote a remission of sensation and motion in some one particular part.* Boer-

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* Παραπληγίη δὲ παρεσις μὲν αφης και κινησιϴ, ἀλλὰ μερεος ἡ χειρος, ἢ σκέλεϴ.

Aretæus, de Morbis Diut. lib. i. c. 7.

haave, in his Aphorisms, says, paraplegia is a palsy of all parts below the neck*; but in his lectures on the diseases of the nerves, he calls it a resolution of all the voluntary muscles below the neck, which, however, he observes, is never perfect; for, if it were, death would ensue. It is the custom at present, in the medical schools, Van Swieten observes, to call that disease paraplegia, in which voluntary motion ceases in all parts below the neck.

Although Boerhaave and Van Swieten have thus defined paraplegia, I wish to remark, that, in this species of palsy, the superior parts of the body are seldom affected, unless the disease depends on causes seated in the upper parts of the spine. In proportion as the exciting cause in the spine affects the higher parts of the medulla spinalis, the higher parts of the body become paralyzed. Galen was aware of this fact, and has pointed out to his disciciples the practical use to be made of the

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* Omnium cervici suppositarum partium.
Boer. Aphor. 1810.

knowledge of it. If the spinal marrow, he says, be affected about the fifth vertebra, the hands will be wholly deprived of sense and motion; if about the sixth, the paralytic affection of them will be more partial, &c.; and if below the eighth, they will not be affected at all.*

The loss of sensation and motion in paraplegia is chiefly observable in the pelvis, and the lower extremities; the upper limbs, the organs of respiration, and the action of the heart and arteries, as well as the functions of other important viscera, remaining unimpaired. Indeed, Boerhaave notices this fact, and observes, in explanation of it, that the moving powers of the viscera can scarcely be said to arise from the nerves of the spinal marrow, but from the fifth, sixth, and eighth pair, and the recurrent nerves of Galen. If all the muscles below the head were to become paralytic, respiration, he says, and the motions of the viscera, could not go on; yet these motions

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* Εἰ δὲ ὁ μετ᾽ αὐτὸν (σπόνδυλον ὄγδοον) οὐδὲ ὅλως ἔτι πάσχουσιν αἱ χεῖρες οὐδέν. *De Sympt. Caus.* lib. i. c. 5.

continue, and in apoplexy are even increased. M. Le Gallois, as has been already observed, places the source of the power of respiration in a part of the medulla oblongata, near the occipital opening, towards the origin of the eighth pair of nerves.

Paraplegia, as will hereafter be particularly described, arises from various causes, sometimes seated in the head, sometimes in the spine or its neighbouring parts; and the symptoms of the disease vary according to the cause. In some cases of paraplegia, no sufficient cause can be assigned. The paraplegia depending upon a diseased state of the spine, and its connections, is by far the most frequent. This affection may be produced by mechanical injuries, as by falls and blows; but, in a great proportion of instances, especially in infants and young children, it takes place gradually, depending on a constitutional affection. This disorder generally comes on slowly, and is preceded by languor, listlessness, and weakness in the knees. As it advances, a difficulty in properly directing the feet is experienced, and an in-

voluntary crossing of the legs, with frequent tripping or stumbling are observable, and the legs or thighs are found to have lost a good deal of their sensibility, and to have become useless for the purposes of motion. When an adult is the patient, the progress of the distemper is much the same, but rather quicker. *

Mr. Pott is not disposed to consider this as a paralytic affection, and points out some circumstances by which it differs from what he calls the nervous palsy. I think, however, that it may be properly placed under the head paraplegia, as it consists in a loss of motion and of sensation in a greater or less degree, in the lower extremities; for, whatever may be the number of vertebræ concerned, or whatever may be the degree or extent of the curvature, the lower limbs only feel the effects of it.

In this disease, the general health does not seem at first to be materially, if at all, affected; but when it has existed some time, and the curvature has increased, many incon-

* Pott. Copeland.

veniences and complaints come on, such as difficulty in respiration, indigestion, pain and a sense of tightness at the stomach, obstinate constipations, purgings, involuntary flux of urine and fæces, &c. with the addition of what are called nervous complaints, some of which are caused by the alteration made in the form of the cavity of the thorax; others by impressions made on the abdominal viscera. * It seems not improbable, that Galen was acquainted with this disease so well described by Mr. Pott. In the sixth chapter of the fourth book *De Locis Affectis*, he speaks very much at length concerning various derangements of the spine and their effects, and of the diseases of the spinal marrow itself; and he adds, you ought to know, that the vertebræ may be removed from their proper situation either by a fall or a blow, or *some preternatural tumour drawing or deranging the parts connected with the vertebræ themselves* (ligaments) *and the nervous body of the spinal marrow.* †

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* Pott.

† χρὴ γὰρ ὑμᾶς ἐπίσασθαι τοὺς σπονδύλους ἐξίστασθαι.

The paraplegia depending upon an affection of the brain has been pointed out by Dr. Abercrombie, and particularly described by Dr. Baillie, in the Transactions of the College. This loss of sensation and motion in the lower limbs, Dr. Baillie thinks, more especially occurs at the middle or a more advanced age, and more frequently in men than in women. It is accompanied either by some feeling of pain, or giddiness, or sense of weight in the head, or undue drowsiness, and vision is often more or less impaired; sometimes the sight of one eye is almost entirely lost, and its pupil appears dilated, as in gutta serena, and occasionally there is a paralytic dropping of the upper eyelid of one eye; sometimes the affection of the brain is marked by a defect in the memory, and a want of the ready exercise of the general powers of the mind; sometimes one or both of the upper extremities are affected more or less with numbness, and with a feebleness in their motions,

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ποτε τῆς οἰκείας θάσεος, ἤτοι γ' ἐκ πτώσεως, ἢ πληγῆς, ἢ τινος ὄγκου παρὰ φύσιν, ἐπισπωμένου τὰ συμφῦη τοῖς σπονδύλοις αὐτοῖς καὶ τω νωτιάιω νευρώδη σώματα·

when no disease whatever can be found in the cervical part of the spine. These circumstances, Dr. Baillie thinks, afford strong evidence that the cause of the disease exists in such cases, within the cavity of the skull; and that it consists in some mode of pressure on the brain. For a more particular account of paraplegia, from this cause, I refer to the sixth volume of the Transactions of the College.

I have sometimes seen cases in which a paralytic affection of the arms has been occasioned by some complaint in the head; but I do not recollect to have seen, in an adult, a loss of power of the lower extremities from that cause, marked by the train of symptoms described by Dr. Baillie, of whose accuracy of observation, however, I have not the smallest doubt. *

Paraplegia by no means exhibits such varieties of symptoms as occur in hemi-

* Since the former publication of my account of palsy, Dr. Baillie has shown me his notes of several cases of paraplegia, the symptoms of which were very strongly in proof that the cause of the disease was seated in some part or parts within the cranium.

plegia. Some anomalies of this species of palsy have been described by authors; but I have not found any which appear to be particularly interesting. — In illustration of this part of our subject, I shall only introduce the following case of anomalous paraplegia, which Dr. Hutchinson has been kind enough to communicate to me.

Major H. in the 45th year of his age, experienced a paralytic affection of the lower limbs, rendering him unable to direct their movements, coming on in paroxysms, after the exercise of walking for two or three miles. On these attacks he was always under the necessity of catching hold of something by which he might support himself by his arms, or of quickening his pace to that of running, when, after a short time, if not supported, he fell to the ground. After such exertions, he always complained that his limbs were so heavy that he was unable to raise them, but he experienced no head-ache or giddiness, or disorder of the senses.

For two or three years previous to the first occurrence of this disorder, he had complained that his state of health was

deteriorated, although no precise symptoms of disease could be pointed out either by himself or his medical friends. His appetite was good, his bowels regular, though inclined to costiveness, and his usual robust appearance was not diminished. He entertained some fanciful notions respecting the state of his health; and, from some uneasy sensations about the sacrum, he supposed that he had internal hæmorrhoids, though no evidence of their existence could be perceived by his physicians, by whom he was considered as hypochondriacal. After having suffered the attacks above described, very often, for two or three years, he gradually lost the power of walking without some support for one of his hands, though the shoulder of a boy of ten years old was sufficient for him to lean on. He still complained of the extreme heaviness of his limbs, which he could not raise from the ground without assistance. In this state he continued for four years: he then went to Bath, and had the hot water pumped upon his loins. Soon after this he complained of pain in the loins, which was followed by a collection of fluid behind the great

trochanter of the left thigh, which burst externally, and was discharged daily in considerable quantity. The paraplegia was now complete, the lower extremities being quite useless; the fæces and urine, which, for a considerable time past he had with some difficulty retained, came away involuntarily; his strength rapidly wasted; he became much emaciated; and, at the end of three months after his return from Bath, he died; retaining the use of his senses and his intellectual faculties to almost the last instant of his life.

Major H. had for many years been exposed to the hardships of a military life, particularly to the extremes of heat and cold in various climates, which probably laid the foundation for his disease; but the immediately-exciting cause of it was not ascertained, the body not having been examined after death. From the uneasy sensations he felt about the sacrum and loins, and the subsequent purulent discharge, it seems probable that the lower part of the spine was diseased; though no external signs of such disorder had been evident before the formation of the abscess

and the local tenderness about the loins by which it was preceded, after the use of the pump-bath.

The termination of paraplegia, whether favourable or unfavourable, is generally slow, and it is sometimes protracted to a very great length of time.

CHAP. IV.

History of Paralysis Partialis.

Paralysis partialis is that species of palsy which affects less than half the body, or some one particular part or organ. In the definition of the genus palsy, we include diseases which consist in a loss of sensation; we therefore place among the partial palsies, not only those local nervous affections in which there is a diminution or loss of motion, but also certain others, in which there is a want of sensation only. The partial palsies may be considered as they consist in a want of sensation, or of motion. Under the first head may be placed paralytic affections of the olfactory nerves; of the retina; of the gustatory nerves; of the auditory nerves, and of the nerves of touch; and under the second, the want of motion of the eyelids;

of the muscles of deglutition ; of the organs of speech ; of the bladder ; and the want of motion in particular parts from the effects of lead. *

Aretæus considers palsy chiefly as a defect of motion or action. Where there is a defect of sensation only, as sometimes, though rarely, happens, he says, it should rather be called *anaisthesia* † than *paresis ;* and Sauvages and Cullen have placed several of the paralytic affections, which consist in the loss of sensation, under the order, *dysaisthesiæ.* ‡

Paralytic affections of the organs of sense are designated by appropriate terms. Thus, want of sensation in the retina is called *amaurosis,* or *gutta serena ;* of the olfactory nerve, *anosmia ;* of the gustatory nerves, *ageustia ;* of the auditory nerves, *dysecœa,* or *cophosis ;* and of the nerves of touch, *anaesthesia.*

The organs of the vital and natural functions may also be affected by palsy, as well as the organs of sense. Thus we

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* Young. † ἀναισθησία. ‡ δυς αἴσθησια.

read of paralytic affections of the head; of the organs of respiration; of the œsophagus; of the stomach and intestines, and of the viscera of the pelvis; but, excepting the affection of the latter, as has been before observed when speaking of paraplegia, such palsies very seldom occur; a circumstance we may understand, if we consider the sources from which they derive nervous influence, and the inherent powers which some of them possess. The functions of these organs are very important, and they are guarded in an especial manner from the attacks of this disease.

Particular muscles are often, from various causes, as will hereafter be explained, affected with palsy. Sometimes, says Galen, the whole leg becomes paralytic, sometimes the foot only, and the same may be said of the head. Dr. Abercrombie speaks of cases, in which the paralysis is confined to one muscle, or one set of muscles, and remains in that state for a long time without improvement, and without going further.

In a letter with which he has favoured

me respecting various paralytic affections, he states that, " he has lately seen a man, whose mouth is so twisted to one side, that the left angle of it is nearly on a line with the septum of the nose: he has no other paralytic symptom. Several years ago he went to bed one evening with violent head-ache, and awoke next morning with his mouth in this state. It has continued so without the least improvement, and without any return of affection of the head."

Persons much engaged in practice, see innumerable degrees of paralytic affections from the torpor and weakness of a single joint of a finger, to a complete apoplexy, in which sense and motion perish through the whole body. Sometimes the muscles of the lower lip have become paralytic, while the rest of the body has been free from the complaint, sometimes the eyelids are thus affected. Much more frequently the disease attacks the organs of speech, so that the voice becomes stammering and inarticulate, or wholly abolished. The nerves of one side of the face are also very frequently paralysed, in which case the affected corner of the mouth

becomes lower than that of the sound side; so that mastication is performed with difficulty, the food adhering to the paralysed cheek, and both solids and fluids frequently escaping from the mouth. * Paralysis, sometimes, affect the muscles of deglutition only, or of the tongue; sometimes one arm, or hand, or one finger. The muscles of the legs and thighs are often the seats of this disease, as also the spincters of the anus and bladder, so that the urine and fæces cannot be retained.

The corners of the mouth and the tongue are very frequently affected in palsy, more especially in hemiplegia. There is almost always a twisting of the mouth with impeded speech. Indeed I never saw a case of that species of palsy, in which these symptoms were not in a greater or less degree present. Dr. Abercrombie is of opinion, that the inability to speak does not always depend upon a paralytic affection of the tongue. In the loss of speech, which accompanies many paralytic affections, he

* Heberden.

thinks there is something singular, as it is quite distinct from mere palsy of the tongue. "A man whom I attended in an ordinary attack of hemiplegia, eighteen months ago," says Dr. A. "recovered the use of his limbs after a short time, so that, his intellect being quite correct, he was able to follow his employment, which is that of a collector of taxes. He has never recovered his speech, however, in the smallest degree, although he has every motion of the tongue perfectly, and of the lips; every motion, in short, that is required for framing letters; and he can make a sound, showing that the functions of the larynx are unimpaired, but he never attempts any thing like an *articulate* sound. His understanding also is entire, and he has not lost his knowledge of written language, as appears from his management of his business." What is it, then, says Dr. Abercrombie, that he has lost?

Innumerable similar accounts of partial palsies might be quoted from various journals, and other medical publications; these, perhaps, will be considered sufficient for our present purpose.

A very common partial palsy, is that which arises from lead, and other metallic substances. Dr. Cullen considers this as a distinct species of palsy, which he denominates *venenata;* but I think it may with propriety be included under the head Paralysis partialis.

After this account of the various kinds of palsy, I shall briefly notice a question which has a good deal engaged the attention of physiologists, both ancient and modern.

It is universally admitted, that, in palsy, sensation often remains when motion is lost; and sometimes, though very seldom, we observe that motion remains when sensation is lost.* But how does it happen that these powers are not always both lost, if either of them be lost, since they both depend upon the nerves? This seems at all times to have been considered as a difficult question. Galen has taken some pains in endeavouring to explain it.

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* A very curious case of this kind, under the title Anaisthesia, is described by Dr. Yelolly in vol. iii. of the Medical and Chirurgical Transactions, page 90.

After Galen's cure, formerly mentioned, of a palsy of the fingers, by applications made to the spine, he says, a question arose among the physicians, what is that state of the nerves in which it happens that their motion remains, their sensation being lost? Galen told them that motion is active, but sensation is passive; and therefore a greater nervous power is necessary for the former than for the latter. There may then be nervous power sufficient for sensation, though not sufficient for motion; so that sensation may remain though motion be * lost. With respect to those cases in which motion remains, sensation being lost, he observes, in explanation, that motion is performed by nerves through the medium of muscles; but that sensation depends upon nerves distributed to the skin. Now, the nerves of the skin may be injured, whilst those of the muscles remain uninjured, and

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* Ἡ μὲν αἴσθησις ἐν τῳ πάσχειν, ἡ δὲ κίνησις ἐν τῳ ποιειν τι γίνοιτο. καὶ διὰ τοῦτο ῥώμης μεν δεῖ τω κινήσοντι, τῳ δ' αἴσθησομένῳ καὶ ἡ βραχυτάτη δύναμις ἀρκεῖ·

De Loc. Affect. lib. i. c. 6.

thus motion may remain though sensation be lost. He proceeds, in illustration, to say all voluntary motion is performed by muscles, the nerves alone not being capable of exciting such energy in the parts of an animal. Sometimes, he observes, the muscles themselves reach the part to be moved, sometimes they act by means of tendons, which by some are called aponeuroses: of this kind are the tendons which move the fingers, similar to those which Hippocrates calls round tendons. Now, if it happen that the nerves of the muscles are affected, the fingers lose their *motion;* if those distributed to the skin only suffer, the sense of *feeling* only is lost. When the limbs are all paralyzed, the common principle being affected, both sensation and motion are destroyed together.* It may be observed that this last explanation of Galen might have been applied to both points of the question. In another part of his works, Galen speaks as if he inclined to the opinion of Erasistratus and Herophilus, who

* Galen, De Locis Affect. lib. i. cap. 6.

taught that nerves are of two kinds, one for sensation, and the other for motion. With respect to the tongue and eyes, he says, there can be no doubt that the nerves are of two kinds. *

Forestus, on this subject, adopts the opinions and explanations of Galen. Haller also seems disposed to admit this doctrine. In endeavouring to explain the phenomena in question, he supposes that motion requires more power than sensation, and therefore first perishes. When a paralytic limb is void of sensation, he thinks the mischief must be very great, as but a small degree of power is required for the sense of feeling. In those cases in which the limbs are insensible, yet retain the power of motion, he supposes the fault to be in the epidermis, or the skin. † Sauvages also thinks that greater nervous power is required for motion than for sensation, and

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* Κατὰ μὲν δὴ τὴν γλωτταν καὶ τοὺς ὀφθαλμοὺς ὀυδεν απορον, ἐπειδαν διττὰ νεὺρων γενου τούτοις ἐςὶ.

De Sympt. Caus. lib. i. c. 5.

† Haller, Elem. Phys. vol. iv. lib. x. § 22.

refers to the demonstrations of Borelli in confirmation of his opinion. *

Van Swieten adopts the notion of Erasistratus. He says, we know from physiologists, that some nerves serve for sense, others for motion, which, although distinct in their origin within the encephalon, yet, being collected in the greater trunks of nerves, are carried together to the different parts of the body, the functions therefore of the nerves for motion may be impeded, while those for feeling remain either wholly unimpaired, or injured in a small degree only, and the contrary.

I do not find, in the writings of the physiologists of the present day, any investigation of this question; but Dr. Wilson Philip, in compliance with my request, has given me his opinion upon it. Dr. Philip, who has carefully studied the nervous system, says, "I think we must admit that the bundles of nerves, going directly from the brain or spinal marrow to any part of the

* Sauvages, vol. i. p. 789.

body, contain nerves of two descriptions, one set adapted to convey the dictates of the will, the other to convey impressions from the part to the sensorium. This I think more probable than that impressions move backwards and forwards in actually the same channels: one of these opinions must be correct. If the former is so, there is no difficulty in accounting for the feeling being lost, and the power of motion remaining, and *vice versâ*. Indeed these phenomena of disease seem to me to go some way towards proving the former opinion. These observations may perhaps be applied to all nerves, but in other respects the ganglion nerves seem to obey laws very different from those which come directly from the brain and spinal marrow."

Mr. Charles Bell, whose physiological opinions deserve great attention, has also, in compliance with my desire, favoured me with his sentiments on this question. The nerves of sensation and motion, he says, "are bound together in the same membranes, for the convenience of distribution, but there is reason to conclude that they are distinct through their whole course, and

as distinct in their origin in the brain, as in their final distribution to the skin and muscles; why then should we suppose that they are similarly affected in diseases of the brain? Even nerves of the same class, viz. the nerves of voluntary motion, are not affected in the same degree by disorder of the brain. When there is effusion upon the membranes of the brain, from excessive inebriety, or dropsical effusion of any kind, the muscles are influenced unequally, and it is remarkable that those muscles, and consequently those nerves, which are immediately under the influence of the will, are first affected or debilitated in the greatest degree, where there is a general disturbance of the brain. The slighter disorders affect the muscles of the eyes; in a greater degree, we shall see palsy of the face; in a still greater degree, we find the muscles of the limbs unequal to their office. The muscles of respiration are next affected; and the fibres of the hollow viscera retain their office whilst there is life. If nerves of voluntary motion are thus differently affected according to the distinction of their functions, we need not be surprised that nerves,

in all respects so distinct as those of motion and sensation, should be differently affected by what appears to us a general and uniform affection of the brain. Besides, if it be as I have stated, that the nerves are different in their origins, though combined in their course, for example, that the ulnar nerve of the arm, being a nerve of the muscles, and also of the skin, has two roots, one connected with that part of the brain which receives sensation, and another with that which gives out the mandate of the will, we can readily conceive, that a partial injury of the brain, a clot of blood for instance, may cut off one root, and consequently one of the functions; whilst the other function of the nerve remains entire: but I must allow, that this appears rather too mechanical an explanation; and I return to my first position, and allege that the different functions of the brain are variously influenced by the same cause. I have repeatedly made a dissection of the brain in the case of acute hydrocephalus, when the ventricles were largely distended, where there was a free communication betwixt the lateral cavities, and an equal diffusion of the water:

here we might have expected that there would be a general oppression; but so far otherwise, the sides of the body were differently affected, whilst one side lay immoveable, the other was in continual motion. The arm and leg of one side were continually convulsed. The muscles of one side of the face agitated, and the eyes and tongue rolling, but always with an inclination to the same side which was convulsed. I confess to you, that, witnessing so different an effect as that of palsy on one side, and convulsion on the other side of the body, from one and the same cause operating on the brain, the subject has appeared to me so obscure and difficult, that I have never ventured to grapple with the question; and I send you these crude remarks to show you how willingly I would give you assistance if I could."

If we could show that the nerves of sense agree in their origin and appearance through their course, and differ from those of motion in both these respects, whilst, at the same time, they agree with one another, there would be a stronger ground for the distinction supposed betwixt nerves of sense

and of motion; but, till this be demonstrated, the question must be considered as involved in great obscurity.

The opinions of Dr. Phillip and Mr. C. Bell, in some respects similar to those of Erasistratus and Herophilus, seem to receive some support from observations made respecting the nerves of the organs of sense.

We see, for the immediate purpose of *vision*, the optic nerves distributed in very minute ramifications, over the retina of the eye, where they form a sort of nervous pulp, whilst the nerves for the various *motions* of the eye, the oculorum motores, the pathetici, and the abducentes, have no resemblance to the optic nerves, either in their origin, their appearance, their course, or their distribution. The nerves of the organ of the sense of smelling, also differ in various respects from those which supply nervous power to the muscles of the nose. — The pair of nerves, called auditory, consists of two parts, the *portio mollis* and the *portio dura*; the first of which is distributed through the internal ear for the sense of hearing, whilst the other goes to

the muscles of the external ear and face, for the purposes of motion. — The *muscles* of the tongue are supplied from the nerves of the ninth pair; while those which go to the *papillæ* of the tongue, for the sense of taste, are derived from a twig of the inferior maxillary branch of the fifth pair, and, in like manner, we find, as Galen has indeed remarked, that the papillæ of the skin, the immediate instrument of the sense of touch, are supplied with nervous power from sources very different from those which furnish nerves to the superficial muscles.*

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* Etmuller observes, Credibile est, papillas cutaneas esse tactûs organum, ideoque hic ratio reddi potest, cur superstite motu sensus potest aboleri, viz. quia motus per nervos fit, sensus per papillas hasce.

CHAP. V.

Of the Causes of Palsy.

The chief *predisposing* causes of general palsy, are those which I have enumerated and explained in the first volume of this work, as the predisposing causes of apoplexy; such as advanced age, hereditary feeble constitution, and especially a leucophlegmatic, pituitous, or dropsical habit. The *exciting* causes of palsy also resemble those of apoplexy, as will be particularly pointed out in the consideration of the several species of the disease.

With the exception of paraplegia, paralytic affections, in a very great proportion of instances, occur in somewhat advanced age, or in the decline of life, especially in constitutions weakened by disease; yet younger persons, if hereditarily predisposed to palsy, are liable to its attacks.

That extremes of heat and cold may occasion palsy, is evident from many cases adduced by authors. Hippocrates

says, when persons have passed their fiftieth year, defluxions taking place from the head, cause them to become paraplectic, if the head be suddenly exposed to the heat of the sun, or to great cold.*

Insolation and a too frequent use of the warm bath, give occasion to this disease; and also the immoderate use of hot diluting liquors. — Hippocrates, Galen, Cælius Aurelianus, Celsus, and others of the ancients, consider cold, especially when conjoined with moisture, as powerfully predisposing to palsy. Hippocrates, in his first book, *De Morbis Popularibus*, speaking of cold and moisture conjoined, says, in this constitution of the winter, paraplegiæ began, and affected many, of whom some died in a short time. Galen asserts, that paralysis is often produced by cold; and adduces several instances in which it

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* Καὶ ὁκόταν τὰ πεντήκοντα ἔτεα ὑπερβάλλωσι, καταῤῥοὶ ἐπιγενόμενοι ἐκ τῆ ἐγκεφάλου παραπληκτικοὺς ποίεισι τοὺς ἄνθρώπους, ὁκόταν ἐξάιφνης ἡλιωθεῶσι τὴν κεφαλὴν ἢ ριγώσωσι.

Hipp. de Aere, Aquis et Locis, p. 18. ed. Hieron. Merc.

This word παραπληκτικοὺς, has been by some translated semisyderatos.

was clearly referable to that cause. Celsus says, that resolution of the nerves especially prevails in wet weather. Modern writers, particularly Hoffmann, Hollerius, and Huxham, confirm these observations. The case of a young man is described, who lost the power of speech and the use of the right side, by sitting at an open window, in a very hot room, with his neck exposed to a current of cold air. From this paralytic affection he recovered; but, after a few weeks, both the aphonia and the palsy returned, in consequence of a sudden and violent fright.* Dr. Powell, in the fifth volume of the Transactions of the College, mentions several cases of paralytic affections from cold. Dr. Darwin relates the case of a gentleman, who was seized with palsy while in the cold bath.†

By a report from the records of the Army Medical Board, with which I have been favoured by Dr. Gordon, at the desire of my friend, Sir James M'Gregor, it appears

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* Hoffman, &c.

† Darwin, Diseases of Volition, class iii. 2. 1.

that the chief exciting causes of apoplexy and palsy, as they occur in military service, are intoxication, exposure to the sun, drinking cold water, and bathing in cold water; and that a predisposition to these diseases is produced by long-continued attacks of fever, visceral diseases, epilepsy, and dysentery.*

Dr. Gordon has given me an account of two cases; one of apoplexy from intoxication, marked by a purple or livid face, stertorous breathing, dilated pupils, slow pulse, &c.; and the other the case of a trumpeter, who, at the early age of fourteen, on returning from bathing, fell down insensible, with stertor, dilated pupils, and a very slow and full pulse. The subject of this last case was of stout make, large head, and short thick neck.

From the inspection of the annexed table †, it appears to me, that the proportion of cases of apoplexy and palsy, as they occur in the army, is very small; a circumstance which may perhaps be explained by observ-

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* Vide Report in the Appendix.

† Vide Appendix.

ing, that soldiers generally quit a military life before they arrive at the age when these disorders most frequently occur; and that those who are strongly predisposed to them are, as Dr. Gordon has observed, on that account refused admission into the army.

Palsy may also be occasioned by violent passions of the mind, particularly by fear, grief, and anger. Many instances of this kind might be adduced from Lieutaud and others.

Paralytic affections not unfrequently arise from, or are connected with, other diseases, particularly apoplexy, epilepsy, gout, rheumatism, scurvy, and scrofula; the suppression of customary evacuations and effusions, such as cessation of the usual perspiration, the stoppage of the menstrual or hæmorrhoidal discharges of blood, and the drying up of old sores and issues.

M. Portal relates the case of a woman of a full strong habit, who, for a long time, constantly experienced strong convulsions in the left inferior extremity, just before the accession of the menses, which did not

abate till after the discharge of a considerable quantity of blood. At about forty years of age, when the menses ceased, the parts which had been convulsed, became completely paralytic. This person afterwards was affected with convulsions in the left arm, and she died comatose.

On examination, the right side of the spinal marrow was found softened, and of a very red colour; whilst, on the left side, it appeared quite sound through its whole extent. This observation proves, says Mons. Portal, that a læsion of one side of the spinal marrow, as is the case with the medulla oblongata, may give occasion to convulsions or palsy on the other side of the body. *

A variety of noxious powers applied externally or internally may give occasion to this disease; an account of which will be given under the head Partial Palsy.

With respect to the causes of *Hemiplegia*, I wish to remark that they are more especially those of apoplexy. Palsy in this

* Anat. Med. tom. iv. p. 116.

form is almost always preceded by an apoplectic fit, of greater or less duration and violence; the causes, therefore, of both are similar. Hemiplegia may indeed be occasioned directly, and without the intervention of apoplexy; as by injuries done to the head from falls and blows, but cases of this kind very seldom occur. The causes of these diseases, when they act generally and powerfully, seem to produce apoplexy, and to give occasion to palsy when they act partially, or with less violence; so that, by an increase of power of the cause, palsy may terminate in apoplexy; and by a diminution of it, apoplexy may terminate in palsy. Dr. Cullen says, "the compression occasioning hemiplegia may be of the same kind, and of all the different kinds that produce apoplexy; and therefore either from tumour, over-distension, or effusion:" and almost all who have written on these diseases, agree in opinion with Dr. Cullen on this subject.

Pressure on the brain has for many years past been considered by physiologists as the chief, if not the sole cause, both of

apoplexy and of hemiplegia; but M. Serres, a physician of eminence, in a memoir lately published by him in the Annuaire Medico-chirurgicale, denies that pressure, in any case, produces either of those diseases. As M. Serres has taken great pains in investigating this subject, and as he had an opportunity of seeing many cases of apoplexy and palsy, and of examining the bodies of persons who died of these diseases, during an attendance of several years at the Hotel Dieu, and the Hospital de la Pitie, his experiments and observations, and the conclusions which he draws from them, respecting apoplexy and palsy, are, I think, highly deserving of our consideration.

With a view to prove that pressure on the brain ought not to be considered capable of producing apoplexy and palsy, M. Serres instituted the following experiments.

As apoplexy in man chiefly occurs in the decline of life, he selected an old dog as the subject of his first experiment. He trepanned the middle part of the cranium of this animal, over the superior longitudinal

sinus, and introduced a very fine bistoury, so as completely to perforate the sinus, and stopped the external opening in order to confine the effused blood to the interior. The dog was then let loose; he ran about the room trying to make his escape. Three hours afterwards he appeared so little altered from his usual state, that it was doubted whether an effusion had actually taken place or not. On opening the cranium, however, a very large clot of blood was found in the great interlobular scissure, and another, somewhat less, upon the left hemisphere. — Another experiment of the same kind was made upon a young dog, with the same result. — These experiments were repeated many times upon rabbits and birds, and always with similar effects: no somnolency was occasioned, nor any of the symptoms which accompany apoplexy.

M. Serres then proceeded to try the effects of effusions of blood forced into the ventricles of the brain. He trepanned a dog as before, over the middle part of the superior longitudinal sinus, and introduced a very small bistoury into the great interlobular

scissure; he pierced the corpus callosum, and so directed the point of the instrument to the left, as to enter the ventricle on that side. He then withdrew it, and closed the external opening. The animal, for about a minute, was affected with vertigo; he was dull through the whole day, and his pulse was a little agitated, and there was a considerable alteration in his appearance: his sleep in the night was disturbed; in the morning he walked about the laboratory, and appeared less indisposed than on the preceding evening; but there was no somnolency. On opening the cranium, the effused blood was found to have filled the great interlobular scissure, and to have penetrated into the left ventricle, which contained an ounce and a half of it. A small cavity was found in the anterior part of the corpus callosum. A rabbit two months old was subjected to a similar experiment, and with similar consequences.

After this, M. Serres proceeded to try the effects of artificial cavities made in the substance of the brain. For the subject of this experiment he chose an old dog, and made an opening over the lateral and some-

what posterior part of the longitudinal sinus; the bistoury pierced the left hemisphere, and brought away about two drachms of its substance; but no somnolency, or impeded respiration supervened. A cavity, containing a clot of blood of the size of a nut, was found situated at the middle part of this lobe. In another animal, he made a cavity in each lobe, without any apoplectic symptoms. He pierced through the two lobes in a pigeon, with a very large pin, with the same result; a transverse cavity made from one side of the cranium to the other, produced no somnolency. In another experiment he made an opening into the middle part of one hemisphere of the brain, and took away a certain quantity of cerebral substance; he then introduced a cork into the aperture, with a view to increase compression. A complete hemiplegia was the consequence; but there was no apoplexy or somnolency. These experiments were repeated in various ways, on birds, rabbits, and other animals, and always with the same effects.

Hence it appears, says M. Serres, that effusions of blood do not produce apoplexy,

whether lodged between the cranium and dura mater, or between that membrane and the brain; whether they occupy the great interlobular scissure, and thus lie upon the corpus callosum; whether cavities be made in the fore, the hind, or middle part of the hemispheres, or quite through them both; or, finally, whether, piercing through the corpus callosum, we penetrate into the ventricles of the brain, and fill these cavities. On whatever animals we try these experiments, whether on birds, on rabbits, or on dogs, the result is the same: and, by analogy, M. Serres concludes, that apoplexy in man ought not to be attributed to such effusions.

After having thus, by experiment, endeavoured to prove that apoplexy and palsy are not produced by pressure, M. Serres attempts, by reasoning, to show the absurdity of the doctrine which attributes these diseases to that cause. "Do the facts of pathological anatomy, relative to the brain of apoplectic persons, he asks, contradict my experiments? Has a constant agreement betwixt the accession of apoplexy and the formation of effusions, been ob-

served? Does the doctrine of compression from effusion account for the formation of apoplexies, their progress, and termination in death or in recovery?—On dissection, serous, sero-sanguineous, and bloody effusions," M. Serres says, "have been found within the cranium, without any symptoms of apoplexy preceding death. How is this to be accounted for? Can a cause exist without an effect? Apoplexies, we are informed, are sometimes in their course subject to paroxysmal revolutions. How is this to be understood on the supposition of compression from effusion?—It is well known that apoplexies accompanied with effusion may be cured. In these cases, what becomes of the effused fluid? Is it absorbed, or does it remain after the cure?" — M. Serres mentions instances in which apoplexy has been cured, and the patient has continued well, although the effusion which accompanied it remained, and appeared after death. The effect of these fluids, then, in man, he says, is the same as that which we have seen in brute animals; neither the origin, the severity, nor the duration of apoplexy are to be attributed to them.

The sudden accession of this disease, its periodical returns, which are sometimes observed, and experiments upon living animals, all lead us, M. Serres says, to the belief that effusion is the effect, not the cause, of apoplexy: a conclusion, he observes, very important for the pathology of the brain, and to which he requests the utmost attention of observers.

Having thus, as he imagines, overturned the old doctrines respecting the causes and distinctions of apoplexy, Mr. Serres proceeds to point out the foundation of his new division of the disease. — On carefully observing and comparing the symptoms of apoplexy, he perceived that it chiefly appears in two different forms; the one simple, without palsy, the other always combined with the loss of motion of one side or the other. The first, he calls *meningeal* the second *cerebral* apoplexy; the first consisting in a diseased state of the meninges of the brain, the second is a diseased state of the brain itself. In the meningeal apoplexy, the brain is healthy, but the membranes are disordered, and frequently fluids of various kinds are effused. In the

cerebral, the brain is altered in its structure, but no fluids are effused. Now M. Serres maintains, that hemiplegia is connected with the cerebral, but never with the meningeal apoplexy; that effusions are the effects of irritation of the meninges, or of ruptures of blood-vessels taking place in the course of apoplexies, but that they never, by compressing the brain, give occasion to the disease.

Out of one hundred cases of apoplexy which M. Serres had an opportunity of seeing, twenty-one, he says, were simple, and seventy-nine were complicated with palsy. In sixteen of the first description there was serous effusion in the ventricles and circumvolutions of the brain, separately or jointly; in one there was a sero-sanguineous effusion in the left ventricle; in two there was a similar effusion betwixt the tunica arachnoidea, and the pia mater upon the two hemispheres; and in the two others no effusion could be seen. In all these cases the brain was sound; but the meninges were impaired in different degrees. In those of the longest standing, in which the serous effusion was great, the

pia mater was injected, the vessels greatly dilated, and the arachnoid thickened and opake: in that case in which the ventricle alone was the seat of the sero-sanguineous effusion, the arachnoid was somewhat opake in its extent, red in the interior of the ventricle, which was studded with numerous miliary granulations. In the two cases of effusion upon the hemispheres, the arachnoid of the lobes was sensibly inflamed; and where there was no effusion, this membrane was dry, and thickened. — Does not this constant conformity, says M. Serres, betwixt the effusions and the alteration in the meninges, show that they are connected together? Do we not, in the different affections of the arachnoid and pia mater, see the source of the different effusions, and the reason of the absence of all moisture in the two last-mentioned cases? Ought not the irritation of the arachnoid of the ventricle, and of the portion covering the lobes, to be considered as having produced the sero-sanguineous effusion? A multitude of facts, says M. Serres, enable me to answer these questions in the affirmative; and I think I may take it as a

principle, that in this species of apoplexy the meninges are primarily and principally affected, and that the different effusions are only the effects of these alterations. — In the apoplexy connected with palsy, on the other hand, M. Serres observes, there are no serous or sero-sanguineous effusions in the natural cavities of the brain, or in the space betwixt the duplicatures: there is no alteration in the texture of the meninges; but the brain itself is materially altered in its structure, and appears to be exclusively the centre of activity of this apoplexy. Cavities are found in the substance of the lobes, the cerebral parts which surround them through their whole compass are inflamed, are of a reddish or yellowish colour, and hardened in proportion to the duration of the interval betwixt the formation of the cavity, and the death of the patient. The blood which fills these excavations is either coagulated, or half liquid, according as the cavities occupy the cortical or medullary substance, the corpora striata, the thalami nervorum opticorum, or the interior of the ventricles, into which, after having broken down their sides, it often penetrates. In

the complicated apoplexy, M. Serres thinks the palsy is a necessary effect of the organic alteration of the brain; whilst, in the simple apoplexy, the brain being sound, motion remains uninjured. Hence, he says, when an apoplexy in its course shows no traces of palsy, may we not presume that its seat is in the meninges, and that the brain is not the centre of activity of the disorder? and when, on the contrary, palsy becomes complicated with apoplexy in its course, that the encephalon and not the meninges is principally the seat of the irritation? Serous, sero-sanguineous, bloody, or purulent, effusions are the effects, M. Serres says, of irritation of the meninges, or the encephalon; or of arterial or venous ruptures which supervene in the course of apoplexy. If we properly interpret the facts, it appears easy to assign to these apoplexies their proper denominations. Hence, as is above mentioned, M. Serres calls the apoplexies without palsy, *meningeal;* and those combined with paralytic affections, *cerebral.* When apoplexy is combined with palsy, the latter affection, M. Serres thinks, is a necessary effect of an

organic alteration in the brain, and he thinks it possible for us to know, during the life of the patient, what kind of apoplexy we have to combat. If it be simple apoplexy, the patient moving his limbs when excited, the disease, he says, has its seat in the meninges: if, on the contrary, it is accompanied with hemiplegia, the mouth being drawn to one side, the practitioner may conclude the apoplexy to be cerebral. For an account of other distinguishing symptoms, and the general description, and particular observations respecting these apoplexies, I must refer to the Annuaire Medico-chirurgicale, for April, 1820.

Dr. Abercrombie's sentiments on this subject, with which he has been kind enough to make me acquainted, are in some respects, and in some degree, similar to those of M. Serres. "Palsy has been generally supposed," he says, "to be connected with pressure on the brain: the facts which I have mentioned seem to discountenance that idea, and to show the disease dependent upon various and very different morbid conditions of the brain, some of them the very reverse of

pressure. We see it connected with extravasated blood; serous effusion often in no great quantity; simple and recent inflammation of a small part of the brain; encysted suppuration; induration of a part of the brain; the soft and corrupted state, called sphacelismus cerebri; and with a complete destruction and loss of part of the brain, as in a remarkable case by O'Hallaran, in which great part of the right hemisphere was destroyed by suppuration, leaving a frightful cavern in the very substance of the brain. In this case, the only symptom was palsy on the opposite side, the man retaining his faculties to the very moment of dissolution. When we add to these the fact, that all these conditions of the brain may take place without paralysis, the subject appears exceedingly obscure and difficult."

The observations of M. Serres, and the facts which he has adduced are highly worthy of our attention, and great credit ought to be given to him for his diligence in improving the peculiar opportunities for information which he enjoyed; but I think

the conclusions which he has drawn from his reasoning are too general, and by no means strictly logical. He states, that he has, in many instances, thrown blood upon, and into the meninges, the cavities, and the substance of the brain, without producing apoplexy, or even somnolency; that upon the examination of a very great number of persons after death from apoplexy, he has found the meninges bearing evident marks of irritation (inflammation), accompanied with effusions of various kinds, and in various situations within the cranium; that sometimes he has observed the brain itself to have been injured in its substance, but without effusion; that in the former cases he has ascertained the preceding apoplexy to have been simple, and in the latter, combined with palsy; and that he has known many cases of apoplexy without effusion, and of effusion without apoplexy: and hence he concludes that he has overturned the doctrine of apoplexy and palsy from pressure, and has established a better system respecting the distinctions and nature of the diseases, than any hitherto presented to the world: but the accuracy of one of

these conclusions at least, may, I think, be reasonably doubted.

If M. Serres chooses to denominate those apoplexies *meningeal* in which the meninges appear to have been diseased, accompanied with effusion, the brain being in a sound state, and those *cerebral* in which there is no effusion, but the brain itself is disordered; if M. Serres chooses to make this division of the disease, I see no objection: perhaps it is better than that of sanguineous and serous. But, though physiologists may approve of his distinctions, I much doubt whether they will be disposed to admit that he has overturned the doctrine of apoplexy and palsy from pressure.

He has shown that blood has been effused in various situations within the cranium, without producing apoplexy; but he cannot hence fairly conclude that effusion never produces the disease. Since he admits that there is effusion in the meningeal apoplexy, how can he prove, even allowing it to be the consequence of what he calls irritation of the meninges, that the irritation, and not the effusion, is the immediate exciting cause of the disease. If compression by fluids were

the cause of apoplexy, M. Serres says there could be no apoplexy without effusion ; but the want of logical precision here is evident, unless we grant, what I believe few physiologists would admit, that compression from fluids is the *only* cause of the disease. That some degree of pressure may be made on the brain without producing either coma or apoplexy, may be conceded as proved by M. Serres's experiments ; but it by no means follows that a different or greater pressure would not produce these diseases ; indeed, both observation and experiment decidedly show, that compression does sometimes, according to its degree, give occasion, first to somnolency, and then to complete apoplexy. It is a fact perfectly well known, that after the operation of the trepan, pressure on the part deprived of cranium produces these effects : and innumerable instances might be adduced in which compression by depressed bone after accidents, has given occasion to coma and apoplexy.

These observations are confirmed by di-

rect experiments, which lead to positive conclusions; not to negative conclusions, like those of M. Serres. M. Portal trepanned the cranium of a dog; he compressed the dura mater and the brain, sometimes with his fingers, and sometimes with a bouchon of linen or of wood, and sometimes by water or mercury poured through the cavity made in the cranium. A funnel was adapted to the opening of the cranium, which was filled with water or mercury, so as to produce a graduated compression, more or less strong, upon the brain. In whatever way the experiment was made, it instantly produced the following effects—The animal ceased to bark; if the compression was increased, it became agitated by strong convulsions; if still further increased, a profound sleep took place, the convulsions ceased, and the respiration became stertorous. If the pressure was diminished, the breathing became more free, and the convulsions returned. This experiment was very often repeated by M. Portal, and always with the same results, except where the compression of the brain had been so

strong, that its substance had been weighed down, *affaissée.**

Mr. Astley Cooper has been kind enough to give me an account of an experiment which he made upon a dog, with a view to ascertain what degree of pressure the brain could bear, which in part confirms M. Portal's experiment. He trepanned a dog, and detached the dura mater in a circle from the inner table of the skull, to the extent of half an inch. He then pressed upon the dura mater, so as to depress it about the fourth part of an inch, and the dog exhibited no signs of uneasiness. He then pressed upon it to half an inch of depression, and the animal showed great signs of uneasiness, endeavouring to escape from his grasp with all his efforts: he then pressed to three quarters of an inch, and the animal became torpid, breathed laboriously, and according to the declaration of Mr. Davie, who assisted him in the experiment, the pulse became slow and irregular. Suddenly he removed the pressure, and in half a

* Portal, Cours de Physiologie Experimentale, p. 248.

minute the animal started from the table, turned several times round, as if giddy, and then staggered away.

Now, keeping these observations and experiments in view, if, in a case of apoplexy, preceded by sudden violent pain in the head, vertigo, somnolency, &c. we should find, on examination soon after death, that a vessel in the brain had been ruptured, from which a considerable quantity of blood was effused; and if no other disease could be detected within the cranium, would it not be natural and reasonable to conclude, that on the rupture of the vessel, the blood effused had first occasioned a pressure, sufficient to produce vertigo or somnolency, and afterwards by its increase, a complete fit of apoplexy? M. Serres, perhaps, would not allow that cases of this kind ever occur, but many such might be adduced.

In summing up the conclusions from his experiments, M. Serres says, thus, effusions of blood do not produce apoplexy, whether situated between the cranium and the dura mater, or between this membrane and the brain, &c. &c.; but he ought to have said,

thus it appears that effusion, &c. do not *always* produce apoplexy, or that a certain degree of pressure may be made on the brain without giving occasion to that disease. The principal conclusion, that apoplexy is *never* produced by pressure, is not warranted by his experiments and observations. M. Serres remarks, that remains of effused blood have been found, where persons have laboured under apoplexy, from which they recovered, and afterwards died of some other disease without the recurrence of apoplexy; but it is evident, that if what remained was less than what had been originally effused, it might be too little to afford a sufficient degree of pressure; so that such facts do not seem to support his theory.

The accounts of Lieutaud and Bonetus, of dissections after apoplexy and palsy, do not favour the distinctions of M. Serres, respecting these diseases. Lieutaud mentions a very great number of cases of various affections of the meninges of the brain found after death; such as *meninges inflammatæ, pustulosæ, meningum purulentia, meninges erosæ, meninges putres et syderatæ,*

&c.; but in no one of these cases had there been any thing like the simple apoplexy of M. Serres, or indeed any apoplexy at all.

On the whole, it appears to me, that in the consideration of this subject, physiologists have been led into error by the spirit of system. Some of them maintain that apoplexy and palsy *always* depend upon general or partial pressure within the cranium; whilst M. Serres, and his followers, assert, that pressure *never* produces these diseases. Is it not reasonable to say, that they sometimes do, and sometimes do not, depend upon this cause? and does not observation warrant the assertion? Is not the *degree* of pressure to be taken into the account? That the disease in question cannot always be traced to this cause, must be admitted; but I have no doubt that, in the generality of cases, apoplexy is produced by general, and palsy by partial, compression.

After this account of the causes of hemiplegia, I proceed to the consideration of those of *paraplegia* and *partial palsy*.

Hemiplegia, as above-mentioned, chiefly

depends upon morbid affections in the head; *paraplegia*, in a great proportion of cases, is produced by morbid affections of the spine and its connections. These generally come on gradually, and depend upon a constitutional disease; but, sometimes, they are suddenly occasioned by injuries done to the spine, or to the neighbouring parts, by falls or blows. Boerhaave mentions a case, in which, in consequence of a fall, all the parts below the os sacrum, the genital organs, the bladder, the rectum, the thighs, the legs, and the feet, were paralysed, and their functions never were restored. — Numerous similar instances might be adduced from authors. Paraplegia has been sometimes produced by the disease called spina bifida. Cases of this kind are mentioned by Tulpius and Huxham.

Dr. Abercrombie, in his Observations on the Diseases of the Spinal Marrow, has described several cases of paraplegia from various morbid affections of that organ; from inflammation of the spinal cord, or its membranes; from serous effusion in the spine; from the destruction of a portion

of the spinal cord; from blood extravasated in the vertebral canal; from a tumor in the lumbar vertebræ, in consequence of a fall; and from concussion of the spine.

The paraplegia from affections of the spine, Mr. Pott ascribes to a scrofulous disposition. The primary and sole cause of the mischief, he thinks, is a distempered state of the parts composing, or in immediate connection with, the spine, tending to, and most frequently ending in, a caries of the body, or bodies, of one or more of the vertebræ: and hence all the evils, whether general or local, apparent or concealed; the ill health of the patient, and, in time, the curvature.* Adults are by no means exempt from this disease; but Mr. Pott never saw it at an age beyond forty.

Although, in a great proportion of cases, paraplegia, especially in infants, depends upon the constitutional affection described by Mr. Pott, it sometimes, as I have before mentioned, arises, particularly in adults, from causes situated in the head; and both Dr. Baillie and Dr. Abercrombie adduce

* Pott, p. 20.

instances in which, on dissection after paraplegia, such causes have been actually found within the cranium.*

Dr. E. Harrison, in his Observations on Spinal Diseases, differs considerably from Mr. Pott, as to the causes and method of cure of paraplegia. Dr. Harrison thinks that Mr. Pott, in speaking of the causes of paraplegia, has attributed too much to caries of the bones in the production of the formidable disease, and he asserts that paraplegia may appear in its most complete form, independently of caries. Though Mr. Pott always found disease in the ligaments, and sometimes in them without any apparent affection of the bones, he unaccountably overlooked them, and limited his curative indications to the morbid state of the bones. It, however, appears from later dissections, says Dr. Harrison, that the vertebral bones are not always enlarged, or otherwise disordered, even when they are accompanied with a

* Abercrombie on Diseases of the Brain, p. 33. and Baillie, Trans. of the College, vol. vi. p. 22.

greater or less degree of deformity and crookedness of the spine. Dr. Harrison is "of opinion that we shall find the true cause of spinal complaints in the connecting ligaments, which seem to have lost part of their power of holding the bones together. These get relaxed, and suffer a single vertebra to become slightly displaced. The column, now losing its natural firmness, other bones begin to press unduly upon the surrounding ligaments; they, in turn, get relaxed and elongated, by which the dislocation is encreased, and the distortion permanently established. The direction becomes lateral, anterior, or posterior, according to circumstances; but the malady has, in every instance, the same origin, and requires the same method of cure." Dr. Harrison remarks, that persons often recover from spinal affections, which, he thinks, would not be the case if the principal mischief began in a bone, as Mr. Pott teaches; or in cartilage, according to others. "Had Mr. Pott attended carefully to the incipient stage, it is more than probable he would have found that the affection generally begins in the lig-

aments, and passes through them to the bones and cartilages." The more we become acquainted with spinal pathology, says Dr. Harrison, the stronger is our conviction that paraplegia ought to constitute a generic term, and include under it numerous species. Of these, one, and that comparatively of rare occurrence, originates in a carious state of the bones. In others, it takes place in the progress of the complaint, but in the greater number it never appears, though the health be generally impaired and destroyed by the mischievous effects impressed upon the constitution.*

A diseased state of the spine, and its connections, commonly produces paralytic affections of the lower extremities; but if the injury be in the higher parts of the vertebral column, the muscles of the superior extremities sometimes are also affected, and even general palsy may be thus produced. M. Portal, in his Anatomie Medicale †, mentions a curious case of al-

* Harrison on Spinal Diseases, in the Medical and Physical Journal, vol. xlv. p. 117.

† Page 117.

most universal palsy, depending upon a thickened and hardened state of the spinal marrow contained in the cervical vertebræ. In this instance the right side gradually became entirely paralytic, and afterwards the left side, in like manner, so that there was no power of motion in the trunk, or in the extremities; yet the patient breathed and swallowed without much difficulty, and other functions remained but little impaired. By degrees, however, his sight, and afterwards his hearing, failed, and were entirely lost. He could still, however, speak and swallow, though imperfectly, and respiration remained tolerably free. At length, the power of breathing and swallowing became very difficult; the pulse very weak, and so slow as to beat but from thirty-six to forty times in a minute; and, after remaining in this state for a short time, he died.

The causes of *partial palsies*, or paralytic affection of particular parts only, are numerous and various. These, as well as the general palsies, may be occasioned by derangements in the head or spine, as well as by a diseased state of the nerves themselves. Stupor and paralysis may arise

in one particular muscle, and yet the fault may not be in that muscle, nor in the nerve, nor in the arteries, nor in the veins, but in some particular part within the cranium. *

Though partial palsies are sometimes occasioned by injuries done to the spine, I believe they more frequently depend upon morbid affections of the nerves themselves. Galen was of opinion, that partial palsy often depends upon pressure on the nerves. If a nerve, he says, becomes thicker and harder than natural, the propagation of its power is hindered; or if it be compressed by some hard body, it cannot afford a free passage to the power. If compression be made on nerves, by cords or by the hand, by phlegmonous or schirrous tumours of neighbouring parts, or by luxated or fractured bones, the nerves become first torpid, and afterwards entirely lose sense and motion. †

Galen considers the application of cold

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* Boerhaave.

† Galen, De Symptom. Causis, lib. i. c. 5.

as a common cause of partial palsy, and mentions the case of a boy, who, whilst fishing in a river, was so affected by cold about the seat and the bladder *, that he became unable to retain the fæces and urine. Cold, he says, often injures a single muscle, especially that situated upon the superficies of the seat, as when a person sits upon a cold stone, or remains too long in cold water.

Forestus speaks of palsy in the hands, from cold and moisture applied to the neck, and of palsy of the bladder from a similar application to the back. †

Partial palsy seems occasionally to depend upon inflammatory action in the brain, or in the paralytic parts, when the disease is often accompanied with pain, which is sometimes very violent. I have received an account of cases of this kind from Dr. Abercrombie and Mr. C. Bell, to whom I am indebted for useful information on many points connected with my present

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* Καταψυχθεὶς τὰ περι τὴν ἕδρον τε και κύσιν.
Galen de Locis Affectis, lib. iv. c. 7.

† Forestus, Obs. 84. and 92.

enquiry. Dr. Abercrombie, in his communication to me, describes a case of much paralytic disease from a circumscribed morbid cause in the head. " A gentleman, aged 33, was seized with numbness and slight palsy of the left side, the numbness affecting also the left side of the face, the line being drawn with the utmost precision along the centre of the nose. He had no headache, and the pulse was natural. He was largely bled, and the affection went off in a few days; but from this time he was observed to be less acute in business, his memory was impaired, and he sometimes complained of his head. After three months, he was observed one day more confused and forgetful than usual, and in the night was seized with perfect apoplexy, which was fatal in twenty hours. On dissection every part of the brain was found in the most healthy state, except that in the centre of the right corpus striatum there was an abscess, regularly and nicely defined, no bigger than would have contained a small pea. In the lower part of the left corpus striatum there was a more irregular suppuration of great fætor

extending over a space about the size of a small bean. There was no serous effusion, and no other morbid appearance of any kind.

Mr. C. Bell has described to me a case of partial palsy, with great debility, preceded by inflammation of a nerve, accompanied with excruciating pain. In this instance, the inflammation was in the ulnar and fibular nerves, and the pain, which was of the most agonizing kind, had confined the patient for two years, and had quite subdued a powerful frame. He had in vain sought relief, says Mr. Bell, from some of our most distinguished friends, and he was left in a state of despair. Observing that the pain was confined to certain parts of the hands and feet, and that a distinct class of muscles were become paralytic and shrunk, Mr. Bell's attention was directed to the corresponding nerves, and he found them tender, and acutely sensible to the slightest pressure. The accessions of pain were periodical and alternating, the feet being generally first attacked, and afterwards the hands. By repeated purging, and the application of leeches along the

course of the nerves, together with other remedies to be described when I speak of the treatment of partial palsy, this patient was restored to health.

Among the causes of partial palsy, Mr. Bell reckons long continued exercise of particular muscles, or violence done to them; and he has favoured me with some instances in illustration of this opinion. He mentions one in which a literary gentleman experienced a feebleness, spasm, and paralytic affection of the thumb and fore-finger of the right hand, in consequence of long continued writing, in transcribing some valuable MSS.; and another, in which a young lady, by much exertion in attempting to lift a great weight, became affected with a complete paralysis of the muscles of the shoulder, so that the scapula hung down in a most remarkable manner, giving her the appearance of distortion.

There is another class of local palsies, Mr. Bell thinks, which are neither preceded by pain, inflammation, nor violence, and which do not proceed from disorder of the brain, but from irritation in the bowels. He remarks that the loss of motion from

this cause occurs often in children. "We frequently see," says Mr. Bell. "among those wretched Irish women who apply as out-patients to our hospitals, one with a child at her breast, with its arm hanging down entirely without muscular power. In such cases, I have invariably found, on questioning the mother, that there has been disorder in the bowels, with a passing of green stools, griping, and spasm, previous to the paralytic seizure of the limb." This paralytic affection, Mr. Bell says, will sometimes attack one or both of the lower extremities, and then it is confounded with loss of motion from disease in the spine.

Mr. Bell finishes the account of paralytic affections, with which he has favoured me, by proposing some queries which I am unable to answer, but which I here insert, as containing a striking description of certain facts. —"Let me ask you," he says, "what is the nature of that sudden interruption to the growth of parts which we so frequently witness? A finger — an arm, or leg — one side of the face — one eye — one testicle, will be suddenly interrupted in its growth — in the mean time the individual

increases in stature, and we find at length the arm or leg of a child, as it were, unnaturally joined to an adult. — Although there is here no paralysis, no want of muscular motion, yet, is it not owing to an affection of the nerves of the part?"

Among the exciting causes of partial palsies we may reckon the poison of certain mineral substances, particularly of quicksilver, arsenic, and lead. The fumes of these metals, or the reception of them in solution into the stomach, have often produced paralytic affections. We have innumerable instances of these disorders from such causes in persons who work in various preparations of those metals, as watergilders, workers in lead mines, plumbers, manufacturers of white lead, and painters; white lead, from its opacity, being generally employed as the basis of many kinds of paint. Palsies in the hands and arms are often seen in workmen of this description; and, perhaps, the disease, usually called colica pictonum, may be considered as a paralytic affection of the intestines; although it is attended generally with great pain. Colic of long standing, arising from

lead, is almost always accompanied with more or less of palsy in the upper extremities. The *fumes* of white paint may give occasion to partial palsy. I had an opportunity, some years ago, of seeing a case strongly illustrative of the truth of this remark. I was desired to visit a gentleman, who laboured under a paralytic affection of the whole of one side of his face, for which neither he nor any of his family could assign any probable cause. After numerous fruitless enquiries, I at last found that, for two or three nights, he had slept in a room in which there was a closet, the door of which had been recently painted, of what is called a dead-white colour. His bed was placed close to this door; and as the weather was warm, he slept without curtains, that side of his face which afterwards became paralytic, being turned towards the painted door. Under these circumstances, with the knowledge I had of the deleterious effects of lead in other cases, I had no hesitation in ascribing this partial palsy to the fumes arising from the paint. — Palsy, also, we are told, may be produced by the fre-

quent *external application* of lead, even in its metallic form. Dr. Percival, in his experiments and observations, mentions, from Dr. Wall, the case of a child about two years of age, the son of a plumber, who had been always remarkably healthy, who was seized with violent pains in the bowels, attended with a fever, and convulsive motions in the limbs. These complaints had been attributed to worms, and several medicines had been unsuccessfully given. When Dr. Wall visited him first, he found him paralytic on one side, and delirious. "Upon enquiring into the cause of his disorder, and particularly whether the child had been used to go into the room where they melted the lead, he was informed that he did frequently; and that it was a custom with his maid to let him run barefooted along the sheets of lead, whilst they were warm, with which he appeared to be much delighted." Dr. Wall did not then hesitate to attribute the disorder to this cause. *

* Percival on the Poison of Lead, p. 126, 127.

A person, a few years ago, was admitted into St. Bartholomew's Hospital, under the care of Dr. Powell, who was affected with palsy from this cause in a very extraordinary degree. The patient, who was a painter, was totally regardless of cleanliness in his business, and was in the habit of wiping his brush on the sleeves of his coat, so that he was particularly exposed to the fumes of the paint which he used. In this case, not only the hands of the patient were paralytic, but also the lower extremities, and the sphincter muscles of the bladder, so that he could not retain his urine. The plan of treatment, from which he received benefit, will be mentioned when I speak of the cure of palsy, from lead, and other pernicious mineral substances.

In the Medical and Physical Journal, the case of a young man is related, who had been afflicted with paralysis of the upper and lower extremities, with violent pains in the muscles and bowels produced by arsenic, which he had mixed with butter and wheat flour, and made into pills by rolling the composition in his hands. The disease, after some time, proved fatal.

The symptoms resembled those produced by the poison of lead, but were more violent.

Dr. Clutterbuck, in his account of the morbid affections, arising from the poison of lead, among others, mentions a paralytic state of the limbs. After describing the colica pictonum, or that species of colic which is produced by lead, he says, the extremities, in a short time, become affected, more especially the superior extremities. "A weakness in the hands is the first thing perceived. The patient is unable to grasp any thing with firmness. This weakness seldom extends itself above the wrists; but he is tormented with pains in the shoulders and upper arms, resembling chronic rheumatism. The weakness soon increases, so that he loses altogether the use of his hands. He is unable to support the hand in a line with the fore-arm, and can, with difficulty, lift it to his head. The fingers are incurvated, and he is unable voluntarily to extend them; not that they are rigidly contracted, for they can with ease be straightened by any extraneous force; they remain bent, because the tonic powers of

the flexor muscles exceeds somewhat that of the extensors. No diminution of sensibility in the skin is perceived to accompany this paralytic state of the arms; this affection seems confined to the muscles alone. The legs are seldom affected in the same manner, as the arms are found to be."*

The causes of the paralytic affections of the organs of sense seem sometimes to be those of general palsy above-mentioned, sometimes to consist in affections of the nerves distributed to the particular organs. The nerves, independently of the brain, are liable to many and various diseases; they may be hardened or softened; swelled or inflamed; they may be injured by wounds; they may be compressed by tumors, by the dilatation of blood-vessels, or by the violent contractions of muscles; they may be deranged by luxated or fractured bones, and many other causes.† Thus we plainly see how the parts to which they are distributed, may have their sensation and

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* Clutterbuck on the Poison of Lead, p. 10.

† Portal, Anat. Med.

motion diminished or destroyed. We are informed that obstruction, ulceration, or induration of the olfactory nerves have been found in cases of *anosmia;* a disordered state of the thalami nervorum opticorum, and of the optic nerves in *amaurosis;* and in like manner, morbid affections of the acoustic nerves in *cophosis;* and hence we may fairly consider morbid affections of the nerves as probable causes of these diseases. These partial nervous affections seem sometimes to be connected with general diseases, particularly scrofula.*

Among the exciting causes of paralysis, particularly of hemiplegia, none are more common, as we have already mentioned, than partial morbid affections of the brain; and it is curious to observe that when the cause is seated on one side of the brain, the paralytic affection almost always appears in the opposite side of the body. This is very generally admitted as a fact by the moderns, and was well known to the ancients. It is noticed in the writings of Hippocrates, Galen, and Aretæus, as

* Portal, Anat. Med. Morgagni, Ep. 13.

well as in those of Valsalva, Morgagni, Lancisi, Santorini, Haller, Malpighi, Forestus, Scarpa, and others. Mr. Serres speaks with the utmost confidence on this subject. He says that he has dissected with attention, one hundred and seventy-one bodies of persons who had died of cerebral apoplexy with complete hemiplegia, and that in every case he found the hemisphere of the brain opposite to the paralytic affection materially altered in its structure; that he had examined the brain of forty-seven hemiplegiac persons who died in the Hôpital de la Pitie; and that he had forty-seven times seen disorganization in the lobe of the brain opposite to the paralysed side; that he had received from the hospitals of the Saltpetriere, the Bicêtre, and the Hotel Dieu, about one hundred and fifty brains of hemiplegiac persons, and always without a single exception, the alteration in the encephalon was in the lobe opposite to the side affected. Hence he asserts, that the cerebral disorganization always occupies the lobe opposite to the side deprived of motion, in the cerebral apoplexy. M. Serres allows that state-

ments very different from his, are to be found in authors, but he is persuaded that they are erroneous.*

Physiologists have been much perplexed in endeavouring to explain this fact. They have very generally attempted to account for it, by supposing that a decussation, or crossing of the nerves takes place in their course; but there has been much difference of opinion with respect to the place and manner of this decussation. Aretæus, speaking of palsy, observes, " when its origin is in the head, if on the right side, the parts on the left become paralysed, if on the left, those on the right are affected." The cause of this, he says, is a change which takes place in the beginning of the nerves, for the right nerves do not go, in their course to the right, straight on to their ends, but at their origin they take a direction towards each other, so as to decussate in the form of the letter † X.

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* Annuaire Med. Chirurg. vol. i. p. 329.

† Ην δὲ κατάρχη κεφαλὴ, επὶ μεν τοῖσι δεξιοισι τὰ λαιὰ παραλύεται, δεξιὰ δὲ ἐπ' αριςεροῖσι· αἰτίη δὲ των ἀρχων των νέυρων η ἐπαλλαγή· ου γὰρ κατ' ἰξίν τὰ δεξιὰ επὶ δεξιὰ

Lancisi refers this phenomenon to a decussation of fibres in the corpus callosum, and Santorini in the corpus pyramidale.

Some have thought that a decussation takes place in the medulla oblongata, or the medulla spinalis. Sœmmering says immediately below the origin of the lingual nerves, medullary fibres begin to cross each other, but neither he nor Haller, who entertained the same opinion, have adduced sufficient ground for it.

Dr. Yelloly, in an ingenious and elaborate paper published in the first volume of the Transactions of the Medico-chirugical Society, discusses this subject very minutely. "From the accounts," he says, "which I have given of the observations made with regard to the structure of the medulla spinalis, by some of the principal authors, there seems to be no sufficient evidence for believing that there is a regular decussation of the fibres of this body, or

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ὁδοιπορέει μέσφι περάτωνδε, ἀλλ' ἔμφυτα τῇ ἀρχῇ εὐθὺς ἐπ' ἐκεῖνα φοιτῇ, ἀλλήλοισι επαλλαξάμενα εις Χιασμὸν σχήματος.

Aret. de Caus. et Sympt. Morb. Diut. lib. i. c.7.

a propagation of nervous influence from one side of it to the other. Galen states with precision, the effects of dividing the spinal marrow at different parts of its course transversely, and then goes on to the consideration of longitudinal and semi-transverse divisions. Where the spinal marrow was divided longitudinally, he found that none of the nerves which were derived from it on either side, were paralysed; when transversely, that the nerves only were paralysed, which were directly below the part divided on the same side. If it be true, that in the spinal marrow the fibres or other medium of the propagation of nervous influence, decussate in such a manner, that the influence afforded to the nerves of one side is supplied from the other, it seems to follow, that a longitudinal incision, such as was made by Galen, will have the same effect as a transverse one, in producing a paralysis of both sides; for if the propagation is either oblique or transverse, a longitudinal incision must interrupt it." *

* Med. Chir. Trans. vol. i. p. 192.

From the experiments of Galen, and an experiment made by Mr. Astley Cooper at Dr. Yelloly's request, which confirms the accuracy of Galen, Dr. Yelloly thinks it extremely improbable that there is any decussation in the course of the medulla spinalis; but, from some circumstances attending Mr. Cooper's experiment, he infers that the two sides of the medulla spinalis are not perfectly independent of each other. "Much of the reasoning, and many of the facts which render it probable, that nervous energy is propagated directly downwards in the spinal marrow, and does not decussate, seem to apply likewise to the medulla oblongata; for the one is regarded by anatomists as the mere continuation of the other, and by many of them is considered as not at all different in structure." * Santorini's opinion, with regard to the place in which decussation is effected, is, that it occurs in the tuberculum annulare and medulla oblongata. The former idea is somewhat probable, Dr. Yelloly thinks, since

* Med. Chir. Trans. vol. i. p. 201.

the tuberculum annulare is the first link in the chain of communication between the encephalon and spinal marrow; since there is reason to suppose, that the full effect of nervous influence is not produced till an union of the cerebrum and cerebellum takes place, which seems to be effected in the tuberculum annulare; and since the circumstances, which he has noticed in the course of his paper, are adverse to the idea of decussation occurring either in the medulla oblongata or spinal marrow. In an endeavour to discover the particular seat of decussation, supposing that it exists, the proper object of inquiry seems to be, not so much as to the place where there may be any real or apparent crossing of fibres, as with regard to that, at which the effects of an injury in any part of the encephalon cease to be propagated in the side in which it was inflicted. Much important information on this point might be obtained by a minute attention to the effects which pressure on particular parts of the brain might have on particular nerves; and if it were found that pressure on the origin of such nerves as arise from the cerebrum or cere-

bellum, or their crura, previous to their union, affects the same, and not the opposite side of the body, it would furnish some degree of support to the former part of Santorini's opinion."*

Doctors Gall and Spurzheim have attempted to demonstrate the place of nervous decussation. "When we separate from each other," they say, "the two inferior cords of the medulla oblongata and spinal marrow, we see that they are separated by a pretty deep fissure, the bottom of which is occupied by transverse medullary filaments. This fissure is only interrupted at one place, which is only two or three lines in length. The fibres of the pyramidal eminence of one side form there three or four filaments, as the hairs of a mat, and which are blended afterwards with the rest of the medullary cord, into which they thus enter obliquely." A committee of the French National Institute seem to regard this circumstance of structure, as accounting for the production of paralysis in one side of the body, by injury on the opposite side of

* Med. Chir. Trans. vol. i. p. 213.

the brain, but Dr. Yelloly thinks that this structure does not account for the phenomenon in question. He is of opinion "that, in as much as the glosso-pharyngeal or lingual nerves, which are affected by pressure on the opposite side of the head, arise from the medulla oblongata *above* the part at which this crossing is described to take place, the decussation at this place, which is confined to a very small portion of the vertebral column, does not account for the production of paralysis in one side of the body from injury in the opposite side of the brain."

Notwithstanding the observations and reasonings of anatomists and physiologists on this subject, much obscurity remains; yet, on the whole, I think it seems more probable that a decussation of nerves takes place in the tuberculum annulare than in any other part. If the minute structure of the brain were better developed, if it could be shown to consist of converging fibres, we might better understand how injuries done to one side of the brain, especially in the higher parts of the hemispheres, might produce palsy on the opposite side of the

body; but though such a fibrous structure of the brain has been supposed to have been seen by Leuwenhoek, Bidloo, Cowper, Gall, and Spurzheim, and others, its existence has not been satisfactorily proved.

CHAP. VI.

Dissections, Diagnosis and Prognosis.

The appearances, observed within the cranium on the dissection of persons who have died of palsy, very much resemble those after apoplexy, which have been already described, particularly effusions of various kinds, tumours, and other compressing causes, and læsions of the brain. Blood and serum, more especially the latter, have been often found, as also effusions of serum in various parts, and in various quantities *; sometimes between the cranium and the meninges; in the meninges, or between the pia mater and the brain; sometimes on the surface of the brain; amongst its intergyral spaces; in its ventricles; and through its sub-

* Bonetus.

stance: and some cases are mentioned by authors, of such effusions in the cerebellum, and in the medulla spinalis. Abscesses in the brain, and pus effused between the cranium and dura mater; and also læsions of the brain, from wounds, have been observed after palsy; and in one case a quantity of concrete blood was found filling the ventricles, in consequence of a rupture of the plexus choroides.* Instances of a flaccidity and softness of the brain have been frequently seen after palsy. Valsalva mentions a case of this kind; and several French physiologists have lately observed, and minutely described this appearance. Various morbid appearances in the head after palsy, in consequence of apoplexy, have been recorded.† These are chiefly blood in a concrete or grumous state, in different parts; in the ventricles, but more especially, in cavities in the substance of the brain. Sometimes blood has been found in a fluid state, and serum in several instances.

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* Bonetus. † Lieutaud.

In one case, a considerable quantity of serum was seen between the meninges and in the ventricles; the corpora striata showing something like marks of gangrene. Various diseased appearances of the corpora striata in these cases, and some, of the plexus choroides, have been described. Willis, after palsy of long continuance, often found the corpora striata in a diseased state; and Morgagni confirms his observations, as well as Peyrouse, who, in one instance discovered a hard tubercle, of about the size of a bean, in the middle of the corpus striatum, which had given occasion to hepimlegia. Dr. Abercrombie, in investigating the morbid conditions connected with the various forms of paralysis, remarks, "that in the cases which pass into apoplexy, the same appearances are observed as in the apoplectic attack: extravasations of blood; in many cases, serous effusion, often in small quantity;" and he quotes cases from Morgagni, in one of which a man had "loss of speech, and hemiplegia of the left side, and died in ten days, two ounces of

blood being in the right lateral ventricle. Another, with the very same morbid appearances, had paralysis of the left arm only, and died on the fifth day. In a third, who had palsy of the left side, and died apoplectic in twelve hours, blood was found to have passed into all the ventricles. In some of these cases, palsy appears on both sides before coma is induced, as in a case by the same writer, in which there was palsy of the whole left side, and of the right arm. Blood was seen in all the ventricles, but it seemed to have come from the right ventricle, the substance of the brain there being lacerated. In other cases, complete palsy of both sides has been observed before apoplexy took place. Extravasation on the surface occasions palsy on the opposite side, and, as the quantity increases, seems to induce coma. On the other hand, extravasation may take place in all these situations, inducing fatal apoplexy, without having induced paralysis." *

Among the appearances after hemiplegia

* Abercrombie, part ii. p. 42.

and paraplegia, accompanied with affections of the head, tumours, indurations, schirrus, and suppuration, have been found in various parts within the cranium.* After partial palsies the nerves themselves are often observed to have lost much of their substance; and, as Mr. C. Bell has remarked, much of their white opacity. This ingenious physiologist says, that nerves, if not employed, degenerate into a sort of cellular membrane.

On the dissection of a very great number of persons, who had died of cerebral apoplexy, accompanied with hemiplegia or other palsies, M. Serres found many marks of disease within the cranium, such as serum and blood in different states and proportions, and in various parts, but chiefly in the ventricles of the brain. The most constant and remarkable morbid appearance, however, was that of injury done to the substance of the brain. In many instances, he observed cavities in different parts of the brain, but chiefly in the cor-

* Abercrombie, part i. p. 2.

pora striata, and thalami nervorum opticorum, generally containing coagulated blood. M. Serres gives a particular account of the appearances on examining the head of a person who died of cerebral apoplexy, with *complete* palsy, in which he expected to see a cavity in each hemisphere, and was surprised to find that the superficies of the brain was quite healthy, and that, on cutting the lobes, section after section, with the greatest attention, he could perceive no organic alteration. This was the first time, says M. Serres, since my attention had been directed to cerebral apoplexies, that I had found the lobes sound in a person who, during life, had laboured under a manifest palsy; and, whilst I was reflecting on the singularity of the fact, my house-pupil discovered a bloody cavity in the middle of the annular protuberance. All this part of the encephalon, M. Serres remarks, was destroyed by the cavity which contained in its centre the clot of blood; and thus was explained the general palsy produced by a single attack, which, reasoning from former observation, he had referred to two hemiplegias.

Such, says M. Serres, are the principal appearances within the cranium of persons who have died of palsy, or of apoplexy and palsy combined, especially in cases of hemiplegia. M. Serres positively states, that in all cases in which he had remarked that palsy was absent during the course of apoplexy, the brain was uninjured, but the meninges were affected in different degrees, and with these different degrees of alteration the different kinds of effusion coincided. On the other hand, he asserts that in apoplexies accompanied with palsy, he found an evident and constant relation betwixt these cases, and disorganization of the encephalon. M. Serres maintains that all apoplexies have their seat in the encephalon, or in its membranes.

Much læsion of parts within the cranium have been sometimes found after paraplegia, as it occurs in adults, independent of a diseased state of the spine; for an account of which I refer to Dr. Baillie's paper in the sixth volume of the Medical Transactions of the College of Physicians, and to Mr. Copeland's treatise.

M. Rochoux, a French physician, in his account of organic læsions observed after death from apoplexy, speaks of effusions of blood in the brain, which, he says, are generally in the substance of the brain, and contained in sacs. This always happens, he asserts, in those palsies which follow apoplexy, and the number of caverns always corresponds with the number of attacks. The blood, in these cases, he says, is absorbed, and the sides of the caverns approach each other, and, as it were, cicatrize.

M. Riobe, house-surgeon of the hospital called La Charité, at Paris, though entirely unacquainted with the observations of M. Rochoux, has taken a similar view of the subject, has very diligently observed the various circumstances which accompany cerebral effusions, and has very ingeniously explained the particular manner in which blood effused in the brain becomes surrounded with a membraneous substance forming a cyst, by means of which it is absorbed, and taken back into the circulation. M. Riobe adduces a number of cases of recovery from apoplexy, in

which, after death from subsequent attacks of that or other diseases, dissection has shown appearances fully confirming his opinions on the subject. M. Riobe, from his reasoning and observations, draws the following conclusions: that apoplexy, in which blood has been effused in the middle of the brain, is curable; that sometimes a particular membrane is developed around the effused blood; that this membrane secretes a serous fluid which dilutes and dissolves the effused blood; that the blood thus dissolved is absorbed and entirely taken up by the vessels of this adventitious membrane; and that a great number of palsies, of which the effused blood in the brain is the exciting cause, gradually disappear in proportion to the absorption of the fluid. M. Riobe thinks that this membrane, after the absorption of the blood, sometimes gradually diminishes, and is at length effaced, or forms an adhesion by which the cerebral substance, torn asunder in the apoplectic fit, becomes re-united. He informs us, that in some cases, several of these cysts have been found in the brain

of apoplectic persons answering to the number of apoplectic attacks previous to that which proved fatal. Two, three, and even four such cysts found in the brain, have shewn that the patient, examined after death, had been two, three, or four times struck with apoplexy. For a more particular account of the observations of M. Rochoux, and M. Riobe, I refer to their respective works.

What has been already said in the history of palsy renders the *diagnosis* so clear, that we can be in no danger of confounding this disease with any other.

With respect to the *prognosis* in palsy, we find a great variety of opinions in different authors. The ancients seem very generally to have considered palsies of long standing as incurable. Forestus observes, that this disease is seldom, if ever, cured in old persons who, having lost their native heat, become weak, and generate viscid and cold humours. He thinks, however, that there is greater hope for paralytic persons when the disease happens in summer or in spring, than in winter or in

autumn.* Boerhaave was of opinion that palsies in the upper parts of the body, those nearest to the head, are more dangerous than those situated in the lower extremities. He says, that all palsies gradually descending from superior to inferior parts, are favourable in proportion as they leave the superior parts more free from the disease; but all palsies ascending from the inferior to the superior parts, are of the worst kind, and threaten† apoplexy. Sauvages, and many others, are of opinion that the more general palsies are scarcely ever perfectly cured. Dr. Abercrombie, however, takes a more encouraging view of the subject. He says, 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, he observes, which tend to shake this opinion; some recovering very gradually, so as in a few weeks or months to leave no trace of the disease. Dr. Aber-

* Forestus, Ob. 82.

† Boerhaave, De Paralysi, p. 706.

crombie thinks that paralysis, even of long standing, sometimes depends upon a cause which is capable of being removed almost in an instant, and he adduces examples in support of his opinion, which, he says, hold out to us a most interesting subject of research in the treatment of these, which of all diseases are usually considered as the most hopeless.*

It has been observed, that palsy in the limbs, when they are much wasted, is most difficult to cure.†.

As far as my own experience enables me to judge, the prognosis in the general palsies must be almost always unfavourable. I have seen many cases of recovery from palsy in a very considerable degree; but I do not recollect more than one or two cases of a complete restoration, both of sensation and motion, in the whole of the side of a person who had been affected with a perfect hemiplegia. When this species of palsy depends upon an injury done to one side of the brain, which is almost al-

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* Abercrombie, p. 69. † Portal.

ways the case, I am inclined to think that the mischief is seldom, if ever, entirely obliterated, and the disease wholly removed. On the dissection of persons after palsy, either evident disease is found in the brain, or marks of the existence of former disease, which had given occasion to the complaint; and although Messrs. Rochoux and Riobe have adduced good reasons for believing that fluids effused have been absorbed, and that cavities in the brain have been sometimes closed, yet the mischief may not have been completely removed, nor the brain perfectly restored to its healthy state; and whilst any morbid cause capable of producing palsy continues in any degree to exist, it is natural to imagine that palsy in some degree would remain. Reasoning from appearances after death from palsy, would lead us to conclude that the disease almost always, in a greater or less degree, does remain. Instances may, no doubt, be adduced of perfect recovery from palsy; but I am persuaded that such are of very rare occurrence. If persons affected with hemiplegia do not become apoplectic in a

short time, it often happens, that after a certain degree of amelioration, the disease becomes stationary, or very gradually proceeds, even for several years, before it terminates fatally.

CHAP. VII.

Treatment of Palsy.

In stating the treatment of palsy in general, I shall first mention that which should be employed in *hemiplegia*, the most common, and the most important species of the disease. Hemiplegia, as we have observed, is, in a very great proportion of cases, the consequence of apoplexy; therefore, the plan to be adopted, both for the prevention and the cure of the former of these diseases, is very much like that recommended for the latter; indeed, it differs chiefly in degree.

With the intention of preventing the accession of hemiplegia, moderate, or, in some cases, low diet, and gentle exercise, especially in the open air, are recommended, and will probably prove useful. The exercise ought to be such as may encourage perspiration, without heating the

body, or hurrying the breathing, and this some mode of gestation will afford. For persons not liable to fits of giddiness, and who are accustomed to riding on horseback, this exercise is the best. — Walking, with an attention to the circumstances above mentioned, may be tried; but in old men, and in men of corpulent habits, bodily exercise ought always to be very moderate.

" Where a predisposition to apoplexy is shown in early life, it is probable that a low diet, with a good deal of exercise, might prevent the disease; but when persons become advanced in life, before they take precautions, and are, at the same time, of a corpulent habit, and accustomed to full living, it might not be safe to put them upon a low diet; it may be sufficient to reduce their mode of living, especially with respect to animal food. All heating liquors should be abstained from, as much as former habits will allow; and the smallest approach to intoxication should be carefully shunned. For ordinary drink, small beer is to be preferred to plain water, as the latter is more ready to occasion costive-

ness, which, in apoplectic habits, is to be carefully avoided." *

In the apprehension of a paralytic attack, great attention ought to be paid to the state of the bowels, which should be kept regularly open by gentle laxative medicines.

Under these circumstances, I am of opinion that a discharge from the neighbourhood of the head should be excited and preserved, by means of blisters, issues, and setons. Such discharges are safe, and, I believe, powerfully prophylactic.

On the actual accession of hemiplegia, the treatment ought, at least in some degree, to be that formerly recommended in apoplexy, as the causes which, by their general action, produce the former, by their partial action give occasion to the latter. Dr. Cullen is of opinion, that in a hemiplegia which has subsisted for any length of time, there is probably an effusion either sanguineous or serous, and M. Serres almost always found a quantity of blood in cavities of the brain, which had been produced by

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* Cullen.

injuries done to that organ. Upon the supposition that hemiplegia depends on partial pressure upon or in the brain, the great object should be to remove that pressure, if possible, or to diminish its degree; which, perhaps, cannot be more rationally attempted than by depletion, by blood-letting, purgatives, emetics, diaphoretics, sialogogues, revellents, and discharges by means of blisters, issues, and setons. — The ancient physicians very commonly prescribed in hemiplegia the evacuation of blood, both general and topical; but especially the latter. Aretæus, Ætius, and Paulus Ægineta speak highly of the advantages of topical blood-letting by cupping the head itself, or the neighbouring parts, but in this practice they advise caution, and that the evacuation of blood should be moderate. Among the moderns, the advocates for blood-letting in apoplexy also recommend it in hemiplegia, but with caution; and those who are doubtful as to the propriety of this evacuation in the former disease, or who are unwilling to employ it freely, wholly forbid it in the latter. For-

restus*, under certain circumstances of palsy, admits the propriety of taking away a small quantity of blood, but some practitioners advise a free use of the lancet in this complaint. Mr. Hunter was of opinion that in hemiplegia we ought to extract blood very largely, especially from the temporal arteries. The following case is illustrative of the good effects of large and repeated bleedings, together with cathartics, in palsy. "An officer of the navy, of middle age and full habit, after having been drinking freely for about a week with some of his shipmates, and for three days having been much intoxicated, suddenly was attacked with hemiplegia. His tongue was affected so that his speech was almost unintelligible, and an universal tremor pervaded his frame. In this case the external jugular vein was opened, and about three ounces of blood were with difficulty obtained. A vein of the

* In plethora tamen et sanguinea resolutione, contusioni, ictu, aut casu, de venæsectione nulla est dubitatio; sed in omnibus ad exiguam quantitatem. Lib. x. obs. 75.

left arm was then opened, and eighteen ounces of blood were allowed to flow in a full stream: while the blood was yet flowing, the tremor disappeared, and his articulation became more distinct. Bye and bye he became faintish, and was laid in bed. After recovering a little, he swallowed twenty-five grains of calomel. In two hours afterwards, fourteen ounces more of blood were taken from the arm. On the morning following the evening in which the disease made its attack, his face was less drawn to one side, and he could move the whole right arm and leg, though with considerable difficulty. This improvement he dated from a most copious stool in the night, after which he had two more evacuations, all the three being of a very dark colour and most offensive smell. On the evening of this day, however, he again lost the power of moving the right limbs, and the face was considerably drawn on one side. Eighteen ounces of blood were then drawn, in a full stream, with considerable advantage. On the evening of the succeeding day he had in a considerable degree lost the power of moving the right limbs, and his face was

redder than usual. Fourteen ounces of blood were then drawn from the arm in a very large stream, and soon after the bleeding he acquired the power of moving the arm; twenty grains of calomel were given."* From this time he continued to improve, and about nine days from the paralytic attack he was able to walk without any difficulty, and at the end of a month he was quite well. In addition to the calomel, castor oil and a considerable quantity of other purgative medicines were given.

In the two following cases, venesection in hemiplegia was employed by Dr. Abercrombie with great success. "A man aged thirty-five, of a full habit, and intemperate, was suddenly seized with loss of speech and perfect palsy of the right side. Being bled to twenty-one ounces he spoke more distinctly. The bleeding was repeated after two hours, and he took strong purgatives. Next day the motion of the right side was considerably improved, but becoming more paralytic towards the

* Medical and Physical Journal.

evening, he was bled again to eighteen ounces. Purging was repeated, with blistering on the neck. On the third day, he was again better in the morning, and rather worse at night, and was again bled to fourteen ounces. By purging and spare diet, he then mended progressively, and in a few days was free from any paralytic symptom. An old and very poor woman, aged about seventy, thin, pale, and withered, having gone out to bring water from one of the public wells, on the morning of the 2d July 1818, fell down in the street speechless, and completely paralytic on the right side. Nothing was done till about two o'clock P. M., when she was found stupid, but not comatose; yet completely speechless and paralytic; her pulse of good strength, and about ninety-six. She was bled to fifteen ounces. Purgative medicine was ordered and cold applications to the head; on the 3d she was considerably improved both in speech and motion, but having become rather worse at night, the bleeding was repeated, and purgative medicine continued. From this time she improved gradually; at the end of a week

she was able to walk with a little assistance, and speak pretty distinctly; and by the end of another week she had entirely recovered her former health."*

In Dr. Home's clinical experiments and histories, a case of complete hemiplegia is mentioned, which was cured by a free evacuation of blood. "The patient was bled four times in seven days, and after each bleeding the symptoms gradually diminished. The blood was always sizy. Nothing else was done, except that a little nitre was given, and the patient's body was kept open by clysters; all the symptoms except a head-ache disappeared."† In the London Medical and Physical Journal for November 1816, we have an account of a speedy cure of complete hemiplegia by a very large evacuation of blood. On the first day of the attack thirty-eight ounces of blood were at once drawn from the arm of the side affected; on the second day twenty ounces from the other arm, and on the third day the disease disappeared. Many similar cases might be adduced.

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* Abercrombie, p. 15. † Home, p. 256.

My own experience on this subject, is in favour of the practice of blood-letting in hemiplegia, when accompanied with strongly marked apoplectic predisposition; and I do not recollect to have observed any mischief produced by it under such circumstances. I once, indeed, saw this species of palsy terminate in a fatal apoplexy soon after an evacuation of blood, in the case of a gentlemen seventy years of age, of a plethoric constitution, and free mode of living; yet I am convinced that bleeding, all circumstances considered, was in this case highly proper; nay, it is not very improbable I think, that by a more copious evacuation of blood, the total abolition of sensation and motion might have been prevented. We have some cases on record, in which hæmorrhage from the nose, or from the hæmorrhoidal or menstrual vessels, have relieved persons affected by paralytic symptoms, especially when connected with the stoppage of the piles or the menses. With respect to the treatment of hemiplegia, as far as relates to the propriety of blood-letting, and the extent to which depletion by that means may be safely

carried, it appears to me extremely difficult, if not impossible, with propriety to lay down any absolute general rules. Each individual case must be viewed in all its circumstances, and by a careful consideration of them, our practice should be regulated. Before we prescribe blood-letting in hemiplegia, we must investigate the age, strength, general constitution, and habits of the patient, and above all, the actual symptoms of the disease. In early, or even in somewhat advanced life, if plethora and the various symptoms formerly enumerated as tending to apoplexy were present, I should not scruple to bleed freely, both generally and topically. On the contrary, in great age, debilitated leucophlegmatic habit, dropsical tendency, &c., I should think it right to abstain altogether from this, and from every other powerful mode of depletion, unless there was an evident great determination of blood to the head, marked by flushing in the countenance, throbbing of the arteries, redness of the eyes, &c. In doubtful cases, indeed, the safest plan would be to evacuate blood only topically by leeches

or cupping glasses, and to proceed as circumstances may direct, carefully watching from time to time the effects of the practice.

M. Serres in some cases prescribed, with advantage, the opening of a jugular vein in hemiplegia; but the evacuation of blood, either general or topical, seems not to have been often recommended in these cases either by him or his colleagues in the Hotel Dieu, and l'Hopital de la Pitié.

With regard to depletion by purgative medicines in this disease, less caution is required. In all cases of hemiplegia, a free evacuation of the bowels is, I believe, not only safe, but necessary. Boerhaave was a great advocate for the use of purgatives in palsy. He says they do more good in certain cases of this disease than all other remedies put together, provided the body can bear their power: and Van Swieten asserts, that he has cured many palsies by hydragogue cathartics, repeated at proper intervals. Forestus advises opening medicines in palsy, beginning with eccoprotics and proceeding to the employment of

drastics. He recommends that they should be administered in the form of pills. * All writers agree as to the propriety of keeping the body open in hemiplegia, but the cathartics should be suited to the nature and circumstances of the case. The neutral salts and other purgatives called refrigerants, may be given where there is much determination of blood to the head, and in full habits ; but in debilitated, leucophlematic, and dropsical cases, the more stimulating purgatives, such as aloes, calolomel, scammony, colocynth, jalap, &c. may with more propriety be administered.

The French physicians lay great stress on the administration of stimulating clysters in the cure of palsy.

As to the use of *emetics* in hemiplegia, I wish to remark, that the generality of the practitioners of the present day seem to have less scruple in prescribing them in this disease than in apoplexy. Dr. Heberden, however, says, that we ought not in any species of the disease to excite vomiting

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* Magis conveniunt pilulæ.

by *strong* medicines. He seems to think emetics useful only by appeasing nausea and removing any thing offensive from the stomach. * Celsus under certain circumstances recommends emetics †; and Forestus thinks vomiting useful in all palsy, but that of the tongue.

In cases of debility and diminished action, where there appears to be no determination of blood to the head, emetics may possibly be beneficial by their exciting power. The French physicians are very partial to the exhibition of these remedies, and in the treatment of hemiplegia they seem to place great dependence upon them.

M. Serres and M. Lerminier seem to have prescribed emetics almost indiscriminately in hemiplegia. Tartarized antimony was given by them dissolved in a large quantity of water, and in various other forms. They found, however, that this medicine produced but little effect, unless in large and repeated doses, the stomach

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* Heberden, p. 302.

† Post cœnam utilis vomitus.

and bowels, under these circumstances, seeming to be in a great degree insensible to its action. The practice of giving emetics in hemiplegia is not very common in this country, yet it is recommended by some respectable practitioners, who are of opinion that the agitation produced by vomiting may be of use. Van Swieten thinks that emetics, as well as sternutatories, are not always safe.*

This practice may, perhaps, in some cases, be found useful, but in hemiplegia after apoplexy, especially in the beginning, and in plethoric habits, I should not venture to recommend it. The reasoning and facts adduced, respecting the propriety of the employment of emetics in apoplexy, apply also to hemiplegia. They have been given considerably in detail, in the first volume of this work, to which I beg leave to refer.

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* Verum satis patet validissimos illos concussus per vomitoria et sternutatoria adhiberi non posse, nisi viscera bona fuerint; vires satis firmæ, et nullus metus sit apoplexiæ a plenitudine vasorum, quæ rumpi possent in encephalo inter vomendum vel sternutandum.

Van Swieten, § 1068.

In addition to depletion by blood-letting, pnrgatives, and emetics, in hemiplegia, some authors mention diaphoretics, diuretics, and sialagogues; but no great dependance seems to have been placed upon them, nor does my own experience enable me to recommend them.

The above-mentioned observations concerning the treatment of hemiplegia, relate to the disease in its early state, and more especially while connected with apoplexy, under which circumstances, the practice may, in a certain degree, and with certain cautions, be that formerly at length described, when I treated of apoplexy. When, however, the disease has subsisted for a length of time; when the apoplectic symptoms have disappeared; when plethora, or marks of determination of blood to the head are no longer present, our mode of proceeding should be different; and certain remedies may be prescribed, which, under other circumstances, would be dangerous. These remedies are chiefly stimulants externally applied, or internally taken; of these we have a very great variety. The external applications are fric-

tions, blisters, sinapisms, fomentations, and warm bathing, electricity and galvanism. The chief stimulating internal medicines are volatile salts, acrid vegetables, aromatics, essential oils, and resinous substances.

The antients, and indeed the more early writers among the moderns, seem to have erred by a too early and indiscriminate employment of stimulants in palsy, which they always considered as a disease of debility, coldness, and obstruction. Dr. Cullen has made some useful distinctions respecting the treatment of this disorder. He is of opinion, that stimulants are highly dangerous in all cases of hemiplegia, succeeding to a paroxysm of complete apoplexy, or coming upon persons of apoplectic temperament, or with symptoms of apoplexy, from compression; under different circumstances, he thinks that stimulants may be advantageously prescribed.

Among the means of removing the torpor of palsy, the excitement of passions of the mind have been mentioned by authors, particularly sudden anger or terror.

Van Swieten, from Schenkius, relates the case of a man who, by sudden terror, recovered from hemiplegia, with which he had been affected for many years.*; and Boerhaave quotes from an Arabian author an account of a recovery from paralysis of one side, by a sudden emotion of the mind.† Similar instances might be adduced from authors; but from a knowledge of them we derive no practical advantage: the excitment of the passions not being sufficiently under our management and controul.

There is a story related by Herodotus, respecting the restoration of the power of

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* Alteri per plures annos jam hemiplectico, incassum tentatis omnibus auxiliis, dum domus deflagrabat, in quo decumbebat miser, ilico redit motus, et a summo ædium præcipitem se dedit, posteaque liber ab hoc morbo vixit.

† Prostat hic loci in Bibliotheca publica liber Arabicus, in quo scribitur, amatissimam Caliphi uxorem laborâsse paralysi unius lateris: Medicus consultus dixit se posse sanare, nisi metueret iram Principis; ille curam sibi gratam fore respondit; Medicus ergo conabatur pedes ægræ attingere, quod in Asia est signum impudicitiæ, unde illa valde irata voluit Medicum a se abigere, et hoc violento nixu mox sanata fuit.

Boerhaave, De Morb. Nerv. p. 688.

speech to the son of Crœsus by sudden terror, which Boerhaave has quoted in illustration of this subject; but, as it is in some respects contradictory, I do not here introduce it.

Of the stimulants above mentioned to be applied externally, there perhaps is none more safe and efficacious than friction by the hand, or by the flesh brush. I have, in several instances, seen very beneficial effects from a long perseverance in the use of this simple remedy. Friction may be rendered more powerful by stimulating liniments, of which we have many different kinds, such as the fossil acids and volatile alkalies, combined with oil or lard, with a view of rendering them less acrid and corrosive; essential and distilled oils; preparations from resins, gum-resins, &c. — Among the useful external applications for the purpose of restoring action and sensation, we may reckon blisters and sinapisms, especially the latter, which are perhaps the most powerful rubefacients that we can employ. Blisters and sinapisms are very generally recommended in palsy, because they are considered safe

and efficacious. One of the Greek physicians, however, very properly says, that when parts are entirely deprived of sensation and motion, we ought to be careful that sinapisms do not operate too much; the patient, through loss of feeling, not being able to judge of their effects.* Some practitioners are in the habit of applying blisters, or other stimulants to the head, immediately after the accession of hemiplegia; but I am of opinion, that we ought not to make such applications in plethoric constitutions, and especially when the disease is the consequence of apoplexy, till some blood has been taken away; and, I think, that when such stimulants are used, they should be applied on that side of the head which is opposite to the paralytic side; because anatomists have ascertained, as above-mentioned, that in a very great proportion of instances, the cause of hemiplegia is seated in some part of the brain, opposite to the side affected. Celsus recommends, in these cases, the

* Paul Ægineta, lib. iii. c. 18.

application of nettles to the surface of the part affected, and also mustard.*

When stimulants actually produce violent inflammation of the skin of the part to which they are applied, it is thought that they do not do so much good as a more frequent repetition of a more moderate stimulus. With respect to the whole of them, it has been remarked, that they affect the part to which they are applied, much more than they do the whole system, and are therefore safer in ambiguous cases; but, for the same reason, they are less efficacious in curing a general affection. The external remedies which may be applied to affect the whole system, are heat, cold, and electricity.†

In the treatment of palsy, much stress has been laid upon a moderate application of heat by bathing, especially in certain

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* Prodest etiam torpentis membri summam cutem exasperâsse, vel urticis cæsam, vel imposito sinapi, sic ut ubi rubere cæperit corpus, hæc removeantur.

Celsus, lib. iii. c. 27.

† Cullen.

mineral waters, such as those of Bath and Buxton. Several years ago a narrative of the efficacy of the Bath waters in various kinds of paralytic disorders, was published; in which we are informed, that betwixt the years 1775 and 1785, great relief, and, in some cases, perfect recovery, followed the external and internal administration of those waters. The cases of fifty-two persons affected with palsy are particularly related, of which some were cases of hemiplegia following apoplexy, and others hemiplegia without any assignable cause. A great number of these persons were dismissed cured. Some physicians have recommended the sudden application of *cold* water as a stimulant likely to be useful in hemiplegia. Dr. Cullen inclines to favour this practice. He says, cold applied to the body for any length of time is always hurtful to paralytic persons; but if it be not very intense, nor too long continued, and if, at the same time, the body be capable of a brisk re-action, such an application of cold is a powerful stimulant of the whole system, and has often been useful in curing

palsy; but if the power of re-action in the body be weak, cold may prove hurtful.*

Some practitioners speak doubtfully, some unfavourably, both of warm and cold bathing in palsy. On this subject I cannot give an opinion from my own experience; but, on the whole, the observations which others have made, would lead me to prefer, in palsy, the application of warmth by bathing, to that of cold; as the former is more under our command than the latter. If cold does not produce re-action, or if it give occasion to a very great re-action, it would, probably, do mischief.

Among the stimulating applications most strongly recommended in hemiplegia and other palsies, electricity may be mentioned. This powerful agent has been employed in various diseases, especially in paralytic affections, by the French and other continental physicians; and, as they inform us, with the greatest success.† Many mem-

* Cullen, vol. iii. p. 216.

† A book was published at Paris, in two volumes, so long ago as the year 1763, under the title Recueil sur l'electricité medicale dans lequel on a rassemblé les principales pieces publiées par divers savants sur le moyen de guerir en electrisant les malades.

bers of the Royal Society of Medicine at Paris, particularly a M. Mauduyt, made several experiments which appeared to be much in favour of the practice. The Abbé Nollet, the Abbé Lans, professor of experimental philosophy at the university of Perpignan, M. Segaud de la Fond, M. Jallabert of Geneva, and various German philosophers, speak highly of the efficacy of electricity as a remedy for various complaints.

M. Jallabert, professor of philosophy and mathematics at Geneva, was the first person who tried electricity in paralytic affections. He performed a cure on a locksmith, whose right arm had been paralytic fifteen years, occasioned by the blow of a hammer. He was brought to M. Jallabert on the 26th of December, 1747, and was completely cured by the 28th of February following. The report of this cure performed at Geneva, engaged M. Sauvages of the Academy of Montpelier, to attempt the cure of paralytics by electricity, in which he had considerable success. Many, however, were electrified without any advantage. In the year 1757, Mr. Patrick Brydone performed the complete cure of a

hemiplegia, and, indeed, an almost universal paralytic affection, in about three days. The patient was a woman, aged thirty-three, and the palsy was of about two years continuance.

Of the patients treated by M. Mauduyt, ten were materially benefited by the application of electricity, and a great proportion of those under the care of the Abbé Lans were restored to health by its use. De Haen was a warm advocate for the practice, and asserts that it never does harm. Several instances of the good effects of electricity in this disease are mentioned in the Transactions of the Royal Society, and in various medical journals, and other publications; but notwithstanding the numerous strong testimonies in favour of the employment of it in palsy, it seems of late years to have somewhat fallen into disrepute.

That electricity may be hurtful, and even in some cases, in which analogy would lead us to promise ourselves it might be of use, is evident from many cases, and particularly from one related by Dr. Hart, of Shrewsbury, in a letter to Dr. Watson, which was

read at the Royal Society, November 14th, 1754.*

Dr. Franklin electrified several paralytic persons in America, without any material advantage; and Mr. Cavallo, who has written a treatise expressly recommending the application of electricity as a remedy in various diseases, admits that it has often proved inefficacious, and sometimes fatal. He observes, that, in general, the application of electricity has been found to be of very little use in cases of disease of long standing. Van Swieten says, numerous experiments respecting the power of electricity, as a remedy, have been made by celebrated men, which prove both its great efficacy, and its danger if such experiments are not conducted with prudence; yet much good may be expected from it in paralysis, as appears from direct and faithful trials of its power. Applied in a certain manner, electricity is a most powerful stimulant to the nervous system, and therefore much has been expected from it in the

* Priestley's History of Electricity, p. 408.

cure of this disease; but as it is also a stimulus to the sanguiferous system, it has often been hurtful in those palsies which depend upon a compression of the brain, and especially when it has been so employed as to act upon the vessels of the head. It is only to be considered safe when its operation is confined to parts somewhat remote from the head; and as, when very strongly administered, it is capable of destroying the mobility of the nervous power, it should be used with moderation. Advantage is to be expected rather from a repetition of it, than from its force; and it seems particularly suited to the cure of those palsies which have been produced by the application of narcotic powers.* Where electricity has been prejudicial, it has probably been too violently applied. No greater force should be used than that which may be sufficient to remove, or alleviate disease; thus, shocks should never be used when a cure may be effected by sparks; sparks should be avoided when the

* Cullen.

required effect can be obtained by the wooden point, and if the metal point be thought sufficient, it should be preferred.*

From my own observations of the effects of electricity in paralytic affections, I venture to recommend a trial of it under the circumstances, and with the cautions point-

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* Mr. Cavallo mentions a curious influence which electricity has upon parts to which blisters have been applied. He says, "one circumstance attending some of the preceding cures, particularly that of the paralytic, related by Mr. Jones, was a fresh and copious discharge of the blisters which had been previously applied to the patients. This, I think, seems to be a pretty general consequence of electrification; at least, I have myself known many instances of it; particularly in one gentleman, whom I electrified for a paralytic complaint, and who had a blister applied to the back part of his neck. He informed me, that, in the night after his being electrified the preceding day, he found a much more copious discharge from the blister than at other times; though the operation was no more than his standing, for about a quarter of an hour, on the insulated stool, while sparks were drawn from the side of his face. From hence it appears not improbable, that, in some cases, blisters may be attended with peculiar benefit during a course of electrical treatment; in others, perhaps, it might be worth while to make use of electricity, merely to obtain a favourable discharge from the blisters." P. 67 and 68.

ed out. I have in many cases seen it materially useful, and I do not recollect a single instance in which it appeared to do mischief. Although Dr. Cullen, as above mentioned, places more dependence upon a repetition of electricity, than upon its force, I wish to observe, that from experience, it appears to me to be chiefly serviceable on its first application, and that its beneficial effects are by no means proportioned to the length of time of the employment of it. Dr. Franklin remarked, that the paralytic persons whom he electrified were generally restored for a few days in the beginning, but that they afterwards either did not mend, or that they relapsed into their former state.

I saw some years ago, a case of complete paraplegia, in which the good effects of electricity were at first extraordinarily great, but they were not permanent; for though the application of this power was for a considerable time continued, the patient experienced a diminution, rather than an increase of sensation and motion, in the parts affected.

Dr. Bardsley and others, express them-

selves strongly in favour of the employment of *galvanism* in paralysis. Dr. Bardsley relates some well-marked and decisive instances of the successful application of it in various forms of this disease, which he thinks will serve to encourage further trials, and consequently extend our limited knowledge of its medical powers.* In the application of galvanism in these cases, Dr. Bardsley recommends the method employed by Mr. Wilkinson; for instance, in a case of hemiplegia of the right side, accompanied by vertigo, loss of memory, and involuntary discharge of urine, he began with half a dozen plates (of two inches and a quarter square), and applied the conducting wires in such a manner, as to direct the galvanic influence through the brain. The sensation was powerful and unpleasant, but by degrees the patient was able to bear the power of a dozen plates. The galvanic fluid was likewise directed along the spine, and the upper and lower extremities, in as powerful a degree as the patient's feelings

* Bardsley's Medical Reports, p. 183.

would admit. In about a fortnight this person became entirely free from any appearance of disease, except a slight retraction of the muscles of the face, which was not attended with pain or any inconvenience. *

For a minute account of the cases of palsy under the care of Dr. Bardsley, treated by galvanism, particularly of one, most singular and deplorable, to which he calls our attention, as furnishing an unequivocal testimony in favour of the practice, I must refer to his work. Dr. Bardsley draws from his experiments the following general conclusions : — 1. That galvanism, judiciously administered, is a safe and powerful remedy in most paralytic diseases. 2. That as far as three comparative trials will allow an inference, the efficacy of galvanism in paralysis is superior to that of electricity. 3. That galvanism agrees with electricity in its sensible effects upon the body. 4. That when the brain is required to form part of the circle,

* Medical Reports, p. 186, 187.

the galvanic influence ought to be very cautiously administered. 5. If no sensible advantage accrue from a steady, and properly regulated application of this remedy, after a trial of a week or ten days, in paralytic affections, especially where the brain is operated upon, its use ought to be laid aside. 6. When the pulse has become quicker and firmer, the local, as well as general temperature of the body increased, the feelings, both mental and corporeal, somewhat enlivened, and the altered secretions better regulated, it is proper to infer from such indications, that galvanism may be persisted in with a fair prospect of ultimate success. 7. Where both sensibility and irritability are so greatly exhausted, as not to render the patient susceptible of the galvanic stimulus by the ordinary means; or where, from the unusual thickness of the cuticle, it forms a barrier to the transmission of the fluid, it will be necessary to excoriate the surface by blistering ointment, and apply the metallic points to the raw skin; but the pain and agitation frequently induced, by administering the remedy, through so sensible a medium, must be

guarded against, by adapting the number of plates to the increased degree of sensibility. Dr. Bardsley states, that the galvanic stimulus is an efficacious, though not a certain remedy in paralytic affections; and he is inclined to think, that in all cases which appear to originate solely from a diminished excitement in the sensorium, galvanism is to be preferred to electricity.

Mr. Partington, whose opportunities of observing the effects of electricity, and of galvanism, are very great, informs me, that his experience induces him to trust rather to the former of these powers than to the latter. He thinks, that electricity is more efficacious, and more safe, than galvanism, especially in its application to the head and neighbouring parts. He is willing, however, to allow that advantage may occasionally arise from the employment of both these powers.

In some cases of obstinate palsy, the actual cautery, we are told, has been successfully employed. Prosper Alpinus says, that the Egyptians prescribed it with great advantage in apoplexy, palsy, and epilepsy. And we have an account illustrative of the

curative effects of the application of burning moxa in a case of general palsy, by Dr. Lafosse, in the Athenée de Médecine. In this case, the most powerful tonics had been administered without any benefit; when, despairing of success from the employment of internal remedies, M. Dupuytren advised the application of burning moxa upon each side of the vertebral column, near the first and second dorsal vertebræ. This was attended with immediate advantage. The sloughing of the escars produced by the moxa was hastened in order immediately to establish a drain from the wounds. Under this treatment the patient rapidly amended, and was, in a short time, restored to perfect health. Might not a discharge from the spine, produced by other means, have been equally successful in this case? Was not the application of the moxa preferred on account of the quickness of its operation?

In those cases of hemiplegia, for which stimulants are thought useful, a great variety of internal medicines are recommended, in addition to the external means above mentioned, such as acrid vegetable

and animal substances, volatile salts, essential and distilled oils, resins and gum-resins, &c. Among the principal vegetable substances prescribed as stimulants in palsy, we may reckon the rhus toxicodendron, or poison oak, the nux vomica, the root of horse-radish, and the seeds of mustard.

The leaves of the rhus toxicodendron have, in many instances, been given in hemiplegia with advantage, and in some with complete success. Dr. Alderson of Hull has published an account of the use of this remedy in palsy, as employed by himself and several of his medical friends. This medicine should be used cautiously, as very powerful effects sometimes follow the administration of it, even in small doses. Half a grain of the powdered leaf may be given three times a-day, and the quantity of it may be increased to two, three, four, or five grains, carefully watching its effects. Some practitioners have exhibited this medicine in much larger doses. A very common effect of it, even in small quantity, is a twitching or convulsive motion, or a sense of tingling or

pricking in the paralytic part; and in these cases its efficacy is most conspicuous. Dr. Alderson, in a case of paralysis of one side, with impaired recollection, found that, on the second day after the exhibition of this remedy, the patient was affected with a sudden convulsive twitching, or involuntary motion in certain muscles of the affected side; and that, immediately afterwards, those muscles became obedient to the will. On every succeeding day he felt some muscle or other convulsively moved; and it was always remarked that he possessed the power of voluntarily employing all those muscles that had been once convulsively affected in consequence of the toxicodendron. He regularly continued the medicine, and gradually increased it to one grain every four hours, taking care always to add to the dose, till he found that some convulsive action was produced. In the course of three weeks, in which time every muscle that had been affected with palsy had felt the influence of this powerful drug, the patient regained the free and perfect motion of his leg and arm, and recovered the full

enjoyment of his mental faculties.* The cases adduced by Dr. Alderson, illustrating the good effects of the employment of the rhus toxicodendron in hemiplegia, are very striking, and afford encouragement to a trial of it in those cases of palsy where the employment of stimulants is indicated.

Of late years the nux vomica, a medicine a good deal resembling the rhus toxicodendron in its effects on the constitution, has been tried in palsy. The nux vomica has been very generally considered as poisonous; but in small quantities it may be taken with safety and advantage. Dr. Fouquier, one of the physicians of the Hopital de la Charité, at Paris, has published several cases of palsy, in which he tried this remedy with very great success. M. Fouquier was in the habit of giving it in the form of powder and extract, beginning with small doses, and gradually encreasing them as far as fifty grains in a day. In a short time after it has been taken, spasmodic contractions of the muscles, he

* Alderson, p. 23.

says, in a greater or less degree, or more or less general, are produced. Among the unpleasant effects of the nux vomica, especially in large doses, delirium, a sense of heat and oppression, and anxiety, may also be mentioned. Sometimes general tetanus, with loss of speech and the power of deglutition, accompanied with difficulty of respiration, pulsation of the heart, and dysuria, have been experienced; whilst the good effects of this remedy are manifested by a gradual return of power in the paralytic parts. For a full account of Dr. Fouquier's facts and reasoning in favour of the employment of the nux vomica in palsy, I refer to his publication.

Dr. Dickson, of Clifton, in a communication with which he has favoured me on this subject, relates two cases, in which he had tried the nux vomica in hemiplegia with some advantage. The first patient for whom he prescribed this medicine, was a man 44 years of age, of a robust, full habit, who had been affected with hemiplegia for about ten weeks. "The arm in this case," says Dr. Dickson, "was perfectly useless, and the fingers remained

constantly bent, and could not be extended without great difficulty and pain. He could neither protrude nor bear his weight upon the limb, which was dragged after him, or lifted on his being moved. Having tried various other remedies, he commenced with taking two grains of the extract of nux vomica, in a pill, night and morning, and after having taken six pills, he complained of startings in the affected limb. His toes were extended, and spread asunder occasionally, while in bed, and he could move them, which he could not do before. In about a week he thought himself, and appeared to be, considerably better, and the dose of the extract was increased to four grains night and morning." Although this medicine was at first beneficial, its use was attended with convulsions, which at length became so distressing, that after two months it was relinquished.

The other case in which Dr. Dickson exhibited the nux vomica, was hemiplegia of long standing, chiefly affecting the left arm and side. The patient was about 44 years of age, of a very spare habit, and

nearly fatuous. He began with two grains of the extract, which were increased to five grains twice a-day; but Dr. Dickson, finding that the medicine was sometimes forgotten, and at others given in a double dose, contrary to his positive injunction, durst not venture to push so active a remedy any further. He observes, however, that under even this irregular use, the patient could raise the arm from a horizontal elevation as high as his head, and could open and shut his hand, and grasp a knife, which he was before incapable of doing.

Mr. Rose, of Swaffham, Norfolk, has published two cases of hemiplegia, in which the nux vomica was given in very large doses, and with very powerful effects on the constitution, and I here introduce an account of one of them, rather with a view to illustrate the power of the medicine, and the quantity in which it may be given, than in recommendation of it, for Mr. Rose very candidly allows, that "in the first of these cases effects were produced, some beneficial, and others which could not be renewed with impunity; whilst, in the latter, effects, powerful, but neither

useful nor prejudicial, were produced." The nux vomica was prescribed on the 28th of March, 1818, in the quantity of three grains in powder three times a-day; and from that time the dose was increased every forty-eight hours, until the 4th of April, when the patient took fifteen grains of the powder for a dose. "When taking the ten-grain doses, slight twitchings of the extremities were produced, and a sensation was felt, as if some fluid was running down the interior of the affected arm." The quantity of the medicine was still increased, so that on the 12th of April, a scruple of it was taken three times a-day; and on the 17th, Mr. Rose reports, "there has been a rapid improvement in the paralyzed arm, for on this day he gets his hand nearly to his mouth, and bends the fore-arm a little upon the arm; he can also grasp any thing placed in his hand."* On the 18th, twenty-six grains of the powder were exhibited three times a-day, which seem to have produced very violent effects. "I learnt that on the 24th," says Mr. Rose, "his head

* London Medical Repository, vol. xi. p. 3, 4.

was very much affected with vertigo, from the medicine, and so much spasm produced in his lower extremities, that he could not walk alone; his wife having led him to the door, and left him standing, a tetanic spasm attacked him, and he fell to the ground backwards." * Having omitted to take the medicine for a fortnight, he had, during that time, no tetanic symptoms, and the power of the affected muscles increased. On taking the nux vomica again, he had, after some time, a return of the faintness, flutterings, and palpitation of the heart, and the powders were discontinued. On the 14th of July, Mr. Rose reports, that "he was pretty well recovered from his late disagreeable feelings; his pulse was again very good; and the power of action continued to be restored to the paralyzed members. As the dose of the drug could not be increased, without producing effects of too serious an aspect; and having seen that during a discontinuance of its use he had continued to improve, I laid it aside."

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* London Medical Repository, vol. xi. p. 4, 5.

On the 3d of November, the patient called on Mr. Rose, to say, that he continued to improve both in strength and freedom of action, and that he expected to be able to go to day-labour again in the spring. In the second case in which Mr. Rose prescribed the nux vomica for palsy, no good effect was produced.

M. Fouquier, in a communication to Mr. Rose, speaks of the nux vomica in palsy in very strong terms of commendation; and with respect to the form of administering the medicine, observes, that since the specific effects of the nux vomica have been known to him, he has preferred the alcoholic extract in the form of pills, both to the aqueous extract and to the substance in powder; that the effects of the former are more powerful than those of either of the other preparations; and that he begins with one grain twice a day, gradually increasing the dose. He goes on to describe the particular effects of the remedy, which are such as are noticed in the preceding cases. He then says, if too large a dose is given, its effects discover themselves on the healthy members: to obtain a cure, it must be ad-

ministered for a considerable time; and the dose must be so regulated that sensible effects may be daily produced by it. *

Dr. Granville, in a communication to the editors of the London Medical Repository says, "As a collection of well-authenticated cases, corroborating what has hitherto been advanced respecting the medical properties of the nux vomica, must be a desirable circumstance for the profession in general on your side of the water, I shall begin this letter by informing you, that Professor Dumeril has had occasion to administer the remedy in question to a woman aged about forty, affected by a complete paralysis of the lower extremities; and in whom all sort of motion of the diseased parts had been found impracticable. The effects he has obtained from this medicine have been most satisfactory; and the patient is now able to get out of her bed without any assistance, and likewise to stand a short time on her legs without tottering: he is, at this moment, giving her five grains of

* Lond. Med. Repository, vol. xi. p. 11.

the alcoholic extract, which seems to excite so much internal action, particularly by promoting a considerable sensation of heat in the spine, that the patient has requested the dose might not be increased further. It is well to observe, that she had been trying every sort of medicines before with no effect. At the same time I must not conceal, that a similar experiment, tried on the relative of an eminent chemist, my intimate friend, even for a long period, has completely failed in procuring him, even the slightest relief." *

Since Dr. Fouquier's publication recommending the employment of the nux vomica in palsy, several cases have occurred to different practitioners, in which it has appeared to be highly useful in that disease. The following is a short abstract of some of these cases. The nux vomica was given to the extent of from four to twenty-four grains of the powder daily, to a man fifty-two years of age, an habitual drunkard, who had for four months laboured under an he-

* Lond. Med. Repository, vol. viii. p. 164, 165.

miplegia after apoplexy; and at the end of a month from the time when he began to take the medicine, he was entirely cured. *

A man thirty-six years of age, who, from a fit of terror, had become epileptic for twelve years, was from a similar cause affected with paraplegia for four years. After a trial of various medicines, he had recourse to the nux vomica; and, having taken it in the dose of from two to five grains of the extract, for three weeks he had an attack of tetanus, which continued for four hours, and was followed by a considerable alleviation of the symptoms of his original diseases; from which, by perseverance in the use of the medicine, he wholly and permanently recovered. A female, who had become affected with general paralysis of the limbs, incontinence of urine, and amaurosis, subsequently to the cessation of the menses, took the nux vomica, to the extent of from two to twelve grains of the extract daily, for two months, during which time she had

* Finot. Journ. Univers. des Sciences Med. tom. xi.

two attacks of tetanus, which seemed to be attributable to the medicine. At the end of the two months, the palsy was wholly removed.*

A boy, in the thirteenth year of his age, became affected with a slight degree of numbness in the lower limbs, without any evident cause, which was followed by a painful swelling of the parts; which, however, disappeared in twenty-four hours. The powers of sense and motion in these parts gradually declined, until the patient was hardly able to walk, even when supported by both his arms. The nux vomica was prescribed in powder, in doses gradually increased from two to twelve grains. On the third day the limbs became affected with spasms, and the power of motion was in some degree restored; and on the tenth day the cure was complete. †

Since the first publication of this treatise,

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* Related by M. Lescure, Journ. Univers. des Scienc. Med. tom. xiii.

† Related by M. Finot, Journ. Univers. des Scienc. Med. tom. xi.

I have tried the nux vomica in palsy, both in large and in long-continued small doses. In some instances it seemed to have been useful, in others it produced very little effect of any kind. In one case the convulsive motions, above mentioned, were in a very great degree excited, and the patient appeared to have been debilitated by them. On the whole, this medicine has not answered the expectations I had been led to entertain of its efficacy in the cure or relief of palsy. It is right, however, for me to mention, that I did not give the nux vomica in the form recommended by Mr. Fouquier.

The arnica montana, or leopard's bane, is highly spoken of by some foreign physicians in the cure of palsy. It is given in the dose of from five to ten grains in powder, or an ounce and a half in infusion. Of the advantages derived from the use of this medicine, in paralytic and other affections depending upon an interruption or diminution of nervous energy, we have several proofs; and it is observed, in these cases, that the recovery is generally pre-

ceded by great uneasiness, or acute pain in the parts affected.*

The virtues of arnica in palsy have been extolled by Junkerus, Eschenbach, Colin, Plenck, and others. They gave it generally in infusion of a drachm to half an ounce of the flowers in a pint of boiling water. This preparation, according to its dose, proved emetic, sudorific, or diuretic. It produced in paralytic parts sometimes a sense of formication, sometimes of lancinating or burning pains. †

The root of horse-radish, and the seeds of mustard, have been very commonly prescribed in hemiplegia; and I have, in some instances, seen them useful. They are generally ordered in the form of decoction or infusion; but some think that they may be most advantageously taken in substance, in large doses. Many other vegetable stimulants have been recommended; but I do not find any accounts of their use worth recording.

One of the most powerful stimulants

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* Woodville, Med. Bot. vol. i. p. 11.

† Murray.

which have been employed in these cases is cantharides; which may be taken in tincture, or in substance, in small doses, with safety, and, I believe, with advantage. We are informed that cantharides in substance, in the dose of one grain, conjoined with a scruple of volatile salt, and gradually increased to two grains of the former and forty grains of the latter, every three or four hours, and also cantharides and volatile salts in smaller doses, with guaiacum, have, in some cases of hemiplegia, produced very beneficial effects.* I think I have seen cantharides useful in several cases of palsy; but it is a medicine which should be administered with great caution, as in some constitutions it produces sudden and violent effects on the urinary organs. It should therefore be given in small doses at first, and with mucilaginous diluents.

These are the principal stimulants which have been prescribed in this species of palsy; but a great variety of others have been re-

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* Medical Comment. vol. xiii. p. 96. — Mem. Med. Soc. vol. i.

commended, particularly æther, camphor, lavender, valerian, castor, and other medicines called nervine; but I cannot, from experience, speak of their use, nor do I find in authors any accounts which appear to me to be in favour of the employment of them. The ancients were in the habit of giving some of the above-mentioned medicines, and also asafœtida, cardamoms, onions, sagapenum, and sago; and Pliny informs us, that persons who were in the daily habit of eating the fruit of the caper were not liable to palsy.

Some physicians are of opinion that anodyne medicines, especially opium, are better suited to the cure of hemiplegia than stimulants; that the former relieve, whilst the latter irritate the system, and increase the disease. We are told that opium may be given with safety in all cases of palsy, and that certain appearances which may be considered as against its employment are fallacious.*

In cases of hemiplegia accompanied with

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* Heberden, Falconer, Kirkland.

convulsions or restlessness, I believe opium may be safely and usefully employed.

In the treatment of *paraplegia* particular attention ought to be paid to its cause. When the disease arises from a morbid affection of the spine and the parts immediately connected with it, the excitement of a large discharge of matter from underneath the adipose membrane on each side of the diseased part, has, in many instances, proved successful. Such a discharge, made and continued from the distempered part, checks the further progress of the caries, and gives nature an opportunity of exerting her own powers. It is a matter of very little importance towards the cure, by what means the discharge is procured, provided it be large, that it come from a sufficient depth, and that it be continued for a sufficient length of time.* Mr. Pott tried the different means of setons, issues by incision, and issues by caustic, and found the last, in general, preferable; being least painful, most cleanly, most manageable, and capable

* Pott, p. 33.

of being longest continued. The caustics should be applied on each side of the curvature, in such a manner as to leave the portion of skin covering the spinal processes of the affected bones entire and unhurt, and so large, that the sores upon the separation of the eschars, may easily hold each three or four peas in cases of the smallest curvature; but, in large curves, at least as many more. These issues should not only be kept open, but the discharge from them should be maintained by means of orange peas, cantharides in fine powder, ærugo æris, or any such application as may best serve the intended purpose, which should be that of a large, and a long-continued drain.

Mr. Pott, with that candour which marks a superior mind, acknowledges that this practice was suggested to him by an observation of Dr. Cameron, of Worcester; who, having noted a passage in Hippocrates, in which he speaks of a paralysis of the lower limbs cured by an abscess in the back, had endeavoured, in a case of paralysis from diseased spine, to imitate this act of nature, by exciting a purulent discharge

near the part affected, with a very beneficial effect.

The success of the above-mentioned treatment of this disease has been confirmed by so many trials, that it has become the common and established practice. Mr. Copeland, however, remarks, that the confidence of practitioners in the use of caustic issues has gradually been shaken by repeated disappointments. M. Camper, many years ago, published his doubts of the propriety of this practice; and, recently, Dr. Armstrong and Mr. Baynton have more strongly expressed their disapprobation of these issues.*

Dr. Harrison likewise differs in opinion from Mr. Pott, in several particulars respecting the treatment of paraplegia. In attempting the cure of this disease, Dr. Harrison's great object is to restore the back to its natural figure. "Mr. Pott, believing, as he did, that the mischief always began in the bodies of the vertebræ, confined his efforts to the prevention of ulcer-

* Copeland, p. 29.

ation, to cure it when present, and to join the bones permanently together in the curved form by an immovable union. The practice of Mr. Pott arose by an obvious deduction from his own premises. His object was to excite inflammatory action by caustic issues, and thereby induce anchylosis, or an union among the morbid bones. "That such treatment," says Dr. Harrison, "is useful at an advanced period, after caries is actually formed, may be agreeable to sound practice, though it has never obtained the universal approbation of medical men. At an early period, while the disorder is confined to ligament alone, the practice of Mr. Pott is highly objectionable, because it prevents the application of other modes better calculated to restore the sufferer to his natural figure and former health." — Dr. Harrison does not mean to deny, nor wish to insinuate, that patients have not got well on this plan. "Caustics," he observes, "by stimulating, encourage the muscles and ligaments to act more energetically, by which they sooner regain their lost tone and vigour. The curative process is further expedited by the rest to

which invalids must, to a certain degree, submit while smarting under the pain of caustics. In many cases, Mr. Pott found it necessary to confine his patients to bed, or to a horizontal situation during the greatest part of the cure. In all these recoveries, the subjects of them remain through life in puny health; because the bones continuing displaced, and some of the viscera being necessarily subjected to injurious pressure, the important functions of the spinal cord are imperfectly discharged, owing to the difficulties it meets with from the altered form and direction of the medullary canal."

According to Dr. Harrison's view of the subject, "the obvious indication for the cure of spinal affections consists in restoring the displaced bones to their natural situations, that the spinal cord and its nerves, relieved from injurious pressure and disturbance, may be reinstated in their former abilities. In all the cases hitherto treated agreeably to these principles, the success has been complete. The affected organs to which they run, being no longer under the influence of diseased nerves, gradually re-

cover their healthy state and proper functions."

Mr. Baynton has proposed a new mode of treatment in this complaint. "It consists in placing the patient horizontally upon a firm and unyielding mattress, where he is to remain constantly recumbent during the whole process. He is not accommodated with a pillow to support the head, nor is he to be moved in the least for the most necessary occasions." All fears for the health suffering under this mode, we are informed, have been happily removed by the successful issue of several trials. Mr. Baynton gives an account of his practice in twelve spinal cases. "Of these, one died, and eleven recovered and regained the use of their limbs. The process took up from seven to fifteen months, and the projection was reduced in every instance." Mr. Baynton imputes the want of success where his treatment failed to previous anchylosis of the displaced bones. — For some observations by Dr. Harrison upon this treatment, see the forty-fifth volume of the London Medical and Physical Journal; and for an analysis of Mr. Baynton's twelve cases,

with remarks by Mr. Earle, see the eleventh volume of the Edinburgh Medical and Surgical Journal.

In cases of paraplegia from diseased spine in scrofulous habits, I am of opinion that considerable advantage has in many cases been derived from a proper attention to air, exercise, diet, friction, sea-bathing, mercury in alterative doses, and certain tonic medicines, especially the bark.

In the paraplegia depending upon a morbid state of the brain, the general plan recommended in hemiplegia may be adopted. Dr. Baillie does not know, he says, any very successful method of treating this disease. That which he has employed with the greatest advantage, consists in taking away blood by cupping from the nape of the neck; in the application of leeches to the temples; in applying a blister to the nape of the neck; and in inserting a seton there. The internal remedies which he has used with most advantage are calomel, or the pilula hydrargyri, combined with squills, together with purgative medicines. A grain of calomel, or five grains of the pilula hydrargyri with

one grain of dried squills, have been directed to be taken every night for many weeks. The purgative medicines have consisted chiefly of neutral salts, and sometimes of pills composed of the extractum colocynthidis compositum, with an addition of jalap. He has, in a few instances, found considerable advantage from the lower limbs being rubbed with the hand for an hour twice a-day. In one case he found that a good deal of benefit was derived from electric sparks drawn from the lower limbs. From tepid bathing, both in fresh and sea water, he believes that considerable advantage has been derived in some cases of paraplegia; but he has not, from his own experience, found either of them useful. *

In attempting the cure of *partial palsies*, our practice must be regulated by a careful consideration of the seat and particular symptoms of the disease, as well as of its cause. I shall first treat of the paralytic affections of the organs of sense; among which, none are more common, or more

* Medical Transactions, vol. vi. p. 24—26.

difficult of cure, than nervous blindness and deafness; the former called amaurosis, or gutta serena; the latter, dysecoea, or cophosis.

Amaurosis consists in an immoveable state of the iris, attended with blindness in a greater or less degree, immediately depending upon a defect or abolition of sensation in the retina. In these cases the pupil of the eye is generally more or less dilated; sometimes, however, it is preternaturally contracted. In many cases of this blindness, a contraction of the pupil has been observed to be the only change that takes place in the appearance of the eye. In cases of the latter description the obstruction in the sight is usually preceded by severe pains. * Amaurosis often comes on very gradually, and before blindness actually takes place, the sight seems obscured by the appearance of substances of various colours and shapes floating in the air, or by a mist or cloud covering the object looked at. In amaurosis, generally, both the eyes

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* Ware, Observations relative to the Eye, vol. ii. p. 434.

are affected, but sometimes only one. Mr. Ware mentions the case of a lady, sixty-three years of age, who, after having lost the sight of the left eye for twenty years, was suddenly affected with an appearance like black lace hanging before the right eye and confusing every object at which she looked. Mr. Blagden, of Petworth, in the fourth volume of Medical Facts and Observations, relates the case of a gentleman attacked with this disease, in whom the pupils of both eyes were contracted to as great a degree as the pupil of a sound eye is by a sudden and strong light.

The remote causes of amaurosis are various. It may be produced by pressure on the optic nerves; by tumours, &c. in the brain; by a diseased state of these nerves themselves; by injuries done to the head; by exposure to the rays of the sun; or by a stroke of lightning. It is frequently the consequence of severe inflammation of the eye; or symptomatic of apoplexy, epilepsy, scrofula, or lues venerea. Sometimes no adequate cause can be assigned.

In the treatment of amaurosis, the remedies on which the greatest dependence has

been placed are emetics, cathartics, blisters, issues and setons, stimulating collyria, electricity, errhines, mercury, tonics, and in some cases bleeding. When this palsy depends on any other disease, its cure must be attempted by an endeavour to remove that disease.

Ætius and other ancient Greek physicians recommend bleeding, especially topical bleeding, with a view to remove this affection; and Mr. Ware thinks that, in some cases, where there is much pain in the head, topical blood-letting may prove useful. He mentions instances, however, of amaurosis from other causes, in which an evacuation of blood had been tried without any advantage.

For the cure of amaurosis, Professor Richter, of Gottingen, employed emetics and cathartics, and, as he informs us, with very great success, even in cases of long standing. Tartarised antimony was given in very large doses as an emetic; and his favourite cathartic was soluble tartar. "I have lately restored the sight," he says, "to several patients who laboured under a gutta serena. In all these cases, the cause

of the gutta serena seemed to be seated in the abdominal viscera; for I cured them all by means of medicines, which dissolve obstructions in the viscera, and evacuate.* The tartarised antimony was given in doses of eight and ten grains, but without occasioning any very violent effects. Speaking of a particular patient, he says, "ten grains of tartar emetic made him vomit four times; and again, eight grains of tartar emetic occasioned bilious vomiting three times, and four stools." † Professor Richter seems to place great dependence on certain pills, containing a small proportion of tartarised antimony. ‡ Of these pills he ordered from twenty-four to thirty-two, three times a-day. With these pills, he

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* Richter, Med. and Surg. Observ. translated by Spence, p. 254.

† Richter, p. 257. and 258.

‡ ℞ Gumm. ammoniaci.
Assæ fœtidæ.
Saponis venetæ.
Rad. valerianæ.
Summit. arnicæ, ana ʒij.
Tartari emetici, gr. xviij. ft. pil. pond. gran. ij.

affirms, that he had restored the sight to patients, in whom the first beginning of amendment did not appear, till after using them for six weeks; and the complete restoration of sight was only accomplished by the continued use of these pills for four months. * Mr. Ware has described a case of amaurosis, in which the repeated employment of emetics was attended with the happiest effects.

Blisters, issues, and setons are very generally, and I believe, usefully, employed in this affection. When amaurosis proceeds from a paralytic affection of the retina, blisters, we are informed, applied to the fore-part of the head, so as to cover the nerves which issue through the supra orbital foramina, and spread themselves on the forehead, are highly serviceable. † Stimulating collyria have been often tried in these cases; but I find no accounts of their efficacy, that would lead me to expect much advantage from the employment of

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* Richter, p. 259.

† Percival, Essays Medical and Experimental, 209, 210.

them. The remedy on which I would most rely, in attempting the cure of this disease, is electricity. Mr. Ware places great confidence in electricity for the alleviation or removal of this affection, and particularly describes four cases under his care, in which a cure was perfected by it; and he thinks that in many instances, when it has not been successful, the failure might rather be attributed to an injudicious use of it, than to its want of efficacy.* In the application of electricity to so delicate an organ as the eye, its mildest form is to be preferred, namely, that by stream, by means of a pointed conductor; and the electric aura should not be applied for a longer time than about ten minutes, or a quarter of an hour. Shocks, and even sparks, too powerfully stimulate, and may do injury.

Mr. Partington recommends a cautious application of electricity in nervous blindness. He has favoured me with an account of a case, in which he employed that

* Ware on the Eye, p. 425.

power in amaurosis with the best effects. In this instance, he administered the electric fluid, by means of a wooden point, to the eyes themselves, and by an electric brush to the eye-lids.

The success of this practice, which, at different periods, was employed for two months, was very great; the pupils of the eye, to use the patient's own expression, being made to dilate and contract as much as they ought to do.

In the third volume of the American Journal of Science, a case is mentioned of a paralytic affection of the eyes, which was cured by a stroke of lightning during a violent thunder storm, by which the patient was thrown to the ground. The particular nature and symptoms of this palsy are not described.

In the cure of amaurosis, errhines have been recommended. In several cases, considerable relief has been obtained by the use of a snuff, compounded of ten grains of turbith mineral, well mixed with about a drachm of the pulvis sternutatorius of the London Pharmacopœia, or of glycyrrhiza, or saccharum commune. A small

pinch of this snuff, taken up the nose, is found to stimulate it very considerably; sometimes exciting sneezing, but, in general, producing a very large discharge of mucus. *

Errhines sometimes produce a bleeding from the nose, which has been thought useful in these cases. Mr. Ware mentions instances of this effect attended with advantage; and Mr. Blagden, of Petworth, has published, in the fourth volume of Medical Facts and Observations, a case of amaurosis cured by a snuff, consisting of five grains of hydrargyrus vitriolatus, and thirty-five of the pulvis asari compositus. This snuff occasioned the patient's nose to bleed freely; and Mr. Blagden observed that the use of the remedy was in proportion to this effect. With respect to the more acrid errhines, such as the root of hellebore, euphorbium, &c., great caution is recommended, as they may ulcerate the membranous lining of the nose, and occa-

* Ware, 435, 436.

sion incessant sneezing, threatening convulsions. *

In some instances mercury, given in small alterative doses, has been found highly beneficial in the treatment of this disease. Mr. Ware strongly recommends, in preference to all external applications whatever, the internal use of the oxymuriate of mercury, of which he orders a quarter of a grain for a dose, dissolved in brandy, and taken in sago, or water-gruel. †

In addition to these remedies, in the treatment of amaurosis, some practitioners recommend a great variety of those which are called nervine and tonic.

Mr. Travers thinks that the treatment of amaurosis should be almost exclusively constitutional. He places no confidence in external applications, such as stimulant vapours, drops, and ointments; spirituous and aromatic embrocations, sternutatories, &c. He makes an exception, however, in favour of cupping, issues, or setons, in cer-

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* Van Swieten, § 1068. † Ware, p. 435.

tain cases, and of blisters in almost all. He never witnessed any advantage in this disorder from the employment of electricity or galvanism; he has not known any real benefit from what are called antispasmodic and anti-nervous medicines; nor from the exhibition of emetics, though, from respect to authority, he has fairly tried them in many instances.

In most cases of amaurosis, Mr. Travers depends on the regulation of the visceral functions, and the employment of such restoratives as the system requires, and can bear. The blue pill, with colocynth, rhubarb, and aloes, and the combination of soda with rhubarb and calumba or gentian, are best adapted, he thinks, to the former purpose. The exhibition of general tonics, he says, is often indicated; and he has seen much benefit from the mineral acids, bark, steel, and arsenic when admissible, after a due regulation of the digestive functions. In recent and sudden amaurosis, Mr. Travers recommends a mild administration of mercury, but salivation, he thinks, is always hurtful; and he is of opinion, that "all cases of direct debility, and proper paralysis

of the retina, are aggravated by the loss of blood." *

In the treatment of this complaint, Dr. Vetch is a warm advocate for the practice of blood-letting. He observes, that in cases of amaurosis, where the usual symptoms of inflammation are least of all observable, the necessity of relieving the vessels of the part will often be the most urgent; and, although a few ounces of blood taken from the temples may subdue any outward appearance of congestion, or arterial action, which has taken place in consequence of pressure, the evacuation must be carried to the full extent of producing syncope, in order to make such an impression on the congestive state of the deep-seated vessels as will enable them to recover their power of contraction. The effects of this depletion are to be assisted by the usual means of lessening the quantity of blood sent to the part. Leeches applied to the septum nasi are found to be more effectual than any other mode of employing them.

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* Travers's Synop. p. 300.

In the treatment of amaurosis, Dr. Vetch also mentions the employment of purgatives; antimonial emetics; pediluvium; seclusion from light; cold applications to the eyes; blisters and rubefacients to the neck and behind the ears; sinapisms to the feet and legs; and the reproduction of any habitual discharge, or cutaneous disorder: but he has not expressly stated his opinion concerning the particular uses of these various means, or the advantages to be expected from them. *

A paralytic affection of the auditory nerves does not often, I believe, occur. Deafness more frequently depends on other causes, such as an obstruction of the Eustachian tube, wounds, ulcers, or whatever mechanically impedes the functions of the ear. For the cure of deafness, a great variety of topical remedies have been recommended, such as oils, spirits, preparations of lavender, musk, and other nervines; but I doubt much of the efficacy and even safety of these applications, to

* Vetch's Treatise on Disorders of the Eyes.

an organ of so much delicacy as the ear. When we have reason to believe that deafness depends upon palsy, blisters behind the ears, or issues, or setons to the neck, together with electricity or galvanism, may be tried, perhaps, with advantage. Dr. Priestley, in his History of Electricity, mentions a case, in which a woman was cured by it, who had laboured under a deafness for seventeen years. *

As electricity and galvanism are chiefly recommended in those cases of deafness which depend upon palsy, it is of consequence to distinguish such cases from deafness depending on other causes. In order to ascertain whether or not deafness depends upon a paralytic state of the auditory nerves, we are directed to place a watch between the teeth, so as to rest upon them. If the beating of the watch, thus placed, cannot be heard, we may conclude the disease to be palsy. Deafness often depends upon an obstruction of the Eustachian tube, in which case relief may be obtained by an operation. For a particular

* Priestley, p. 415.

account of the method of judging whether in deafness this tube be closed or open, see Sir Astley Cooper's excellent paper in the Philosophical Transactions, for 1801.

Paralytic affections of the olfactory and gustatory nerves, called *anosmia* and *ageustia*, do not, I believe, often occur. With respect to the treatment of these diseases, I have nothing material to communicate, either from authors, or from my own experience. A want of the power of smelling, or of tasting, more frequently depends upon organic disease than on palsy, and it is only with paralytic affections that we are at present engaged. When these complaints are symptomatic of fevers, &c., it is evident that we must endeavour to remove them by means suited to the removal of the disease, of which they are symptomatic. In anosmia mild errhines, and in ageustia the chewing of the roots of pellitory of Spain, horse-radish, or other stimulating substances have been recommended.

After this account of the partial palsies which consist in a *loss of sensation*, I proceed to the consideration of those which consist in a *loss of motion*. Among these,

the first that occurs in the order of Dr. Young, is the want of motion from the effects of lead, or other noxious mineral substances, denominated by Dr. Cullen, *paralysis venenata.* This palsy is generally, but not always, accompanied with colic.

Although lead may produce its deleterious effects in any part, it chiefly attacks the hands and wrists, greatly impairing their motion, without much diminishing their sensation.

For the alleviation or cure of this complaint, the history of which has been already given, a great variety of remedies, both external and internal, have been recommended, the principal of the former of which, are, friction, warm-bathing, electricity, liniments, and blisters; and of the latter, almost all the stimulants above mentioned in the treatment of hemiplegia, together with bark, bitters, and chalybeates. When the disease is accompanied with colic, the cure is to be attempted by purgatives, particularly castor-oil; by fomentations and liniments, and the warm bath; by opium and other anodynes; by the balsams of Copaiva and Peru; and by a

variety of tonic medicines, for a particular account of which, I refer to treatises on Colica Pictonum, by Sir George Baker, Dr. Clutterbuck, and others.

For the cure of paralysis from lead and other noxious mineral substances, the Bath waters are celebrated, and also those of Bareges and Aix-la-Chapelle. Very beneficial effects are said to have followed the external application, and internal use, of sulphureous waters, in the cases of a number of painters, who, having been employed in the arsenals of the port of Ferrol, became affected with the colica pictonum, attended with paralytic affections of the hands and arms. M. Bosquet, physician-in-chief to the Spanish army, had in so many instances observed the good effects of drinking the sulphureous waters of a spring in a village near Ferrol, and of bathing in them, that he almost entirely trusted to these waters for the cure of that species of colic, and the palsy which accompanied it. *

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* Traité de la Colique Metallique, par M. Merat, p. 201.

M. Segault de Lafond relates the cases of twenty-three paralytic persons cured by electricity, of which several were cases of palsy from lead. Dr. Percival had an opportunity of observing the good effects of electricity in general palsy arising from this cause; but the relief afforded was not permanent. * Galvanism has also been tried, especially by foreign physicians; but without advantage. In the hospital La Charité at Paris, the galvanic power was applied in the case of a painter, who had become paralytic; but the complaint was rather aggravated than relieved by it.

For the cure of palsy of the hands and arms, sometimes with, and sometimes without colic, Dr. Clutterbuck recommends mercury, and relates several cases in which its good effects were evident. He gives this medicine in the form of calomel, and of ointment to be rubbed on the parts affected; and he directs that this plan should be continued till the mouth becomes

* Perciv. Med. Essays.

sore. Dr. Clutterbuck's observations of the good effects of mercury in this disease lead him strongly to recommend it.

In palsy of the hands from lead, we are told that much advantage has been in some cases derived from a flat piece of wood somewhat like a battledore, fastened to the fore-arm, and extended to the ends of the fingers. The muscles are supposed to be thus kept in a favourable position.*

The paralytic affections arising from arsenic, and other mineral poisons, are to be treated in the same manner as those which arise from lead.

The palsy produced by bella donna, and other vegetable narcotics, is, I believe, generally of short duration, either spontaneously ceasing, or disappearing soon after the exhibition of emetics and purgatives.

Among the partial palsies, those of the muscles of speech, and deglutition, and of the muscles of the bladder, are the most frequent; for though we read of paralysis of the heart†, of the muscles of respiration, of

* Pemberton on Diseases of the Abdominal Viscera.

† Boerh. Aph. § 1062.

the stomach and the intestines, they very rarely occur. Palsy of the muscles of speech has been called *aphonia.* These muscles of speech are almost always more or less affected in hemiplegia; but instances sometimes occur of paralytic affections of these parts without any other palsy. We have a case of this kind related in the Edinburgh Medical and Surgical Essays, in which free depletion by bleeding and purging cured the disease. A person of a costive habit of body was suddenly attacked with paralysis of the tongue without any other complaint; when twenty ounces of blood were immediately taken from the arm, and a bolus, consisting of a scruple of the electuary of scammony and six grains of calomel, was administered, and in four hours repeated. An embrocation of equal parts of turpentine and camphorated spirit, was used to the external parts of the throat and neck, every two hours. On the day following, the patient had five or six fœtid, dark-coloured evacuations from the bowels; after which the power of speech, and the perfect motion of the tongue were restored.* In this pa-

* Edin. Med. and Surg. Journal.

ralysis, Forestus advises us to open a vein under the tongue, to apply cupping-glasses under the chin, and acrid liniments and sinapisms to the back of the head and neck; to employ cathartics, and to use stimulants internally and in the form of gargles; and he adduces instances of recovery from the disease by these means. In the case described in page 11. the power of speech was almost entirely restored by galvanism and stimulating gargles, together with mercurials in alterative doses, and purgatives occasionally administered.

Palsy of the muscles of deglutition, denominated *dysphagia*, in some degree very frequently accompanies hemiplegia, and recedes as other symptoms recede; but if these muscles be completely paralysed, the power of swallowing becomes wholly abolished, and food and medicine can only be introduced into the stomach by artificial means. Mr. Hunter, in speaking of dysphagia from paralysis, observes, that he cannot determine whether or not the muscular coat of the œsophagus is ever affected

by it; but he expresses his conviction that the muscles of the pharynx have sometimes become paralytic, and that, in consequence, the patient has died of hunger. He describes a case of this paralysis, in which the subject of it was wholly incapable of swallowing; and in which cupping, blistering the throat, and the application of electricity, had been prescribed, without any benefit. In this instance Mr. Hunter recommended that a hollow, flexible tube, should be passed down into the stomach, by means of which food and medicine might be received. Valerian, in large doses, was thus administered, and laudanum was given both by the mouth, and in the form of clyster. As the laudanum affected the head without procuring sleep, the employment of it was relinquished; but the valerian was continued for about a month, when the patient had evidently recovered a degree of sensation in the throat. Two scruples of flour of mustard, with a drachm of the tincture of valerian, were afterwards given twice a-day; and under this treatment, in a few days, the power of swallowing gradually

returned, and the tube was no longer necessary. For a particular account of the nature and composition of this tube, I refer to the first volume of the Transactions of the Society for promoting medical and surgical knowledge.

Although the diseases called *aphonia* and *dysphagia* have been particularly described by Sauvages and Cullen, I find nothing of much importance respecting the treatment of them in those authors. In the latter complaint, Sauvages recommends the remedies employed in the more general palsies, and the mastication of aromatics, and the radix pyrethri. In both these affections, I have seen good effects from blisters applied to the external fauces, and from stimulating gargles. Perhaps electricity might be found useful under such circumstances.

One of the organs most frequently attacked by paralysis, is the bladder; in which cases, Forestus and others recommend stimulating embrocations to the parts in the neighbourhood of the bladder, and strong cathartics. Forestus thinks that castor is useful in this, and all other

palsies. * In palsy of the bladder, I have, in several instances, seen very good effects from blisters applied to the os sacrum, and tincture of cantharides taken in small doses.

Palsies of particular muscles sometimes depend upon a diseased state of some parts of the brain, or spine; sometimes upon morbid affections of the nerves themselves. In the former cases, we are advised by Galen to make our applications as nearly as possible to the origin of nerves, rather than to the nerves themselves, particularly in palsies of muscles, the nerves of which are derived from the spinal marrow.

In those cases in which the loss of motion of particular parts is accompanied with pain, Mr. Bell advises the application of leeches along the course of the nerves of the part affected, a free administration of cathartics, friction with laudanum, and proper supporting bandages. This plan, with

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* Neque prætermittatur castoreum; habet enim proprietatem mirabilem ut omni paralysi conveniat.
Forestus, lib. x. ob. 92.

the addition of opium and colchicum, internally taken in considerable doses, proved effectual in relieving the distressing case above mentioned under the care of Mr. Bell.

Mr. Pearson has, at considerable length, described some remarkable symptoms, connected with a painful affection of the left thumb; amongst which were a very great diminution of the power of voluntary motion in the brachial muscles, and pain and debility in the lower extremities, with nearly an inability of locomotion. I cannot, consistently with my plan, give an account of the particulars of this interesting case; but must refer to the eighth volume of the Medico Chirurgical Transactions, where they are very minutely detailed. I shall, however, briefly describe the mode of treatment which Mr. Pearson employed with the happiest effects. After having tried, without the smallest advantage, a great variety of means, he was at length induced to attempt the cure of the complaint by inflicting a disease which should extend over a large portion of the surface of the body, and which, after ex-

citing a series of actions in the skin, should finally cause an extensive eruption, attended with the usual concomitants of certain exanthemata. For this purpose, he directed a stimulating liniment *, to be rubbed during ten minutes, twice in the day, over the whole circumference of the upper part of the arm, beginning immediately below the joint of the shoulder, and including a space bounded by the inferior extremity of the deltoid muscle. No local effects upon the skin being perceptible at the end of three days, he added half a drachm more of the sulphuric acid to the composition, and desired that it might be applied three times in the day. In somewhat less than a fortnight, pain and redness appeared in the upper arm; and on using the liniment during the incipient state of inflammation, in the space of little more than an hour, the whole arm, from the shoulder to the hand, was red, heated, tumid, and very painful. These symptoms became gradually more

* ℞ *Ol.* Olivæ ℥ii p.
Terebinth. ℥i p.
Acid. Sulph. ℥j.

intense, and were diffused more extensively, increasing progressively during five days. At this time a number of small vesicles, containing a pellucid fluid, appeared on various parts of the arm; the face became swollen, as in the acute erysipelas, and vesicles were distributed on different parts of its surface. In a few days the heat, redness, tumefaction, and uneasiness of the arm were considerably diminished, and the patient recovered visibly every day. About the fifth day after the appearance of the cutaneous disease, the thumb became agitated by a spontaneous motion, unattended with pain. The thumb and fore-finger of the left hand having now lost their morbid sensibility, became gradually capable of regular voluntary motion; the disease was removed, and the affected arm and hand gradually regained the faculty of performing their customary actions. At the expiration of little more than two months from the application of the rubefacient, all appearance of the disease had vanished. *

* Med. Chirurg. Trans. vol. viii. p. 252.

A disease has been lately described by Mr. Parkinson, under the title *paralysis agitans* or shaking palsy, which appears to me to be highly deserving of our attention; I shall, therefore, here give a short account of it, though nosologists have not classed it among the palsies.

This disease begins with some degree of weakness, and a slight trembling in some particular part, sometimes in the head, but most commonly in one hand and arm. These symptoms gradually increase, and at length some other part becomes similarly affected, generally the other hand and arm. Some time after the appearance of these symptoms, one of the legs is observed slightly to tremble, and is found to suffer fatigue sooner than the leg of the other side; but in a few months this leg also becomes agitated in a similar manner, and experiences a similar loss of power. Under these circumstances the limbs, in walking, cannot be raised to that height, nor with that promptitude which the will directs, and the body is involuntarily thrown forwards, so that the patient is forced to step on his toes and the fore-part of his feet,

and in walking to take short and quick steps, and at length to increase his pace to that of running, to prevent his falling to the ground. * In this stage of the disease, the sleep becomes disturbed by tremulous motions; the limbs are no longer obedient to the will, so that the ordinary offices of life cannot be performed; the bowels become exceedingly torpid, and demand stimulating medicines of great power; the trunk is almost permanently bowed; the weakness greatly increases, and the tremulous agitation becomes very violent; the speech is much impeded; the power of retaining food in the mouth, and of swallowing it, is almost abolished; the saliva trickles from the mouth; the urine and fæces pass away involuntarily; and constant sleepiness with slight delirium supervene, which are soon followed by the death of the patient.

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* The case of Major H——, above described, as an anomalous paraplegia, was so strongly marked by these symptoms, that it might have been more properly placed under the head Paralysis agitans.

Mr. Parkinson conjectures that a diseased state of the medulla spinalis, in that part which is contained in the canal formed by the superior cervical vertebræ, and extending as the disease proceeds to the medulla oblongata, is the proximate cause of this disease.

For the cure of paralysis agitans, Mr. Parkinson recommends that blood should be taken from the upper part of the neck, after which vesicatories should be applied to the same part, and a purulent discharge obtained by the use of the sabine liniment. If a sufficient discharge cannot be obtained by blisters, he directs that large issues should be made on each side of the upper part of the vertebral column, and kept open. On these means, with a proper attention to the state of the bowels, Mr. Parkinson chiefly relies for the alleviation and cure of this disorder.

For a variety of interesting particulars respecting paralysis agitans, I refer to Mr. Parkinson's Treatise.

APPENDIX.

Abstract of Dr. Gordon's Report from the Minutes of the Army Medical Board.

Dr. Gordon does not find that any particular make or conformation of body was observable in those soldiers who were affected with apoplexy and palsy. The chief exciting causes of these disorders were intoxication, exposure to the rays of the sun, drinking cold water, and bathing in cold water, when the body was heated. Dr. Gordon remarks, that apoplexy often followed epilepsy, long-continued fevers, and visceral disease, especially dysentery; and that serous apoplexy sometimes came on after a species of marasmus, denominated *Cachexia Africana;* sometimes after an improper use of mercury; and frequently after blows, and falls from horseback.

The apoplectic seizure, in this climate, chiefly occurs between the ages of thirty and fifty; but in warm climates it takes place without much reference to any particular age, as it arises

chiefly from exposure to the sun, and the abuse of spirituous liquors. The appearances found after death much resemble those which I have at large described.

Dr. Gordon observes, that in the treatment of this disease in the army, the remedies almost wholly relied upon were bleeding, both general and topical, including arteriotomy; the application of blisters, and the administration of cathartic medicines.

Return of Cases of Paralysis and Apoplexy, treated in the Army during the Period of Six Months.

PERIODS.	Strength.	SERVICES.	Treated.		Died.		
			Apoplexia.	Paralysis.	Apoplexia.	Paralysis.	
From 21st Decemb. 1819, To 20th June 1820.	5999	Cavalry (England)	3	4	1	0	
	11865	Infantry (England)	1	5	0	0	
	6190	Veteran battalions (England)	3	4	2	0	
	3958	Fort Pitt Hosp. &c. (England)	1	17	0	0	From Regiments abroad.
From Dec. to June 1819.	7186	Windw. and Leew. Islands	3	1	0	0	
	1758	Mauritius	2	2	0	1	
Mar. to Sept. 1819.	12800	Bombay	8	12	8	1	
Apr. to Oct. 1819.		Bengal	3	5	2	1	
Ditto to ditto, ditto.		Madras	4	1	3	0	

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