MEDICAL EVIDENCE IN RAILWAY ACCIDENTS.

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I.—INTRODUCTION.

Duty of Medical Men in Railway Accidents. Settlement of Claims. Why Medical Witnesses for the Plaintiff swear one thing, and the Medical Witnesses for the Company another. The "Railway Spine". Mr. Erichsen. Real and Imaginary Injuries. Injuries to the Spine only dangerous in proportion to the degree in which the Chord is affected. Paralysis. Objective and Subjective Symptoms, etc.

ONE morning, a solicitor called upon me, and stated "that Mr. — had been injured in a railway accident; that Mr. — was in attendance; that he wished me to see the patient with him"; and, he added—"take notes of the case, for we shall probably want you to give evidence in an action against the company." My reply was: "How do you know that my evidence will be of use to you? I will see the gentleman with pleasure with the surgeon of the family, and report to you the opinion we may form of the nature of the injuries your client has sustained. But you must pardon my saying that a physician forgets what is due to himself and the public, when he undertakes to become an *advocate* instead of a *witness*." In this instance, after our consultation, the medical officer of the company was invited to see the patient with us. There was no difference of opinion; and, in the end, a conclusion was arrived at, alike satisfactory to the directors of the railway company, and to the family of the gentleman who had been injured. And here, I would venture to suggest, that such a course as this ought always to be taken, and the physician or surgeon of the company invited to see the case. I have had during the last twenty-five years no little experience of railway accidents, and of injuries to the spine from other causes. I have of late years been many times consulted, both by the friends of the sufferers, and, also, by the railway officials; and in a great majority of such cases, where there has been no attempt at exaggeration or fraud, there has been a prompt and fair settlement of claims; and, consequently, an avoidance of the public scandal which so frequently occurs in our law courts, when medical witnesses called by the plaintiff swear one thing, and medical witnesses called by the company, another.

Of course, I exclude from a chance of such honourable and satisfactory settlement a class of actions which, unhappily, are daily becoming more and more common; actions touted for, and got up on speculation, for the mere purpose of obtaining costs—actions in which the plaintiffs play a very insignificant part, and obtain a very small share of the plunder—actions, which every honourable member of our profession must feel it his bounden duty to discourage by every means in his power.

There has recently been tried in London, an action against the South-Eastern Railway Company, in which two of the most eminent hospital surgeons gave opinions the most opposite. More than this. Two colleagues—two distinguished teachers in the same school—gave in this case opinions completely at variance, not only as to the nature of the alleged injury, but also as to the probable duration of the effects of the accident.

How is this? Let any man who has been long and extensively engaged in consultation practice ask the question fairly, if this difference of opinion exists between himself and the various brother practitioners he is daily in the habit of meeting at the bedside of his patients; and the answer must be, that between two men of experience, such differences of opinion as these are certainly the very rare exception, rather than the rule. Why then is it, that only when medical men become witnesses in railway accidents all is darkness and confusion? Why is it that such injuries alone lead men to contrary conclusions? This is a question, the importance of which it is quite impossible to over-estimate. On the one hand, every traveller who suffers in consequence of accidents caused by the negligence of the servants of a railway company, has a just claim for the most liberal compensation; on the other hand, be it remembered, railway shareholders—many of them widows and orphans, whose all depends on the payment of the dividends—have their rights as well as the passengers they carry, and for whose comfort and convenience they provide; and it does appear every day more and more questionable, whether the present mode of assessing damages by a jury

be the best way of arriving at a correct conclusion. Last year, as the President of the Yorkshire Branch of the British Medical Association, I felt it my duty to bring the question of medical evidence in railway accidents prominently before the members; and the hearty acquiescence in the opinions I then ventured to express, induces me to pursue the subject.

Mr. Erichsen, in his work *On Railway and other Injuries of the Nervous System*, says:—"Actions for damages for injuries alleged" (the italics are mine) "to have been sustained in railway collisions, have become of such very frequent occurrence, as now to constitute a very important part of medico-legal inquiry." (Page 45.)

On this "alleged" or asserted plea, the whole question rests; and, in every case, it is the bounden duty of the medical examiner to separate the real from the unreal; to carefully consider the exact nature of the injury said to have been sustained; to note if the symptoms described by the patient, are such as have been observed to be present in injuries to the same part, and especially to the spine, that have not been occasioned by an accident on a railway, and where a trial by jury and the prospect of obtaining heavy damages have not been present. Is it because the medical men called by the plaintiffs or their solicitors in these cases, receive too readily as true the statements made to them by their patients, and because the medical men called by the railway company to investigate the exact nature of the injury, and the probable duration of its effects on the system, rely on *objective* rather than *subjective* symptoms, that the differences of opinion, to which allusion has already been made, so frequently occur?

My own experience, I doubt not, is the same as that of every other medical man who has been frequently called in to cases, in consequence of an accident on a railway;—namely, that real, or *imaginary*—(and I use the word *imaginary* most advisedly)—affections of the spine are among the most frequent; and therefore, before narrating what has been observed in some of the injuries that have come under my own notice, it may be well to consider what are the symptoms and effects of injuries of the spine from whatever cause arising. The "*railway spine*", as it is termed, has no right, I confidently submit, to the peculiar place assigned to it. An injury to the spine, whether occasioned by a collision on a railway, or by a fall from a scaffold, can only be dangerous in proportion to the extent in which, at the time of the accident or subsequently, the spinal chord or its membranes are affected. What we have to fear in injuries of the spine, including fracture and dislocation, is inflammation of the spinal chord or its membranes and hæmorrhage into the spinal column; and, therefore, acute and chronic inflammation of the coverings of the chord; acute, and chronic inflammation of the substance of the chord; induration of the chord; apoplexy of the chord; chronic softening of the chord; are, one and all, subjects of no little interest. Acute myelitis, it is hardly necessary to remark, frequently arises from other causes than direct injury resulting from fracture of the spine, concussion of the spinal chord, or effusion of blood. One of the most painful cases of chronic myelitis I ever witnessed was seen in consultation with the late Mr. Sykes. It occurred from exposure to cold; the man, aged 54, having been immersed in cold water for some hours at the time of the great flood at Sheffield, caused by the bursting of the water company's dam. According to my experience, there is no more frequent exciting cause of acute and chronic inflammation of the chord, than exposure to cold.

The symptoms of spinal injury will depend not only on the degree in which the chord primarily or secondarily is affected, but also on the portion of it the functions of which are interfered with.

If the injury be of such a nature as to completely compress or divide the chord—provided the injury be not so high up as to cause instant death—all the parts below the seat of injury will have lost both sensation and motion.

Mr. Erichsen has pointed out that, in injury to the lower part of the spine, "there may be paralysis of all those parts supplied by the nerves of the sacral plexus, whilst those from the lumbar plexus are not affected"; i.e., the sensibility being perfect above the knees and lost below them, the exact seat of injury becomes marked; for it evidently is above the one and below the other set of nerves. As a rule, in these cases, there is a diminished temperature. In a few weeks the whole body wastes, the pulse becomes feeble, the patient is cachectic, the countenance is indicative of disease and suffering, and there is generally exfoliation of the cuticle.

If the seat of injury has been at the lumbar, or lower dorsal part of the spine, there will follow, as a matter of course, paralysis of the parts which derive their nerves from the sacral or lumbar plexuses, or from both of them. Paralysis of the lower extremities—of the genital organs; and of the trunk, so high as the injury; relaxation of the sphincter ani and inability to retain the fæces; at first, a paralysed condition of the bladder and retention of urine—which, however, after a time, dribbles away,

The urine, in the course of a week, is generally found to be ammoniacal; and it is wonderful how men who have met with injuries to this portion of the spinal chord, live on, month after month, dying by inches, and, at last, slowly sinking, under sloughing bed-sores, and some low type of inflammation of the bladder.

If the seat of injury has been at the upper portion of the dorsal region, in addition to the symptoms already pointed out, there is added a train of symptoms indicative of paralysis of the expiratory muscles. Expiration is now altogether dependent on the elasticity of the walls of the chest; because the intercostal muscles have no longer the power of acting—and so sneezing, coughing, etc.—are no longer capable of being performed. It is hardly necessary to point out, that inspiration is carried on almost entirely by the diaphragm; and that, the blood not being arterialised, congestive pneumonia, in a very short period, terminates the life of the patient.

If the lower cervical region be the part injured, there is also, as the result of the injury, paralysis of the upper extremities, and the inspiration is altogether diaphragmatic.

Such is an *epitome* of the symptoms of injury to the different portions of the spinal chord which I have seen in my long experience. The student must not expect to find them exactly as described, in every case that may come before him. It is one thing to diagnose concussion, or any other present, remote, or possible result of spinal injury, to the satisfaction of the examiners at the London University, or the Royal Colleges of Physicians and Surgeons; and altogether another thing to do it at the bedside of a patient.

I quite agree with Dr. J. Ogden Fletcher, (whose work on *Railways in their Medical Aspects* has been described as pleading as eloquently in defence of railway companies, as does the work of Mr. Erichsen on the other side of the question), that, in every case where a claim is set up for compensation, we are bound to "*attach very considerable importance to moral evidence.*" Many years ago, I was employed in a case, where a young and highly educated physician had been deceived by a patient, who pretended that he was paralysed, in order to obtain compensation from an assurance company. This man played his part with no little skill; and suffered a pin to be run into his legs without moving, or betraying pain; and yet, in the end, he was proved, beyond doubt or question, to be feigning disease.

Again, every physician and surgeon must have seen cases of hysteria in the male. I had such a patient a few months ago, and I know he was attended by other physicians in Sheffield. He was a strong muscular man, aged 40, in whom the morbid nervous exaltation was such that he screamed on touching the spine or left side with a feather, although, when his attention was arrested, he could bear any amount of pressure on the same parts.

For many years past, medical writers have pointed out—and no one more ably, more fully, and more clearly than my old teacher, the late Sir B. C. Brodie—that, after a shock to the nervous system, symptoms *altogether subjective* are often present, similar to what we note in *real* affections of the nerve-centres. This state of things I have very frequently seen after railway accidents, and that, too, in ladies, and in those who have had no wish nor intention to deceive. The absence of *objective symptoms* in such cases will always enable us to form a correct diagnosis, and to decide between real and imaginary spinal disease.

It is quite impossible to shut our eyes, however, to the fact that persons, who have received very slight injuries, frequently greatly exaggerate their degree, or consequence, in order that they may induce a jury to give them a disproportionate compensation. When, therefore, I am called upon to examine for the purpose of legal investigation one of these doubtful cases of impaired function—said to have been the result of an accident—I feel it incumbent to collect all the information in my power respecting the person's moral and physical habits, and probable motives; and to inquire if the alleged causes of the disease are founded on fact, or probable. And more especially is it important to ascertain whether the pathognomonic symptoms of the supposed disease are present. This task, though difficult, is not altogether a hopeless one. The simulator of disease is apt to overact his part, to give a detail of incompatible symptoms, and greatly to exaggerate unimportant lesions.

If called to a man, then, who has been in a railway collision, and who tells me that he received a blow on the spine, or a jar, or a twist, or a sprain, or concussion; that he is now quite unable to move his legs, or even to turn himself in bed—and, especially, if there had been no immediate symptoms following the injury of impaired or altered function of the nerve-centre, but some weeks or months after the accident, and when it was almost forgotten, these symptoms indicative of serious disease are said to have appeared; when this goes on week after week—the man still remaining, apparently, without the power of moving in his bed—his lower extremities stated to be without sensation or motion—with a healthy looking countenance—no marked lesion of nutrition—no

difference of temperature between the parts said to be paralysed and the rest of the body—perfect command over the bladder and rectum—pulse natural—no bed-sores—no flattening of the nates or calves of the legs—and I am drawing no imaginary picture here—I say, emphatically, there is a total absence of the objective symptoms which I have seen during the last thirty years, in all the numerous cases of serious spinal injuries that I have attended. In all cases, therefore, where the pathognomonic symptoms of the alleged injury are absent, who will venture to say they ought not to be submitted to the most searching, careful, and fearless investigation?

I have used the terms *objective* and *subjective*. By objective, I mean whatever is exterior to the mind—outward, external; something that we can see. To this, the term subjective is altogether opposed. In the former case, I depend on the evidence cognisable to my senses; in the latter, there is nothing to depend upon, save the statement of the patient.

The result of my experience has been this: that I have never yet seen a case of injury, the result of a collision on a railway, where the symptoms have been subjective only, in which the favourable verdict of a jury, and the payment of the damages awarded, has not been followed (generally very rapidly), sooner or later, by complete restoration to health and strength.

I must reserve to the next number, a series of most interesting cases, illustrative of railway accidents and their results.

ON THE USE OF THE SPECTROSCOPE AND MICROSCOPIC TOSCOPE IN THE DISCOVERY OF BLOOD- STAINS AND DISSOLVED BLOOD.†

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THE spectroscope which has been mounted on this stand is so perfect in its action, that it readily exhibits Fraunhofer's lines in solar or in lunar light, and it divides the bright yellow sodium line D into two when properly adjusted. It therefore gives great accuracy of observation; and the stronger dark lines of the solar spectrum become so many fixed points for the comparison of the position of the dark absorption bands of various coloured solutions when they are observed by daylight. One disadvantage attendant upon the employment of this form of spectroscopy is the quantity of material necessary to be employed. Several drops of blood must be at the disposal of the operator, to get a sufficiently coloured solution to fill the little test-tube used in the optical examination.

By modifying the instrument and introducing a longer tube for containing the liquid to be examined, say a column six or eight inches in length, it would be possible to discover one drop of scarlet cruorine in a pint of distilled water without much difficulty—a quantity so minute that no perceptible colour would be visible to the unaided eye, and no other method of analysis would be capable of detecting it.

Quantities like these are not always to be had; and a recent well-known case, in which I had the opportunity of first using the micro-spectroscope in a medico-legal inquiry, would have failed altogether if I had depended alone upon this "fluid spectroscope," as nearly all traces of blood-stains had disappeared from the weapon employed by the murderer, in consequence of the hatchet having been left exposed in the woods near Mountain Ash for several weeks after the deed was accomplished. (Case—Reg. v. Robert Coe; Swansea Assizes, 1866.)

It was only on the removal of the head of the hatchet that any appearances of blood were to be obtained from the surface of the handle, which had been protected by the iron ring; and, on carefully making thin sections of these stained portions of wood, and treating them with distilled water, a few drops only of a brownish coloured fluid were obtained, which coagulated and became discoloured on boiling; also another drop, when placed in a very minute tube about half an inch long, and the one-eighth of an inch diameter, the total contents of which tube were one grain and one-third of distilled water, gave the optical absorption bands due to old blood. This little drop of bloody-coloured fluid was placed on the stage of the microscope, and examined with an inch Ross's objective, illuminated by an achromatic condenser; and the microspectroscope was inserted into one of the tubes of a binocular microscope, as an ocular lens would be employed. This form of instrument is that known as the Sorby-Browning Spectroscope, and it admits of great precision, as it has a lateral spectro-

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