

"As regards medical treatment, I may just state that general bleeding is very rarely employed; when it is, the cases are usually apoplectic, and not maniacal. Topical depletion by leeches and cupping is much more frequently resorted to, Dr. Everts stating that the latter would be employed at least once daily. (Number of patients, at the time of Dr. T.'s visit, 391.) Tunod's *ventouse monstre* is also considered of great service in deriving the blood from the spinal cord and cerebrum, and in restoring the catamenia, in hysterical mania. Emetics are occasionally found of use."

In 1851, the average resident number of patients was 297; average attending worship, 114; engaged in work, 190; under restraint, 7.

	Men.	Women.	Total.
The number of epileptics was	25	18	43
Number of fits by day (9 A. M. to 9 P. M.)	1,600	2,415	4,015
" night (9 P. M. to 9 A. M.)	1,372	3,435	4,807

At the Asylum of Utrecht, "during the first thirty years of the century, the mortality, calculated on the admissions, was 35 per cent.; during the last five years, only 17 per cent."

"Dr. Ramaer (of the Asylum at Zutphen) constantly finds a much larger proportion of noisy patients among the women than the men; at present there are nearly twice as many of the former more or less excited. On mentioning this to ———, as a reproach on the gentler sex, she argued that it was natural to suppose women would be *more* noisy than men, when *insane*, because they are so much *less* so when they are *sane*!"

We extract the aggregate statistics of the Dutch asylums for the seven years next preceding December 31, 1850:—

	Men.	Women.	Total.
Patients in the asylums January 1, 1844	424	413	837
Of these, there were cured in the seven years	56	44	100
Died	159	165	324
Number admitted in course of the same years	1,590	1,497	3,087
Of these, there were cured	477	523	1,000
Died	474	327	801
Remaining, of both the above classes, Dec. 31, 1850	619	657	1,276
Average number resident during seven years	608	502	1,110
Mean annual mortality, per cent., resident	15.1	13.9	14.5

In a review of the asylums generally, Dr. T. remarks that it is "evident that they are not yet perfect. A great work of reform, however, has been commenced; and, considering the period of time which has elapsed, I think that the progress made in the amelioration of the condition of the insane is highly satisfactory. One noble institution (Meerenberg) has been reared, of which any country might justly be proud; an institution which, itself the indication and result of the reform in Holland, will in its turn act as the nucleus of an extended improvement in the management of Dutch asylums." P. E.

ART. XXIII.—*Experimental and Clinical Researches on the Physiology and Pathology of the Spinal Cord, and some other parts of the Nervous Centres.* By E. BROWN-SÉQUARD, M. D., of Paris, Professor of the Institutes of Medicine and of Medical Jurisprudence in the Medical College of Virginia, etc. 8vo. pp. 66. Richmond, 1855.

THIS, like all of Dr. Séguard's former contributions to physiology, will be found deeply interesting to the pathologist. In his investigation of an important class of diseases dependent upon lesions of different portions of the nervous centres, the present researches will afford him material aid. The object for which they were undertaken is to determine the place of decussation of the sensitive and voluntary motor nerve-fibres in the cerebro-spinal axis.

This question Dr. Séquard has attempted to solve by a series of vivisections, the correctness of the results derived from these being tested by numerous clinical observations, in which the disturbance of motion or of sensibility during life was carefully compared with the lesions of the nervous centres discovered after death.

The generally received explanation of the fact that an alteration of the brain on one side produces a loss or diminution of sensibility and of voluntary movements on the opposite side of the body, is that the sensitive and motor nerve-fibres proceed to the encephalon along the spinal cord without decussating, but that, when they have arrived at the medulla oblongata, they begin to decussate, and continue to do so along the middle line of what is now termed the *Isthmus of the Encephalon* (medulla oblongata, pons Varolii, crura cerebri, corpora quadrigemina, etc.).

This explanation Dr. S. has endeavoured to show to be entirely erroneous, and to prove that the *sensitive* nerve-fibres decussate almost exclusively in the spinal cord, while the *voluntary motor* nerve-fibres decussate mostly in the inferior portion of the medulla oblongata.

The facts developed by the vivisections performed by Dr. S., in proof of a crossing of action for sensibility in the spinal cord, are as follows:—

“1st. If a lateral half of the spinal cord is divided transversely at the level of the tenth costal vertebra, on a mammal, it is found that sensibility is much diminished, and, in some cases, entirely abolished in the posterior limb opposite to the side of the section. On the contrary, the sensibility, far from being lost, appears to be much increased in the posterior limb of the side where the section has been made.

“2d. If, instead of one transverse half section of the cord, two, three, or more are made on the same side, the same effects are observed.

“3d. If, instead of mere sections, a removal of a lateral half of the spinal marrow is effected, the same results are still observed.

“4th. If the lateral section is not complete, and if the part left undivided is in the neighbourhood of the centre of the cord, it is found that sensibility appears to be increased in the posterior limb of the same side, and that in the other posterior limb there is only a slight diminution of sensibility. If the part left undivided is considerable, sensibility does not appear to be diminished in this last limb, and sometimes it seems rather increased.

“5th. If, in performing the section of a lateral half of the spinal cord, the instrument goes a little too far, and divides also a small portion of the other half in the central part, then the posterior limb on the side of the complete section is less sensitive than in the normal state, and the posterior limb of the opposite side loses completely its sensibility.

“6th. If the section of a lateral half of the spinal cord is made at the level of the second or third cervical vertebra, it is found that sensibility becomes very quickly much greater in the parts of the body on the side of the section, and that, on the contrary, the parts on the other side become evidently less sensitive.

“7th. If, after a section of a lateral half of the spinal cord at the level of the eleventh costal vertebra, we perform the section of the other lateral half at the level of the sixth costal vertebra, so that the two lateral halves of the cord are cut transversely, we find that sensibility is entirely lost, or very nearly so, in the two posterior limbs. Sometimes a very slight degree of sensibility remains, more particularly in the posterior limb on the side where the spinal cord has been divided at the level of the sixth costal vertebra.

“8th. If two sections of lateral halves are made as in the preceding experiment, but at a greater distance from each other; for instance, one on the right side, at the level of the eleventh costal vertebra, and the other on the left side, in the cervical region, nearly the same results are obtained as regards the posterior limbs, but the sensibility is increased in the right anterior limb, and it remains, though much diminished, in the left anterior limb.

“9th. If, after having divided transversely a lateral half of the spinal cord in the neck, at the level of the roots of the second pair of nerves, we lay bare the very sensitive nerves going to the ear, in dogs or rabbits, we find that their sensibility, on the side of the section of the cord, appears increased, and that,

on the contrary, on the other side, they appear either destitute of sensibility or very slightly sensitive.

"10th. Sections of a lateral half of the medulla oblongata give, as regards sensibility, the same results as sections of a lateral half of the spinal cord.

"11th. If a longitudinal section be made on the part of the spinal cord giving nerves to the posterior extremities, so as to divide that part into two lateral halves, then it is found that sensibility is completely lost in the two posterior limbs, although voluntary movements take place in them.

"12th. If a similar separation of the two lateral halves of the spinal cord be made on the whole part supplying nerves to the anterior limbs, then we find sensibility is lost in both these limbs, and that it is only slightly diminished in the posterior limbs.

"13th. If the same operation be made as in the preceding experiment, and if afterwards a transverse division be made on one of the lateral halves of the cord, in the part where the longitudinal section has been performed, then we find that the posterior limb on the side of the transverse section remains sensitive, while the opposite posterior limb loses its sensibility."

In confirmation of the general conclusion drawn from the foregoing experiments, that very nearly all the sensitive nerve-fibres coming from the trunk and limbs cross each other in the spinal cord, and that, in consequence, the transmission of the sensitive impressions made upon one side of the body takes place almost entirely along the opposite side of the spinal cord, Dr. S. adduces a series of pathological facts, in which it is shown that an alteration of one side of the spinal cord is attended by a loss of or deficient sensibility on the opposite side of the body. The first portion of the series comprises cases of partial alterations of a lateral half of the cord, more or less conclusively proving the decussation of sensitive nerve-fibres in that organ. The second portion of the series embraces cases of alteration of one side of the medulla oblongata or of the pons Varolii, which appear to Dr. S. to prove positively the decussation in question.

The next series of vivisections were undertaken to test the influence of a section of a lateral half of the spinal cord, and of the medulla oblongata, upon *voluntary* movements. From these experiments, and a number of pathological facts adduced by Dr. S., he is led to admit one of the four following opinions, each of which, he remarks, appears to be supported by some facts:—

"1st. The decussation of *all* the voluntary motor nerve-fibres takes place in the medulla oblongata, where the fibres of the lateral columns cross each other to form the anterior pyramids.

"2d. The decussation of the voluntary motor-fibres takes place partly in the medulla oblongata, but for a greater part in the pons Varolii, and in front of it.

"3d. The decussation of the voluntary motor-fibres takes place in the medulla oblongata and in the spinal cord.

"4th. The decussation of the voluntary motor-fibres takes place together in the spinal cord, the medulla oblongata, the pons Varolii, and the parts in front of it."

The first of these opinions appears to Dr. S. to be somewhat too exclusive; it is possible, he admits, that some few fibres go up to the pons Varolii, or still higher, to make their decussation, but still there are strong reasons which prevent his admitting that such is positively so. It may be, also, that some fibres decussate in the spinal cord itself, although from pathological cases observed in man this would appear not to be the case. Dr. S. believes that if the crossing of the pyramids do not contain *all* the voluntary motor nerve-fibres of the trunk and limbs, the number of these fibres which do not decussate there is but small.

The general conclusions, therefore, of Dr. Séquard, from the experiments and observations referred to in the publication before us, are as follows:—

"1st. The *sensitive* nerve-fibres of the trunk and limbs appear to make the greatest part of their decussation, if not the whole of it, in the spinal cord, and not in the isthmus of the encephalon, as was generally admitted.

"2d. The *voluntary* motor nerve-fibres of the trunk and limbs appear to make their whole decussation, or, at least, the greatest part of it, in the inferior por-

tion of the medulla oblongata, and not in the other parts of the isthmus of the encephalon, as was before admitted.

"3d. According to the seat of an alteration in the cerebro-spinal axis, producing a paralysis, there are three different kinds of paralytic effects, which may exist.

"a. The alteration being in any part of the encephalon, except the inferior portion of the medulla oblongata, the paralysis of voluntary movement and of sensibility exists in the side of the body opposite to the side of the disease.

"b. The alteration occupying an entire lateral half of the inferior portion of the medulla oblongata, at the level of the decussation of the pyramids, the paralysis of voluntary movement exists on both sides of the body, but is incomplete, and the paralysis of sensibility exists only on one side, and that opposite to the side of the disease.

"c. The alteration occupying the entire thickness of a portion of a lateral half of the spinal cord, the parts of the body situated behind it, on the same side, are paralyzed in their voluntary movements, and the corresponding parts on the other side are paralyzed in their sensibility."

According to the investigations of Dr. S., three different forms of paralysis may be produced by an alteration of a lateral half of the cord, and all characterized by the existence of paralysis of movement on one side of the body, and a more or less extended paralysis of sensibility on both sides of the body.

"1. If an alteration, able to produce paralysis, exists in the whole thickness of a lateral half of the cord, in the entire extent of the part from which come all the nerves going to one of the upper limbs, there will be paralysis both of movement and of sensibility in that limb, and paralysis of movement in the trunk and the inferior limb, in the same side of the body, and besides, paralysis of sensibility in the opposite side of the body—limbs and trunk.

"2. If an alteration, able to produce paralysis, exists in the whole thickness and length of the part of a lateral half of the cord, which gives all the nerves going to one of the inferior limbs, there will be paralysis both of movement and of sensibility in that limb, and only paralysis of sensibility in the opposite limb.

"3. If an alteration, able to produce paralysis, exists in the whole thickness and in the whole length of a lateral half of the cord, the symptoms will be a paralysis of movement in the side of the body corresponding to the side altered in the cord, and a paralysis of sensibility in the two sides of the body—neck, trunk, and the four limbs.

"As the sensitive nerve-fibres, coming from one side of the body, have to pass through the corresponding side of the spinal cord to go to the opposite side of this organ, it is easy to understand that an alteration occupying the entire thickness of the cord is able to produce a paralysis of sensibility, together with a paralysis of movement, in the same side of the body. But it must be remembered that if, in such cases, the paralysis of movement exists in all parts of the body receiving their nerves from the altered part of the cord, and also from all the healthy parts below it—if there are any—the paralysis of sensibility, in the same side, remains limited, almost entirely, to the parts which receive their nerves from the altered portion of the spinal cord."

Dr. S. presents a list of certain pathological and other facts which appear to be opposed to the deductions he has drawn from the facts and reasonings he has presented. These are arranged under the following heads: 1st. Alleged voluntary movement and apparent existence of sensibility in children who are to all appearance deprived of the cerebro-spinal axis. 2d. Alleged voluntary movements and apparent existence of sensibility in parts of the body considered as deprived of their natural connection with the encephalon. 3d. Alleged persistence of sensibility and voluntary movements in men and animals deprived of all parts of the encephalon, except the medulla oblongata and pons varolii. 4th. Cases proving that considerable alterations of the pons varolii and medulla oblongata may exist without producing paralysis either of sensibility or of voluntary movements. 5th. Cases in which an alteration in the two sides of the pons varolii appeared to have produced a paralysis only in one side of the body. 6th. Cases in which an alteration existing in one side of the

pons varolii, or in the neighbouring parts, appears to have produced paralysis in both sides of the body. 7th. Cases in which an alteration in one side of the pons varolii, or of the neighbouring parts, has produced paralysis in the same side of the body. 8th. Cases and experiments which appear to prove that there are, in various parts of the encephalon and in the spinal cord, motor nerve-fibres which are not voluntary motor. 9th. Anatomico-pathological dissections—as those of Dr. L. Türck, of Vienna—which appear to prove that there are nerve-fibres coming from the spinal cord which decussate in parts above the medulla oblongata.

After a careful examination of these several class of facts, Dr. S. presents the following as his conclusions in regard to them:—

“1st. That reflex movements alone, and not sensations and volitions, exist in monsters deprived of a great part of their cerebro-spinal axis.

“2d. That, when the spinal cord, the medulla oblongata, or the pons varolii are altered, even considerably, sensibility and volition may continue to exist, because there are still communications by nerve-fibres through the altered parts, between the nerves of the trunk and limbs and the parts of the encephalon, in front of the pons.

“3d. That, if the reasons given by many physiologists to prove that the pons Varolii is the seat of the centre for volition, and for perception of sensitive impressions, were true, we should have to admit that the medulla oblongata is the centre—or, at least, a part of the centre—for these faculties, because the same reasons appear to prove so for this organ as for the pons.

“4th. That very likely these faculties have not their centre, at least their principal centre, in the pons Varolii, and still less in the medulla oblongata.

“5th. That it seems that, in some men, the sensitive and voluntary motor nerve-fibres do not decussate at their usual place, and that, in consequence, some rare cases may exist in which an alteration in one side of the pons Varolii, or of the medulla oblongata, will produce paralysis of the same side of the body.

“6th. That there appears to be, in many places of the encephalon, nerve-fibres which are not voluntary motor, and which, nevertheless, go to muscles either on the same side of the body as that of the encephalon from which they originate, or on the opposite side, and that these muscular nerve-fibres are able to produce convulsions when they are irritated by an injury or an alteration in the encephalon, so that convulsions may take place either on the paralyzed side or on the other.

“7th. The results of the researches of Dr. Ludwig Türck cannot, in the actual state of science, prove against or in favour of any doctrine relative to the place of decussation of sensitive and voluntary nerve-fibres.”

As this most interesting work of Dr. Séquard may not fall into the hands of a number of our subscribers, we have endeavoured to give them a pretty full account of the results to which the author has been led by his researches on the physiology and pathology of the spinal cord and other portions of the nervous centres. Though in opposition to generally received opinions, their importance, and the close and logical manner in which the investigations upon which they are based have been conducted by Dr. S., press strongly upon our attention his conclusions in respect to the place of decussation of the sensitive and motor nerve-fibres.

D. F. C.

ART. XXIV.—*Observations on Yellow Fever, and its Relations to Quarantine and other Hygienic Measures.* By S. L. GRIER, M. D. 8vo. pp. 41. New Orleans, 1854.

In relation to many questions, medical opinion would appear to move not forward, but in a circle, and hence we have the constant recurrence of doctrines which were once current for a period, and then repudiated for others of perhaps a precisely opposite character. In nothing is this more strikingly