which was very plainly made out, consisted of two fragments wedged down on the brain, the soft surface of the meninges. The hematoma covering the field of the pressure was pulsating synchronously with his heart, and it was with a good deal of fear that I made an incision. I feared I would have a troublesome hemorrhage before I could trephine and remove one of the fragments of bone in order to get to where I could control hemorrhage. However, on making the incision there was just one gush of an ounce or so of blood, and no further hemorrhage. It was an absolutely clean operation, the pulsations having been transmitted from the brain substance itself and communicating through the triangular openings above and below the angles of the fracture. It was quite a slow operation, cutting out the first fragments of bone, inasmuch as they were wedged down in the shape that it took a great deal of lifting force to get out the fragments of the bone. The symptoms which the boy presented were a semi-unconsciousness, some vomiting, unequal pupils, symptoms of partial compression. I removed one of these fragments of bone, elevated the other, and that boy never had a rise of temperature above 99.6, and in eight days after the injury was out playing ball. There were three lacerations of the meninges; there was an escape of a teaspoonful or more of cortical substance; there was absolutely no functional trouble; there were no symptoms following the injury save that he has a depression in which you can lay a finger.

DR. DANIELS—I feel that we are largely indebted to Dr. Perkins for this instructive paper. I rise to differ from Dr. Peck in regard to miscellaneous trephining in linear fractures. I do not quite favor that, but I do believe that age should have very much to do with all operative measures in that direction. I have found in my experience that children or very young people will bear considerable depression or a great number of linear fractures without any bad symptoms at all, while persons of middle age or beyond, having comparatively the same injury, will have very serious results follow. In adults the use of the trephine is almost imperative. I believe that the consideration of age in these cases, so far as I am able to judge from experience of a considerable number, covering perhaps two hundred in the hospital where I am associated, is an essential one.

DR. JAY—We all admit that in young persons you can have a depression of the skull and probably have no spasms and no paralysis, but experience will tell you that in after life they are sure to have them if the depression is left. I have operated on several cases, twelve, fifteen and twenty years ago, and for years afterward there would be no unfavorable symptoms, but about the time of puberty they would appear. One case is a woman, where the depression remained and afterward required trephining. It is not good surgery to delay trephining.

DR. PECK—Dr. Jay misunderstood, I did not refer to depression; always trephine where there is depression.

It was moved by Dr. Peck and seconded by Dr. Maynard, that the thanks of the Academy be extended to Dr. Perkins for his elaborate and learned paper. Carried.

DR. PERKINS—I wish to thank the Fellows for their very kind reception of the paper, and also to speak of one or two things that have come up. First, in regard to those extradural hemorrhages. I have recently received a report of 160 cases that were done in one hospital by one group of men acting together, and out of those 160 cases, 64 were cases of extradural hemorrhages from the meningeal artery in brain injury. As this is nearly 40 per cent. of the cases, one is justified, perhaps, in cases of an unconscious patient, without any symptoms, in going inside the meningeal artery rather than see the patient die. You will have forty chances in one hundred of relieving him. The basal hemorrhages are more rare and diagnosis is more difficult. The treatment of

basal hemorrhage would be more difficult than the diagnosis but it has often been suggested in my mind how easily we could relieve, in a fresh case of basal hemorrhage, if we knew where it was, by a simple insertion of a hollow needle down through the cerebral mass. We often insert a needle into the brain substance in search of an abscess and no harm is done, and I see no reason why we could not put a hollow needle into the basal hemorrhage if we could know where it exists. It would not be necessary to raise the brain from the base of the skull. In regard to the magnitude of certain injuries, it has been stated by one authority that there was no brain injury so great but that it could be recovered from and none so small but what death might result. The most terrible wound I know of was in the case of a man who was struck by a tamping iron, which passed through the malar bone and passed out through the cortex. I have seen the tamping iron; it was a very heavy bar, and went lengthwise through the skull and produced a very terrific injury. The man recovered and has all his faculties, as far as known.

In regard to the position of the speech center, and the loss of certain portions of the cerebral matter we know that the speech center lies in the third left frontal convolution, but it has been found that after the loss of it, its function is taken up by the opposite side of the brain. There is a certain interdependence of the brain from one side to the other, which is used in this case, and so paralysis of speech, permanent paralysis, does not result.

In regard to exploratory operation in simple linear fracture, I do not believe in operating for nothing, and if there are no other symptoms present, I doubt if one would be justified in interfering. One operates for symptoms, not for nothing.

PERSONAL EXPERIENCE IN SPINAL INJURIES.

Read at the Second Annual Meeting of the American Academy of Railway Surgeons, held at Chicago, Ill., Sept. 25-27, 1895.

BY J. F. PRITCHARD, M.D.

DISTRICT SURGEON C. & N. W. RAILWAY.
MANITOWOC, WIS.

The question of spinal injuries has been so much discussed that one feels like apologizing for presenting anything more on the subject, but as it is yet vital in some measure, we must continue our investigation until we have an approximation to the truth.

In going over my records, carefully kept for many years, involving every case of injury on one line of road, I find that an average of injuries to the back was thirteen per thousand. These include all classes of injuries, and are noted on my reports as contusions, sprains, twists, and injuries which are popularly called concussions, also dislocations, fractures and serious injuries of like nature to the spinal column. But what is remarkable is that of these injuries caused by falls, blows, or other like causes incident to railway life there was but one in which recovery was not complete and permanent. My experience would therefore tend to show that so called railway spine is a myth. In reporting cases, I limit myself to those that had marked symptoms.

Case 1. P. S. Cooney, aged 19; Irish-American, good habits, a freight brakeman, was standing at a switch at a small station to close it as the train passed out of the siding. The ground was slippery and wet, when he, in some way not very well explained, fell under the caboose. He claimed that the wheels ran diagonally across his hip and the lower lumbar region, which statement was corroborated by his conductor who claimed to have been standing on the ground with his lantern and saw the accident. I think they were mistaken, as the car had switch ropes, chains, links, pins, etc., the usual complement for such cars, which would add about 3,000 pounds to its weight, and would no doubt have killed him instantly. My

theory was that he fell in such a position as to go through under the brake-beams and truck-frames, probably doubled up. He no doubt was run over in some such way. When first examined, in an hour or two after receiving the injury, I could find no marks on his body, *i. e.*, no wheel mark or contusion. The spines of the upper lumbar vertebræ were fractured and displaced laterally to a slight extent. He complained of little pain, was totally unable to move his body or legs; had no loss of sensation other than a numbness; no paralysis except as above noted, which seemed to be only an inability to move temporarily. He had full control of bladder and bowels, took his food well and had no rise of temperature at any time. In the course of a few days he complained of a soreness of the muscles with external tenderness over the whole region below the point of injury. This condition improved gradually. He was discharged and resumed labor as flagman on a passenger train, having lost seventy days' time. When discharged his general condition was very good. He had perfect use of all of his muscles and no other difficulty except a slight deviation of the vertebral spines.

Case 2.—Lucian Budyszcz, age 18, Polish laborer, was run over by a caboose which he and a number of others were endeavoring to push out of a side-track by hand. The switch was open and a switch engine coming through the yard at the rate of fifteen miles an hour, struck the caboose and injured several men. Budyszcz's injuries were multiple and complicated as follows: Right elbow and forearm laid open, requiring resection; comminuted fracture of left femur; injuries to his toes, requiring amputation of two or three; dislocation or fracture of all of the fingers on both hands; injury to the spine similar to Case 1, *viz.*, fracture of spinous processes in lumbar region. He complained from the beginning of severe pain in his back, and required large doses of morphin to relieve the pain which lasted nearly two weeks. There was no paralysis or loss of function of any organ, and recovery was complete so far as the spinal injury was concerned. The other injuries healed kindly. He was under my charge about six months, until a settlement could be made with him. He never complained of any spinal symptoms afterward.

Case 3.—R. Kroll, age 28; German, foreman of a gang of track layers, who when going and returning from work used two ordinary hand-cars. They frequently raced on returning, and at the time of this accident were racing. A wheel broke while they were running at a high rate of speed, throwing the whole crew forward in front of the car. One man was killed instantly, another received slight injury, while the subject of this sketch fell under the car and was caught at the junction of the last dorsal and first lumbar vertebra in the gear of the car, causing a dislocation. He was immediately paralyzed from this point downward. We operated later and reduced the dislocation by carefully dissecting free the attachments of the spinous processes, then by making lateral traction on the opposite spinous processes with extension from his feet and shoulders, the dislocation was easily reduced. The spinal canal was not opened. He did not require an anesthetic for the operation, and said he had some return of sensation afterward. He died two weeks later. In this case, while we did not have the privilege of a post-mortem examination, it was quite evident that the cord was completely or nearly severed.

Case 4.—John Adamski, Polish, section foreman, age about 40, was attempting to remove his hand-car from the track to clear a special train. The car was struck and he was thrown off, causing contusions of the lumbar and sacral regions which appeared to be muscular only. Later when seen by the writer he complained of nothing but weakness when stooping, no pain or difficulty in walking, no loss of sensation nor any apparent nerve lesions. When the case came into court, however, he had evidently been coached, as he then complained of great pain, loss of use of his right leg, curvature of the spine and in fact everything which would indicate a serious spinal injury. His physicians testified that they found an angular curvature in the lumbar region with contraction of the leg, etc. By order of the court we examined him carefully. Measurement showed no loss of substance in the leg as compared with the other. We placed him horizontally on his face and in a few minutes his leg became straight. On examining the spine, there was not the slightest deviation from normal. It was an evident case of malingering. The court also took this view and granted a non-suit.

With these exceptions all other cases reported as injuries of the back did not develop symptoms referable to lesions of the spinal cord. In cases 1 and 2, while there were marked symptoms of injury of the cord, recovery was as prompt and complete as could

be found in any other region or organ of the body, leading me to the conclusion that while injuries in this region may effect the cord, unless there be some prior disease or tendency thereto, we need not anticipate permanent injury.

All court records with the subsequent history of the patient will bear out the above conclusion, and I am fortified in my belief by discussing this subject with anti-corporation attorneys. It has not fallen under my observation to see a case of railway spine, yet there may possibly be such a condition, or rather an imaginary condition while the claim is being prosecuted, which disappears as soon as the judgment is paid.

I find attorneys out of court agree that so-called railway spine is a humbug, and notably in one case in which a prosecution was brought for an alleged injury of this nature caused by the derailing of a sleeping car. The attorney confessed to me that he did not believe that the woman was hurt at all, but said that she was diseased, of bad character generally, and he could bring his action best for spinal disease. He said if he had a similar case again he would set up some such state of affairs as this, that she was in such a condition of health that a shock or fright, or similar disturbances would destroy the general equilibrium and cause incurable disease, but under no circumstances would he ever bring suit for railway spine again. I am satisfied that in healthy systems an injury to the spinal cord will cause one of two conditions, either immediate marked symptoms, from which recovery is likely to occur, or when the cord is destroyed, permanent but immediate loss of function of all parts below the point of injury. I do not think in a healthy system the concussion to this region is more likely to produce permanent injury than will a simple uncomplicated fracture cause permanent loss of function of a limb.

MASTOID DISEASES.

Read at the Second Annual Meeting of the American Academy of Railway Surgeons held at Chicago, Ill., Sept. 25-27, 1895.

BY A. D. BEVAN, M.D.

CHIEF SURGEON IOWA CENTRAL RAILWAY.
CHICAGO.

I do not know of any other field of surgical work which involves such a thorough knowledge of the parts involved as mastoid diseases and its resulting complications. I would say that I have here a number of specimens selected from a lot of work which I did during last winter; I operated on thirty-five cadavers, made seventy operations on both sides of each cadaver in this line of work, to determine some of the points in regard to the anatomy, especially the position of the facial nerve with relation to the sub-medial triangle, and to demonstrate the best method of entering the temporal bone and the cerebellum and the sigmoid portion of the sinus.

From experimental work which I did, following very closely in the line of Macewen and Kerner, I determined the points which are practically laid down by Macewen in regard to the opening of the mastoid antrum. The key to the entire situation is the mastoid antrum, and a successful opening of the mastoid antrum can always be made if we adopt and follow these simple rules. If we examine the skull carefully we shall find immediately behind the temporal ridge the posterior border of the zygoma, a ridge running into the temporal ridge. This ridge is the upper line