

cance of these vesiculæ and bullæ, from their first appearance on the scene; for, even at that period, they enable us under certain circumstances to formulate a prognosis, with certainty.

The opportunity has been given me, many times, of following as it were day by day, hour by hour, the evolution of the *acute bed-sore*, in cases of apoplexy consecutive on hemorrhage, or on softening of the brain which we so often meet with in this hospital.¹

I can refer to the observations I made in regard to this, in the general description which follows, for I have been able to establish, from another stand-point, that the acute bed-sore connected with brain-diseases does not essentially differ from that which arises under the influence of spinal lesions.

Some days or even some hours only after the manifestation of the cerebral or spinal affection, or again, following on a sudden exacerbation of these affections, there appear on certain points of the skin one or many erythematous patches, variable in extent and irregular in shape.² The skin there has a rosy hue, sometimes it is dark red, and even violet, but the colour disappears momentarily on pressure with the finger. Under somewhat rare conditions, which hitherto I have met with almost entirely in cases of spinal lesions, there appears besides, involving the derm and subjacent tissues, an *apparently phlegmonous tumefaction*, which may be accompanied sometimes by acute pain, if the region has not been previously smitten with anæsthesia.

On the morrow, or after-morrow, vesiculæ or bullæ make their appearance towards the central part of the erythematous patch; they contain a liquid, sometimes colourless and perfectly transparent, sometimes more or less opaque, reddish, or brown-coloured.

Matters may remain so, as we have already mentioned, and then the vesicles and blebs soon wither, dry up, and disappear. At other times, however, the elevated epidermis becomes torn, drops off in pieces, and lays bare a bright red surface strewn with bluish and violet points or patches, corresponding with a sanguine infiltration of the derm. In such cases the subcutaneous connective tissue, and sometimes even the subjacent muscles are themselves already invaded by sanguine infiltration. This fact I have repeatedly verified by post-mortem examination.

The violet patches extend rapidly in width and their edges soon run together and unite. A short time after, there supervenes in the affected part, a mortification of the derm which, at first superficial, soon grows profound. From that time, the eschar is constituted. Later on comes the development of the work of reaction

¹ Charcot, "Note sur la formation rapide d'une eschare à la fesse du côté paralysé dans l'hémiplégie récente de cause cérébrale," *Archives de Physiol. normale et pathol.*, t. i, 1868, p. 308.

² I have ascertained, anatomically, that in such cases the derm is infiltrated with leucocytes, as happens in erysipelas.

and elimination, followed, in favourable cases, by a period of reparation which is too often impeded in its course. It is unnecessary for me, I think, to expatiate on this point.

I have been occupying your attention with minute details, but I trust I shall induce you to acknowledge that they have their own peculiar interest. R. Bright thought them sufficiently worthy of notice and novel enough to believe he should insist upon them in his "Reports of Medical Cases," and should get wax models made of the bullæ of *acute bed sore* observed in a case of traumatic paraplegia.¹ These models still figure, no doubt, in the museum of Guy's Hospital.

Since then, as far as I know, this subject has but slightly arrested the attention of observers, with a few rare exceptions.² It would be unjust, however, not to acknowledge that, in cases of typhus and typhoid fevers, a cutaneous affection, which offers the closest analogies with this disorder and which, perhaps, partly depends on analogous conditions, has been minutely described in France by Piorry,³ and in Germany, by Pfeüfer.⁴

¹ It will not be deemed inappropriate to quote here the remarks which R. Bright has appended to his cases of affections of the spinal cord, with rapid formation of bullæ and eschars, which he has consigned to his "Reports of Medical Cases," (t. ii, 'Diseases of the Brain and Nervous System,' London, 1831). First comes a case where softening of the spinal cord supervened, without any known external cause, in a young woman aged 21; the lesion occupied the lumbar enlargement immediately above the cauda equina. The case suggested the following reflections:—

"Another curious circumstance connected with paralysis of the lower extremities is illustrated by this case: the tendency which is observed in such affections to the formation of vesications or bullæ, which frequently make their appearance in a night, on some part, as the knee, the ankle, or the instep, where accidental pressure or irritation has taken place; they contain a limpid fluid which after a few days becomes opaque. It has sometimes struck me that this connection between interrupted nervous action and the formation of bullæ, might hereafter be found to throw light on that most singular disease herpes zoster which, from the peculiar pain with which it is accompanied, as well as from its strict confinement to one side of the body, seems to be connected with some peculiar condition, perhaps the distension of the sentient nerves." (p. 383.)

Three other cases relating to traumatic lesions of the spinal cord (caused by a fall from a height, the passage of a wagon, &c.) are commented on as follows:—

"The two most remarkable points to be incidentally noticed in the foregoing cases are, first, the diseased state of the bladder, resulting from its diminished power to resist injury, and from the changes taking place in the condition of the urine, detained in its most depending part, which becomes one of the most frequent causes of fatal irritation in paraplegia;—and secondly, we observe the occurrence of bullæ on the paralyzed limbs, to which circumstance I have already alluded in some remarks made at p. 383; the general inability to resist injury is likewise marked by extensive sloughing of all the paralyzed parts on which pressure is made." (p. 423.)

² After R. Bright, we must specially refer to Sir Benjamin Brodie ("Injuries of the Spinal Cord," *Med.-Chir. Transactions*, t. xx, 1837), and Brown-Séquard (*loc. cit.*).

³ A. Touzé, "Des dermopathies et des dermonécroses sacro-coccygiennes," Thèses de Paris, 1853.

⁴ Kerchensteiner's "Bericht," in 'Henle und Pfeüfer's Zeitschrift für rationelle Medicin,' Bd. v. See also Wunderlich, 'Pathologie,' t. ii, p. 285.

Let us return, gentlemen, to the *bed-sore* provoked by diseases of the nervous centres. You know too well the accidents which eschars, from whatever cause arising, are capable of engendering for me to indulge in a detailed description. Allow me, however, to sketch out in a few words the principal amongst them, for you must expect to see them often figuring in the last period of a great number of affections of the brain, and especially of the spinal cord.

The eschars, if they but attain a certain extent, constitute, as you are aware, dangerous foci of infection; and, in fact, putrid intoxication, denoted by a more or less intense remittent fever, is one of the complications they most commonly provoke.

Next comes *purulent infection*, with production of metastatic abscesses in the viscera.¹ This species appears to be seldom met with.

We shall also notice *gangrenous emboli*. In this variety, thrombi impregnated with gangrenous ichor are transported to a distance and give rise to gangrenous metastases, which are principally observed in the lungs. This is a point upon which Dr. Ball and myself have insisted in a work published in 1857.² But long before us, and even long before the theory of embolism had been Germanized, M. Foville had expressed his opinion that a considerable number of cases of pulmonary gangrene, observed in the insane, and in different diseases of the nervous centres, are caused by "the transport into the lungs of a part of the fluid which bathes the eschars of the breech."³

The process of mortification tends gradually to invade the deeper tissues. The ruin that results is sometimes carried to the highest degree; thus the trochanteric serous bursæ may be laid open, the trochanter denuded of its periosteum, the muscles, the nerve-trunks, and arterial branches of a certain calibre laid bare. But the most dangerous accidents are those determined by the denudation and loss of substance of the sacrum and coccyx, the destruction of the sacro-coccygean ligament, and the consecutive opening of the sacral canal or arachnoid cavity. In consequence of these disorders, the pus and the gangrenous ichor may proceed to infiltrate the fatty cellular tissue which envelops the dura mater, or even, if this membrane be destroyed in any point, it may penetrate into the cavity of the arachnoid.⁴

¹ Billroth und Wäckerling, in 'Langenbeck's Archiv für Klin. Chir.' Bd. i, 1861, § 470. Fracture of the sixth dorsal vertebra, rapid formation of eschar on sacrum. Manifest symptoms of pyæmia: six or eight abscesses on the surface of the kidneys. Middendorf, 'Knochenbrüch,' § 62. Fracture of the eighth dorsal vertebra. Rapid formation of eschar; pyæmia; metastatic abscesses in the lungs.

² "De la coïncidence des gangrènes viscérales et des affections gangréneuses extérieures, in 'Union Médicale,' 26 et 28 Janvier, 1860.

³ 'Dictionnaire de Méd. et de Chir. Prat.,' t. i, p. 556.

⁴ B. Brodie, *loc cit.*, p. 153. Velpeau, 'Anatom. Chirurgicale.' Ollivier (d'Angers) 'Traité des maladies de la moëlle épinière,' t. i, pp. 314, 324, 3d edi-

Under such circumstances, grave cerebro-spinal complications supervene; they may be collected into two principal classes. At one time we see a *simple purulent ascending meningitis*; at another, a sort of *ichorous ascending meningitis*, of which Lisfranc and Baillarger have reported many remarkable examples. In such a case, it is found that a puriform, grayish, acrid, and fetid liquid steepes the meninges and the cord itself, sometimes the lower part only is bathed in it, sometimes the whole cord. This liquid is occasionally found at the base of the encephalon, in the fourth ventricle, in the aqueduct of Sylvius, and even in the lateral ventricles. In all these points the cerebral matter is discoloured at its surface and to a certain depth, taking a slaty bluish tint which has several times been considered, but very wrongly, as constituting one of the characters of gangrene of the brain.¹ M. Baillarger was the first, I believe, to recognize the real nature of this alteration. What we have to note there is, above all, a phenomenon of imbibition, maceration, and *dyeing*. Remark that always, when ichorous cerebral meningitis has a sacral eschar as its starting point, the slaty tint is found throughout the whole extent of the spinal cord, it is constantly better marked there than in the encephalon, and more manifest the nearer you keep to the eschar. On the contrary, in the case where a sanious ulcer of the face, a canceroid for instance, after having destroyed the bone, has denuded the dura mater, the slaty coloration induced by ichorous maceration may, as I have many times observed, remain limited to the anterior lobes of the brain, in the regions corresponding to the bottom of the ulcer.

To these complications which I have been only able to indicate in a very summary manner, we must with Ollivier (d'Angers) connect the grave cerebral or cerebro-spinal symptoms, as yet but ill-defined, which rapidly terminate life in a great number of cases of disease of the spinal cord.

We have now to enter upon details and to show you the principal circumstances under which acute bed-sore is produced, under the influence of lesions of the brain and of the spinal cord, as well as the varieties of position and of evolution which it presents, according to the variety or seat of the lesion which has provoked its appearance. We shall also have to inquire whether the mode of production of this trophic lesion of the skin comes under the general theory which we have hitherto had to accept. With this aim, we shall successively review the different affections of the brain and of the cord which may give rise to acute bed-sore.

tion, 1837. Moynier, "De l'eschare du sacrum et des accidents qui peuvent en resulter" ('Moniteur des Sciences Médicales et Pharmaceutiques,' Paris, 1859). Lisfranc, 'Archives Générales de Médecine,' 4e année, t. xiv, p. 291.

¹ Dubois (d'Amiens), 'Mémoires de l'Académie de Médecine,' t. xxvii, p. 50, 1865, 1866.

A. *Of acute bed-sore in apoplexy symptomatic of cerebral lesions in focal centres.* It is especially observed in the apoplexy consecutive on intra-encephalic hemorrhage, or on partial softening of the brain. But it may also be produced in meningeal hemorrhage, in pachymeningitis, and finally in cases when intra-cranial tumours give rise to apoplectiform attacks. The latter have often given me opportunities for observing it in patients attacked with partial encephalitis caused by wounds received in battle.¹

The erythema, in all cases of this kind, usually shows itself from the second to the fourth day after the attack, rarely sooner, sometimes later. It affects a peculiar position. It is not in the sacral region, so commonly invaded in cases of spinal affection, that it

¹ The courtesy of my colleague, M. Cruveilhier, surgeon to La Salpêtrière, enables me to record the following fact, which I give as an example of the last-mentioned class.

The patient, Louis Ernst, a Saxon soldier, was picked up, at Villiers, on the field of battle, Nov. 30, 1870, and brought to the ambulance of La Salpêtrière, the same evening about nine o'clock. A bullet had traversed his skull, piercing it through and through; one of the orifices was situated on the upper part of the forehead, a little to the left of the median line; the other, on the right side, about the middle of the parietal bone. The cerebral substance protruded, like a mushroom, through the last-named orifice. The temporal region and the upper eyelid of the right side were ecchymosed and tumefied; profound coma. December 3d, somnolence; the patient, when interrogated sharply, mutters some inarticulate sounds; he puts out the tongue perfectly, when told; deglutition proceeds with ease. Almost complete hemiplegia is found to exist, with flaccidity of the muscles of the members of the right side. From time to time, without provocation, a sort of spasmodic contraction occurs in the superior member of this side, causing momentary pronation of the arm. The diaphragm seems to be also, from time to time, the seat of analogous contractions. The respiration, irregular at times, is calm, without stertor. There is no deviation of head, or eyes. The labial commissures are not drawn to one side. Sensibility appears much blunted over all parts of the body. No vomiting. Pulse very frequent, 140. December 4th (fifth day), same state as the previous day, but the somnolence is more intense than yesterday; contractions of the facial muscles are induced with difficulty, on forcibly pinching the skin. Involuntary passage of urine and feces. Skin warm, covered with perspiration; axillary temperature 41° C. *The commencement of an eschar is observed on the right gluteal eminence (the paralyzed side); nothing of the kind exists on the left. On the inner surface of the right thigh, a little above the knee, on a point where the flexed left knee seems to have exercised a rather prolonged pressure during the night, a bulla is found about the size of an almond, full of a lemon-coloured liquor and surrounded by an erythematous zone, of little extent. The left knee, in the part where the pressure must have been, shows no trace of erythema or of epidermic elevation. The patient succumbed on the 5th December.*

Autopsy.—The two cerebral hemispheres, at their middle and superior parts, in the points corresponding to the internal extremities of the anterior and posterior marginal convolutions, are transformed into a confused mess, partly bluish (slate-coloured). On a transverse section it is found that the softening extends to the centrum ovale (majus) of Vieussens, to the vicinity of the lateral ventricles, which, however, it does not attain, even on the left side, where the focus of the encephalitis is much more extensive, in all directions, than on the right. The optic thalami and corpora striata are perfectly normal. In the vicinity of the softened parts of the brain, the dura mater is covered with a neo-membrane, of fibrinous character, and purulent in parts. The cranium is found to be fractured in several parts, in the neighbourhood of the orifices which gave passage to the projectile.

develops, nor on any point of the median parts, but towards the centre of the gluteal region, and, most usually, if there be unilateral lesion of the brain, exclusively on the side corresponding with the hemiplegia (Fig. 3.)

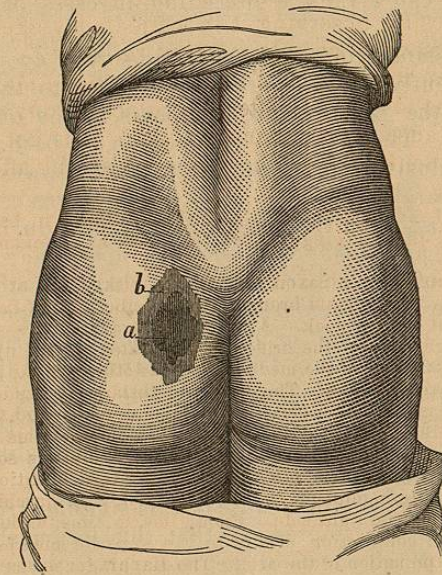


FIG. 3.—Gluteal eschar on the paralyzed side in a case of apoplexy, consecutive on hemorrhage: a, mortified portion; b, erythematous zone.

On the morrow or after-morrow, the bullous eruption and then the echymotic blotch make their appearance on the central part of the erythematous patch, that is, about two inches from the inter-gluteal fissure, and about an inch and a half beneath a supposititious line, drawn from its upper extremity, perpendicularly to its direction. Next, mortification of the derm supervenes in this same point, and it rapidly spreads, if the patient survive; but it is rather rare, on the whole, for the acute bed-sore of apoplectic sufferers to reach the stage of confirmed eschar.

It is likewise uncommon to observe, in addition to the gluteal eruption, bullæ or vesicles developed on the heel, the internal surface of the knee, and, in short, on the several points of the paralyzed lower extremity which may be subjected to a slight pressure.

I should not omit to point out to you that, according to my observations, this skin-affection appears but very exceptionally in cases which are to have a favourable termination; its appearance therefore constitutes a most inauspicious sign. We might, in fact, call it *decubitus ominosus*, or *ominous bed-sore*, by way of distinction.

This symptom, I repeat, is rarely deceptive, and as its existence may be discerned from the first days, it consequently acquires, as you will understand, a great value in doubtful cases. The very marked lowering of the central temperature, beneath the normal rate, observable at the outset of an attack, is to my knowledge the only sign that can rival the preceding, in cases of sudden hemiplegia.

The circumstances in which acute bed-sore of apoplectic patients develops, evidently do not permit us to refer to the intervention of pressure on the parts where it appears, as the only element in its production. The pressure is the same on both nates, but the eruption is exclusively produced, or at least always predominates in that of the paralyzed side. Many a time I was careful to make the patient repose upon the non-paralyzed side, during the greater part of the day, and this precaution has not in any way modified the production of the eschar. Besides, what, in such a case, could be the influence of a pressure which is only in operation for two or three days? Nor can the irritating contact of urine be given as the cause. In several cases, I have had this liquid drawn off hour by hour, day and night, during the whole time of the disease, in order to avoid as much as possible the irritation of the skin of the seat, and in spite of every care, the eschar was produced in accordance with the rules I have indicated.

What may be the organic cause of this singular trophic lesion? I was long under the impression that this lesion should be considered as one of the effects of neuro-paralytic hyperæmia, which betrays itself always, in a more or less prominent manner, you are aware, in members struck with hemiplegia of cerebral origin, by a comparative elevation of temperature. But this hypothesis is, as we shall see, open to a number of objections. The facts which will be set forth, as we proceed, render it probable that we must here recognize the irritation of certain regions of the encephalon, which, in the normal state, are believed to exercise a more or less direct influence over the nutrition of different parts of the external tegument.

B. Of acute bed-sore of spinal origin. When acute bed-sore appears under the influence of a lesion of the spinal cord, it shows itself in the very great majority of cases in the sacral region—and consequently above and internal to the chosen seat of eschars of cerebral origin. Here it occupies the median line and extends symmetrically, on either side, towards the adjacent parts. (Fig. 4.) It may, indeed, happen that only one side will be affected—in the case, for instance, where a lateral half of the cord is alone engaged, and then the cutaneous lesion frequently shows itself on the opposite side of the body from the spinal lesion.

The influence of attitudes here plays an important part. Thus it is customary when the patients are so placed as to repose on

the side, during part of the day, to find, besides the sacral eschar, vast necrosive ulcerations developing on the trochanteric regions. It is also common enough to see, contrary to what happens in cerebral cases, that the different parts of the paralyzed limbs which are exposed to even slight and brief pressure, as the ankles, heels, and inner surface of knees, present lesions characteristic of acute bed-sore. Eschars may also show themselves, but indeed very rarely, on a level with the apex of the scapula, or over the olecranon process.¹

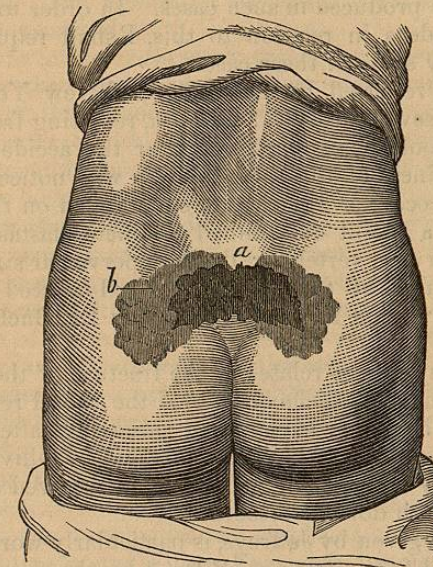


FIG. 4.—Eschar of the sacral region in a case of partial myelitis occupying the dorsal region of the spinal cord: *a*, mortified portion; *b*, erythematous zone.

Speaking generally, we may say that the spinal lesions which produce acute bed-sore are also those which give rise to rapid muscular atrophy and to other disorders of the same class. The almost simultaneous development of these different consecutive affections makes it seem probable, already, that they have a common origin.

It behooves us to remark, however, that this rule is far from being absolute. As a matter of fact, it is a characteristic of certain spinal affections that rapid muscular atrophy is developed without being accompanied by eschars; whilst there are others, on the contrary,

¹ W. Clapp, 'Provinc. Med. and Surg. Journal,' 1851, p. 322, and Gurlt, *loc. cit.* p. 110, No. 76.

where the eschars may be produced without the nutrition of the muscles in the paralyzed limb being affected. This is, in truth, a fact of great interest from the standpoint of pathological physiology, and one which we shall take care to bring into prominence (Fig. 4).

(a) We will mention, in the first place, the traumatic lesions of the spinal cord, those in particular which result from fractures or luxations of the vertebral column. Numerous cases of this kind, recorded by Bright,¹ Brodie,² Jeffreys,³ Ollivier (d'Angers),⁴ Laugier,⁵ Gurlt,⁶ and some others,⁷ show with what rapidity sacral eschars may be produced in such cases. In order to enable you to form distinct ideas, in relation to this, I shall request permission to relate briefly some of these cases.

In one case, reported by Dr. Wood, of New York,⁸ there was fracture of the seventh cervical vertebra, resulting from a fall down stairs; death took place four days after the accident. From the second day, redness of the sacral region was noticed, and a bulla formed at the coccyx. Hæmaturia supervened on the third day.

A fall from a height determined complete diastasis of the sixth and seventh cervical vertebræ; death supervened sixty hours after the accident, and, at that period, a well-marked bed-sore was already visible. This fact is recorded by Dr. Buchner, of Darmstadt.⁹

One of Jeffrey's cases relates to the fracture of the fourth dorsal vertebra; a confirmed eschar occupied the sacral region, from the fourth day. The eschar supervened three days after the accident, in a patient whose history has been narrated by Ollivier (d'Angers), on the authority of Guersant, and who had received a bullet in the body of the eighth dorsal vertebra.

Another case, given by Jeffreys, is particularly worthy of interest. The patient had fallen, from a ladder, a height of twenty-five feet. On post-mortem examination it was found that the bodies of the seventh and eighth dorsal vertebræ were broken in several pieces, and had been much displaced. On the day of the fall, the skin was cold, and the pulse barely perceptible. All the parts below the fracture were deprived of sensibility and motion. Next day, there were continual erections; "then supervened phlyctenæ in

¹ R. Bright, 'Report of Medical Cases,' t. ii, pp. 380, 432, London, 1821.

² B. Brodie, 'Medic.-Chirurg. Transactions,' p. 148, t. ii, 1836.

³ Jeffreys, "Cases of fractured spine," in 'London Med. and Surg. Journ.,' July, 1826.

⁴ Ollivier (d'Angers), *loc. cit.*, t. i.

⁵ Laugier "Des Lésions traumatiques de la moëlle épinière," 'Thèse de concours,' Paris, 1848.

⁶ E. Gurlt, 'Handbuch der Lehre von den Knochenbrüchen,' 2 Th. i. Liefer Hamm. 1864.

⁷ See an interesting chapter on this subject in Herr Samuel's work, *loc. cit.*, p. 239.

⁸ Gurlt, *loc. cit.*, Tableau No. 97.

⁹ Gurlt, *loc. cit.*, No. 86.

the region of the sacrum," and, on the same day, "the patient recovered his sensibility." I point out this last feature to your attention, because many authors have endeavoured, very erroneously, as you see, to make anæsthesia play an important part in the pathogeny of acute bed-sore of spinal origin. The persistence of sensibility, in the parts situated below the lesion, is also marked out, in a more or less explicit manner, in a case recorded by Colliny,¹ relating to a fracture of the seventh cervical vertebra, where the eschar appeared on the fourth day, as well as in a case mentioned by Ollivier (d'Angers),² where there was fracture of the twelfth dorsal vertebra. The eschar, in the latter case, made its appearance on the thirteenth day.

It is useless to multiply these examples, for all surgeons agree in acknowledging that the rapid formation of eschars is one of the most common of the phenomena consecutive on spinal lesions resulting from fracture with displacement of vertebræ. According to Gurlt, whose opinion as regards this subject is based on the study of a very large number of observations,³ it is from the fourth to the fifth day after the accident that the first symptoms of acute bed-sore most usually commence to appear; but they may, as we have just seen, set in much earlier, as on the second day, and even sooner. It seems, and the remark has been made by Brodie, that the production of eschars occurs early in proportion as the lesion affects a high point of the cord. On the other hand, it would result from the statistics drawn up by J. Ashhurst that nutritive troubles become frequent in proportion as the wound is lower down. Thus, according to this author, eschars were only observed in three cases, after lesions of the cervical region (being $\frac{1}{41}$ per cent.); twelve times (or $\frac{2}{3}$ per cent.) for the dorsal region, whilst as regards the lumbar region, the proportion rose to 12 per cent. (seven cases).⁴

Priapism, clonic convulsions of variable intensity, supervening in the paralyzed members, either spontaneously or induced, tonic convulsions coming on in paroxysms—all those symptoms, which usually reveal a state of irritation of the cord and meninges, have been many times mentioned among the phenomena which, in fractures of the vertebral column, precede, accompany, or closely follow the precocious formation of eschars.

In such circumstances, as we have already seen, anæsthesia, of the parts smitten with motor-paralysis, is not a constant fact. As to the remarkable elevation of temperature of which these parts

¹ Quoted by Ollivier (d'Angers), *loc. cit.*

² Sensibility was also preserved in Dr. Büchner's case, quoted above, where the eschar appeared before the close of the third day.

³ See Gurlt, *loc. cit.*, p. 94, analysis of 270 cases.

⁴ J. Ashhurst, "Injuries of the Spine, with analysis of nearly 400 cases," Philadelphia, 1867.

sometimes become the seat in consequence of vaso-motor paralysis,¹ it cannot now be ascertained whether it was then present or not, the attention of the observers not having been drawn to this particular phenomenon. We shall note, on the contrary, as a symptom which shows itself frequently at the same time as the acute bed-sore, the emission of sanguinolent urine, alkaline in reaction, and sometimes purulent. This is a fact to which we shall have occasion to revert. Necroscopical examination, hitherto, has not, in general, revealed anything in connection with spinal lesions which can be considered peculiar to the cases where rapidly developing eschars are produced. We frequently, however, find mention made of alterations of the spinal cord, which place beyond doubt the existence of an inflammatory process; the presence of purulent infiltration, and even the formation of abscesses in the midst of the softened parts, have been observed in several instances.

b. The study of cases of hemiparaplegia, consecutive on wounds involving only a lateral half of the spinal cord, may furnish useful information concerning the pathogeny of acute bed-sore, and of some other trophic disorders of spinal origin. We learn, from the experiments of M. Brown-Séguard, that, after wounds of this kind, there supervenes in animals motor-paralysis of the lower extremity, on the same side with the lesion. The limb presents also a more or less marked degree of exaltation of tactile sensibility, and it likewise offers a notable elevation of temperature correlated with vaso-motor paralysis. The opposite limb preserves, on the contrary, its normal temperature and power of motion, whilst the tactile sensibility is much lessened, and may even be extinct. All these particulars are exactly reproduced in man under analogous circumstances. In his case, as in that of animals, we may also find different trophic derangements supervening, which appear almost simultaneously, and which are all manifestly due to spinal lesion. Among the nutritive lesions of this kind observed in man, we would especially point out the rapid diminution of the (faradaic) electrical contractility of the muscles, soon followed by atrophy,—a particular form of arthropathy to which I shall refer in a few

¹ In a case of fracture of the vertebral column in the dorsal region, observed by J. Hutchinson, on the second day after the accident, the temperature of the feet, taken at the inner ankles, rose (to 101° F., or) above 38° Cent. In the normal state, according to observations made in London Hospital, by Dr. Woodman, the thermometer placed between the two first toes gave an average of 27.5° C. (81.5° F.), the maximum being 34.5° C. (94° F.), and the minimum 21.5° C. (70° F.). See J. Hutchinson, "On Fractures of the Spine," in 'London Hospital Reports,' t. iii, 1866, p. 363. See also H. Weber and Gull, in 'The Lancet,' Jan. 27, 1872, p. 117. Clinical Society of London. [See also Mr. J. W. Teale, "Case of Remarkable Elevation of Temperature" after injury of the spine, in a young lady, where 122° F. (50° C.) is stated to have been observed, 'Lancet,' 1875, p. 340; and J. Hutchinson, "On the Temperature and Circulation after Crushing of the Cervical Spinal Cord," 'Lancet,' 1875, pp. 714, 747.] (S.)

moments—and finally, acute bed-sore. It is a remarkable thing that, whilst the arthropathy and muscular atrophy are to be found in the limb on the same side with the lesion, the eschar seems to prefer, as we have already remarked, to show itself on the member of the opposite side, where it occupies the sacral region, and the gluteal, in the immediate neighbourhood of the former. This peculiar disposition of the eschar in relation to the seat of the spinal lesion is, according to what M. Brown-Séguard has told me, a constant fact in the case of animals; in man, it has already been several times observed.

As an example of the class, I shall briefly cite the following facts;

A man, aged twenty years, whose history has been related by M. Viguès,¹ received on the back of the thorax, between the ninth and tenth dorsal vertebræ, a sword cut which, to judge from the symptoms, injured the left lateral half of the spinal cord chiefly. Motor paralysis immediately ensued, which, at first affecting both the lower extremities, appeared from the next day to be almost entirely confined to the left leg. Hyperæsthesia is very manifest in the latter member; the right limb presents, on the contrary, a well-marked obtundation of sensibility, whilst the power of motion has nearly quite returned. The symptoms showed rapid improvement up to the twelfth day after the accident; on that day it was remarked that, without perceptible cause, the *left* leg, still more sensitive than in the normal state, had increased in volume, and also that in the left knee-joint there had accumulated a quantity of fluid sufficient to keep the patella raised half an inch above the condyles. Two days later an eschar was observed occupying the *right* lateral part of the sacrum and right gluteal region.

The case recorded by MM. Joffroy and Salomon,² of one of Dr. Cusco's patients, which was recently communicated to the *Société de Biologie*, reproduces, as it were, the foregoing case, even in its smallest details. In the former, as in the latter, after a traumatic lesion affecting one lateral half of the cord in the dorsal region, we find motor paralysis supervening in the inferior extremity that corresponds to the injured side; this limb presents a notable augmentation of temperature—a fact not mentioned by Viguès, though probably present—and manifest hyperæsthesia; whilst the opposite limb, unharmed in its motor functions, offers a remarkable diminution of all kinds of sensibility whilst preserving the normal temperature. In addition, and this is the point which we desire to put especially forward, shortly after the accident, and without any appreciable cause, there supervened an arthropathy in the knee of the paralyzed limb, whilst, in the vicinity of the sacral region,

¹ Brown-Séguard, 'Journal de la Physiologie,' &c., t. iii, p. 130, 1863.

² 'Gazette Médicale de Paris,' Nos. 6, 7, 8, 1872.