

TRANSACTIONS OF THE PHILADELPHIA ACADEMY OF SURGERY.

Stated Meeting, February 6, 1899.

The President, J. EWING MEARS, M.D., in the Chair.

SUPPURATIVE CYSTIC THYROID TUMOR.

DR. THOMAS G. MORTON presented a woman, thirty years of age, who was recently admitted to the Pennsylvania Hospital, with a greatly enlarged thyroid tumor, suffering from dyspnoea, serious pressure symptoms, and great exhaustion. An incision was promptly made on the left side of the tumor, where the distention seemed to be the greatest. At some considerable depth an abscess cavity was reached; a trochar was thrust through the centre of the tumor to the opposite side of the neck, and, through the cannula, a rubber drainage-tube was passed. Rapid subsidence of the symptoms followed, with gradual diminution of the tumor. The drainage-tube had not been disturbed, but would be allowed to remain until the tumor was practically absorbed. In the reporter's opinion, in treating such degenerative cysts, it was safer to favor their cure by incision and drainage rather than to attempt more radical procedures.

EXCISION OF ASTRAGALUS FOR TALIPES EQUINO- VARUS.

DR. MORTON presented several cases of club-foot, saying that some years ago he had brought before the Fellows of the academy a number of patients from whom he had excised the astragalus for congenital club-foot of the equino-varus variety; the question was then raised, whether or not, in time, ankylosis of the joint would result from this procedure? and the promise was made that, from time to time, the patients would be exhibited

for further examination. This had been done on several occasions, and now he presented still other cases. He stated that, after a large experience, in no instance had such ankylosis occurred, but good ankle motion had been secured.

He recognized in equino-varus two forms, one the *uncomplicated*, the other the *complicated* club-foot; in the former the deformity is due to contraction of tendons and soft parts without displacement of the bones of the tarsus; such cases are corrected by tenotomy, stretching, massage, and apparatus. The other, or the complicated, variety is always associated with displacement, partial or complete, of the astragalus. This bone has been invariably forced forward and out of its normal position; indeed the tibia, in some instances, is found articulating with the os calcis. The astragalus will in such a case be found quite subcutaneous and in advance of the tibia. While it remains in that position it prevents flexion of the foot; it is an obstacle to the foot being brought into a proper normal position. The astragalus, furthermore, becomes so changed in form that it could not perform its normal function in the articulation, even if it could be restored to its usual position. Several years ago he sent two specimens, taken from such cases in his operations, to the late Professor Joseph Leidy, who in reply wrote him as follows:

"The two specimens of bone, submitted to my examination a few days since, are so altered from the normal form that I utterly failed to recognize them as being the astragalus."

It is quite easy to determine the presence of a displaced astragalus, first, from the fact that the foot cannot be made to assume a right-angle position with the leg, and, secondly, it can be readily felt as a subcutaneous, irregular, bony mass anterior to the tibia.

In operating for excision of the astragalus, it is important to first perform very general tenotomy. This consists in dividing the flexor tendon of each toe (a most important part of the operation), the tendo Achillis, and the tendon of the anterior tibial (if found contracted). For the excision of the astragalus, the incision should extend in a straight or slightly curved line from the base of the fourth toe, over the most prominent portion of the astragalus, to the external malleolus. Then the knife is readily carried around the circumference of the bone, and all attachments are divided, and it can be removed with a curved scissors

and a bone-forceps. If there still remain any difficulty in placing the foot in a normal, right-angle position, the cause will be found in the cuboid, or other tarsal bone, and the bone in whole or part, in such case, should be removed. It is seldom that any ligature is required, and drainage will occur through the spaces between the interrupted sutures.

He exhibited two cases of congenital equino-varus (complicated, double), for which he had done an excision of the astragalus and cuboid.

CASE I.—A boy, W. S., aged fourteen, who was admitted to the Orthopædic Hospital in March, 1890. He then did an excision of astragalus and cuboid in each foot, after tenotomy of flexors of toes, and the tendons of the anterior tibial, and tendo Achillis. He has now normal flexion and extension of the foot and perfect position. He wore a brace for a very short time, a few months only.

CASE II.—A. M., aged twelve, who was admitted to the Orthopædic Hospital, November 10, 1898, with complicated congenital equino-varus. The limb was considerably atrophied, foot greatly deformed, and he walked on the cuboid. One week after admission the anterior tibial tendon, the tendo Achillis, and the toe flexors were divided; after which the astragalus, cuboid, and a portion of scaphoid were excised. The foot could then be placed in an easy, normal position. An excellent recovery has followed, with a useful foot and fair ankle motion.

COMPOUND DISLOCATION OF THE ANKLE-JOINT.

DR. MORTON presented a man, forty years of age, who, on November 19, 1898, fell into a cellar, which was some eight feet in depth, and received a serious injury of the ankle-joint. The lower end of the tibia was found protruding through a rent in the skin, where it was tightly held. On the same day, when a free vertical incision was made, the articular tibial surface was found detached, and in fragments was removed; the lower end of the fibula was also comminuted, fragments small, which were removed. The irregular lower end of the tibia was then divided transversely.

The injured (entire) upper surface of the astragalus was likewise removed with chisel, and this bone and the tibia were then united by silver wire.

Immediate union followed without any suppuration. In such a case as this, before the days of present wound treatment, the only operation to be considered would have been amputation.

Contrary to expectation, there has resulted excellent ankle motion, while the contour of the ankle is perfect. An apparatus is still worn to give greater security in walking.

DR. WHARTON remarked that when attempts were made to save these cases before the adoption of present methods of wound treatment, amputation usually followed in a few weeks. Diffused abscess often developed, involving the whole leg, or pyæmia or septicæmia, and death often resulted. The result in Dr. Morton's case is most satisfactory. In a similar case—that of a man who jumped off of an engine, sustaining a fracture of the fibula and a compound dislocation of the lower end of the tibia—he excised the lower end of the tibia, and removed all loose fragments; put up in pasteboards for a few days, and then put on plaster-of-Paris dressings. This man obtained a very useful limb. It is now over a year since the operation was done, and he is walking quite well.

DR. R. HARTE said that he recalled a case almost similar, which he had in St. Mary's Hospital, five or six years ago. When he saw the case it was in pretty poor shape, and he suggested the possibility of resection and taking out the lower end of the leg bones, which he did, and then wired. Although the case was more or less septic at that time, with a large abscess in the leg, he succeeded in getting a very satisfactory result. He saw the man some years afterwards; he was then able to do the ordinary work of a house-carpenter.

FLAT FOOT.

DR. MORTON then presented a case of flat foot, which had been treated by Gifford's spring, for the purpose of calling attention to that ingenious apparatus, worn inside the shoe, which he thought to be far superior to any other form of apparatus. The patient, a man thirty-two years of age, had suffered for more than two years, but had found entire relief since using this spring-sole in his shoe. The apparatus consists of two pieces of steel held together by a hinge on one side, and between the two is a piece of soft rubber. It is placed in the shoe on the inner side and forms an artificial arch, the rubber holding the plates apart, and the plates yielding with the weight of the body.

FRACTURE OF THE FIFTH CERVICAL VERTEBRA.

DR. T. G. MORTON reported the following case: On December 27, 1898, a man, aged thirty-five years, received an injury to his head as the result of a dive in shallow water, while in Jamaica, West Indies. There was no loss of consciousness at the time, but the patient was much excited, and believed that his neck was broken. There was loss of motion and sensation in the trunk and limbs. His temperature was below normal immediately after the injury (97° F.), but some twelve hours later it had risen to 107° ; this, however, was reduced by cold applications to 102° . His condition the following day was somewhat improved, he could move his head and arms and the muscles of his abdomen. The legs were motionless. There was involuntary urination, but he retained control over the bowels. The area of anæsthesia had for its upper border a line extending nearly horizontally around the trunk, just below the nipples. His mind was clear and disposition cheerful. It was believed by his medical attendants that he was suffering principally from heat-stroke and cerebral concussion. He was sent North on a fruit vessel, and was admitted, immediately after his arrival, January 10, 1899, into the Pennsylvania Hospital. Upon admission his temperature was normal, mind clear and cheerful. Sensation was impaired at nipple line, but normal a few inches above. Pupils equal and normally reacting. He could move his head and arms, but there was complete paralysis and anæsthesia of lower half of the trunk and lower limbs. All reflexes in lower limbs lost. Urine drawn by catheter, bowels moved by enema. Temperature 102° on the evening of admission. The urine contained a small amount of albumen, but no sugar. On the 13th, after consultation of the staff, it was decided that there had been an injury of the spine at or near the sixth cervical vertebra, and it was decided to operate. On the following day, under ether anæsthesia, Dr. Morton exposed the cervical vertebræ from the third to the seventh. The laminæ of the fifth were found to have been fractured, and they (with the spinous process) were removed by catching them with the forceps and cutting all attachments. The membranes were not opened, but appeared to be healthy, and when a weak faradic current was applied to the exposed surface, the other pole being on the left foot, decided muscular contractions were observed.

Respirations appeared to be better after the pieces of bone had been removed. The temperature went up in the evening to 104°, but was reduced by cold sponging.

Two days later the patient seemed to be in an improved condition. The pulse was good. He had some twitching of the muscles of the legs during the night. Bowels loose and involuntarily evacuated. The temperature was still elevated (about 104° F.). On the 18th it was noted that there was more movement of the muscles, which react to the electrical current. Sensation still lost and impressions referred to the neck. January 26, the patient spoke of feeling peculiar sensations in his legs. Anæsthesia unchanged, but motion in response to current was improving daily. Patient still had elevated temperature and had lost flesh. The emaciation continued and the strength failed, a large bed-sore formed over the sacrum and spine, which became gangrenous. Death from exhaustion occurred February 4, 1899, his temperature shortly before death was 108°.

At the autopsy the spinal cord was found to be much softened and degenerated at the level of the fifth and sixth cervical vertebræ; the remainder of the cord appeared to be healthy.

At the time of the operation the dura mater, at the bottom of the wound, seemed to be healthy, and it was not disturbed. The wound had contracted, and in large part had healed by first intention shortly after the operation.

DR. HOLMES recounted a similar injury, which had occurred under his observation some years ago, from diving into a shallow public bath. The patient lived two weeks, and died of the injury to the spinal cord. Recently, during his hospital service, a man was brought in who had fallen from the third story of a building and injured his cord, but there was no mark of external injury whatever. By careful examination it was determined that the injury was about the outlet of the fourth cervical nerve, causing paralysis of motion and sensation. Friends would not allow any operation, and the man died in the course of ten days; no autopsy was permitted.

DR. BURR said that there died, last summer, in Blockley Hospital, a man who had been treated by Dr. Morton some twenty years ago, at which time he had a fracture of the cervical spine,—cause unknown. He was paralyzed entirely in his limbs when sent to the hospital. When he came to Blockley, three

years ago,—this was some seventeen years after the injury,—he was able to walk and to use his arms. He had marked spasm in both legs; some slight trouble in passing water; marked rigidity in the neck, and some wasting about the back of the neck,—muscular wasting. He stayed in Blockley on account of Bright's disease, not on account of his fracture; he used to work in the wards, but finally died. At the post-mortem it was shown that one of the cervical vertebræ was locked over the one above; it had slipped over. The spinal cord was remarkably flattened; it was only about one-half as thick and as wide as it ought to have been. Still it had performed almost all the functions that it could have performed if perfectly normal.

DR. MORTON remarked that in this case the injury occurred in the spring of 1876, during the time of the Centennial Exhibition. While polishing the marble columns in front of the mint, the man fell from a scaffolding and struck his head.

DR. DEEVER said that he had seen a number of fractures of the vertebræ, in some of which he had done the operation of laminectomy. While it has not been attended by success, yet he felt it to be a perfectly warrantable procedure, as he had never known a patient to die from shock in his own personal experience. In the case of a man in the German Hospital, who met with a fracture of the upper thoracic vertebra, as demonstrated not only by palpation but by an X-ray picture, and was paralyzed, laminectomy was suggested, but was not accepted by Dr. Deaver. For several weeks he was completely paralyzed. But now he sits up; has perfect control of his arms; some little control of his legs, and control of his bladder. With that sort of experience—having had experiences not so favorable as that from operation—it makes one hesitate about doing an operation. He believed laminectomy to be a proper procedure; but that it promises most as an early operation,—that is, done immediately and not ultimately. Most of these injuries occur from extreme flexion of the spinal column. Such cases are not likely to give good results. In cases of direct traumatism, as the one Dr. Morton reported, operation would be more promising.

DR. HARTE agreed with Dr. Deaver that the time to operate on spinal injuries is in the beginning instead of waiting until some time had elapsed. He had done the operation of exposing the cord, for the relief of supposed pressure in the upper region of

the neck, twice in the last few years, but with unfavorable termination. Such cases all die in a very short time. But if surgeons could succeed in saving or restoring the function in one out of fifty cases, it would make the operation justifiable. Personally he was inclined to pursue a conservative course. Fractures of the cervical vertebræ are known to be extremely dangerous,—that is to say, the patients die very frequently within forty-eight hours or three days; very seldom they recover. The advisability of laminectomy increases as one descends the spine.

DR. WHARTON said that he had seen some operations of laminectomy for fracture in the cervical and also in the dorsal region, some undertaken early and some in which the operation was delayed several weeks, but in none of these cases had he observed decided improvement follow. In most of these cases it was found that the cord practically had been torn at the time of injury; the injury being produced by falls on the head or buttocks, causing violent flexion of the spine and rupture of the cord. He had seen a few cases in which conservative treatment was followed by good results. In one case a man was caught under a trolley-car and had a fracture in the second lumbar vertebra; this case recovered with apparently perfect motion; he had really very little paralysis at the time of admission. He has at the present time a little anæsthesia at the anterior portion of each thigh, rigidity, and distinct deformity in the seat of fracture, but, with these exceptions, he is in good condition.

DR. T. R. NEILSON had had experience with two or three cases of laminectomy. One was in a case of high lumbar fracture, another was middorsal, and the third was also dorsal. So far as the operation is concerned, his experience in these three cases quite agreed with that of the other speakers. He saw no immediate ill effects of the operation, and he did not think that under ordinary circumstances, certainly below the cervical region, the element of shock need be considered, on account of the great difficulty of diagnosis, in some cases, of spinal injury. If there is plausible reason to believe that there is fracture with displacement, then he saw no objection, and in some cases thought there was very distinct indication for laminectomy to be performed, but the great trouble is to determine what the lesion is that is to be dealt with. In the three cases that he had seen, the destruction of the cord was so great, so complete, that the operation

might just as well have been left undone, so far as the ultimate results were concerned. On the other hand, he had seen, like others, fracture of the spine, in which very fair ultimate results were obtained without operation, the patient living for a number of years, gradually recovering after many weeks or months following the injury, with more or less control of certain groups of muscles, perhaps all in a given limb or area. He recalled a case, in his wards at the Episcopal Hospital, of a young man about twenty, who had sustained an injury in the cervical region while wrestling. He was violently thrown in some way. There was paralysis from the clavicle downward, but he could detect no displacement. So he simply left the patient to take his course, watching him carefully, and using such medicinal treatment as was indicated to meet individual symptoms. The man recovered completely within a reasonable length of time, getting perfectly and absolutely well. He knew of cases, on the other hand, where an operation was done for just exactly such symptoms, and where the cord was found injured beyond all hope of repair. It is often impossible to know how extensive the injury is without exposing the site, and, therefore, the question is not merely how to operate or to determine the element of danger, but how to reach an accurate diagnosis.

DR. J. EWING MEARS detailed the case of a woman, who was admitted to the surgical wards of St. Mary's Hospital, suffering from an injury of the vertebral column, caused by a fall from the second story of her house. In this fall her back came in contact with a corner of the stone step in front of the house, which resulted in producing a fracture of the last dorsal and the first lumbar vertebræ. On examination, it was found that the patient was suffering from paraplegia as a result of the injury. Some days after her admission he performed laminectomy. Subsequent to the operation the patient showed marked symptoms of improvement, then he lost sight of the case.

He believed it was not only justifiable, but incumbent upon surgeons to interfere in these cases. Relief afforded to one patient is encouraging, and should induce surgeons to operate in all cases where possibly relief may be afforded. It is impossible to determine, of course, the exact extent of the lesions which may exist without such an inspection as an operation will afford. As has been stated, the operation *per se* is quite

devoid of danger, and therefore the patient is not subjected to very grave additional conditions. By repeated operations our knowledge will be increased, both with regard to diagnosis and the results of treatment.

DIFFERENTIATION OF VERTEBRAL SYPHILIS FROM POTT'S DISEASE OF THE SPINE.

DR. CHARLES W. BURR reported the following case: A single man, thirty-one years old, was admitted to the Philadelphia Hospital, August 3, 1896, complaining of loss of power in the arms and legs. He at first denied and later admitted having had syphilis. Five years before his admission to the hospital he fell from a low scaffold, striking the back and occiput. He was confined to bed five weeks on account of injuries to the chest, but had no paralytic or other spinal symptoms. One year later he was caught between two cars, bruising the chest and back, but was absent from his work only a few days. He continued in good health until the onset of his present trouble, in October, 1895. At that time his neck began to be stiff and his head became forcibly retracted. By December he was unable to move the rigidly retracted head at all. In May, 1896, he gradually began to lose power in the left arm, left leg, right arm, and right leg in the order named. He never had severe pain in the spine or extremities. For several months he has had difficulty in micturition, and frequently uses a catheter.

Examination showed complete loss of power in both upper arms, with some slight retention of movement in the forearms. He can flex and extend the legs while in bed, but can scarcely stand alone, and even when supported can walk only a few steps. The legs are stiff from extensor spasm and voluntary or passive movement makes them more so. The hands are contracted, the first phalanges being hyperextended, the others flexed. He can flex and extend the head a little, but cannot rotate it, apparently not because of palsy or spasm, but on account of a mechanical resistance to the movement. It is no longer retracted, but sits upright upon the neck. The back of the neck is full and rounded, and a firm, ill-defined, not very painful mass is present over and on either side of the cervical vertebræ. The skin is movable over it, but it seems to be attached to the bones beneath. Though there is ordinarily little pain in it, pressure upon it causes

great suffering. The pharynx is normal. There is no evidence of bone-disease in its posterior wall. The cervical glands are enlarged. The knee-jerks are very much increased, ankle clonus is present, and the biceps-tendon jerk is active on both sides. The muscle-jerks are present in the arms and legs, but much more marked in the latter. Tactile sensibility is preserved over the entire body. There are some spots of hyperæsthesia upon the legs, the position of which shifts from day to day. There is considerable disturbance of the temperature sense, his replies when touched with a warm or cold object being incorrect almost as often as they are correct. He apparently has no true appreciation of temperature. He complains—and this has been for several months, but after the onset of the palsy—of pricking and tingling sensations in the arms and in the legs below the knees. There is marked wasting of the muscles of the hands and forearms, none of the upper arms or legs. There are no cranial nerve palsies. The pupils are equal, moderate in size, and react well to light and with accommodation. He has great difficulty in passing water and is obstinately constipated. The thoracic and abdominal organs are normal. There is some cystitis; a little pus, a trace of albumen, but no casts in the urine. Upon the legs are syphilitic scars. He had no fever while in the hospital.

He was kept upon his back and given iodide of potassium and mercury, both of which he bore well. After several months he had improved so much that he was permitted to go out on parole. He did not return. The deformity of the spine had disappeared. He could walk well and use his hands fairly well. The deep reflexes were still increased, and there was still some wasting in the hands and forearms. He could micturate without trouble.

Part of the diagnosis was easy enough. He evidently had a cervical meningomyelitis. The combination of irritative and destructive symptoms proved this. The onset with retrocœlic spasm, followed by a wasting palsy of the arms, and a spastic palsy of the legs were enough to localize the lesion in the cervical region of the cord. The more important part of the diagnosis—namely, the primary cause of the nervous symptoms—was more difficult. The diagnosis of syphilis was made, not upon the nervous symptoms; it was only in small degree a conclusion

drawn from the results of physical examination, it was largely a happy guess based upon the history of a previous syphilitic infection. The mass in the cervical region was assumed rather than proved to be a gumma. The assumption turned out to be well founded and right. It might have been wrong. Only the course of events proved that it was not a malignant growth or inflammatory from tuberculosis.

Dr. Burr further remarked that to determine whether any given case of compression myelitis is tubercular or syphilitic is easy or difficult according to circumstances. In those cases in which a well-defined gummatous growth is visible and palpable, there need be no difficulty. In other cases, in which a syphilitic exostosis grows into the spinal canal and encroaches upon the cord, diagnosis may be impossible. In the very rare cases of syphilitic caries of the bodies of the vertebræ the bony deformity and the nervous symptoms may exactly simulate tubercular caries. There is no reason why they should not, for the nervous symptoms of Pott's disease are due largely to the meningitis which, in its turn, causes a myelitis, and it matters very little whether the irritation causing the meningitis is syphilitic or tubercular. Again, the bony deformity is a mechanical thing depending not at all upon the pathologic nature of the caries.

We are driven, then, to other grounds entirely upon which to base a diagnosis. Zasinski, who has collected quite a large number of cases of all types of syphilitic vertebral disease, concludes that primary bone tuberculosis does not occur in the adult, hence, if in an adult he finds angular deformity or other sign of Pott's disease without evidence of visceral tuberculosis, he assumes syphilis or a tumor. If he finds evidence of syphilis in other parts of the body, he excludes new growth. In any event, he employs the therapeutic test. Leyden lays stress upon the fact that syphilitic vertebral disease may have more than one primary focus, whereas tuberculosis is never multiple in the spine. The mode of onset and course of the nervous symptoms may be of some diagnostic value. Tubercular caries almost always begins in the bodies or intervertebral disks, whereas syphilis may begin anywhere, in the periosteum or in any part of the bones. It follows that the early nervous symptoms of tubercular disease are always or almost always dependent upon disease of the anterior part of the cord, are motor, and that though they may first

appear in one extremity they soon become symmetrical, whereas in syphilis any part of the periphery of the cord may be first affected, and if the lesion be a gumma or periostitis instead of caries of the bodies, the symptoms may be asymmetrical and aberrant for some time. Thus, in the case reported, palsy first appeared in one arm, then in the leg of the same side, then in the other arm, and last in the other leg. This would be a very unusual course in tubercular disease.

(1) Two days after the date of the foregoing remarks a patient, who had had a spastic paraplegia for many months, died, and a necropsy was made. He was about sixty years old. He had had a slowly on-coming spastic palsy of both legs with increase of the knee-jerks, ankle clonus and retention of urine, without anæsthesia. There was no deformity of the spine and no localized pain. Post-mortem the spinal dura was found thickened by inflammatory tissue on its outer surface, in the region of the tenth dorsal vertebra. It was somewhat adherent to the body of the vertebra. There was no inflammation of its inner surface, and the pia was not thicker than normal and was transparent. The vertebral body was somewhat carious, but not enough so to disturb its form. Macroscopically the cord seemed normal. There has not yet been time to make a microscopic examination of it. There were no evidences of tubercular or syphilitic disease in the thoracic or abdominal viscera. Death resulted from chronic nephritis. It seemed to Dr. Burr that the caries was tubercular, was primary in the spine, and hence is strong evidence against the opinion quoted above.

DR. G. G. DAVIS said that he was positive that he had seen primary tubercular disease of the bones of the spine in adults, and he would be unwilling to accept that as a diagnostic point,—that is to say, the occurrence of kyphosis in an adult without tubercular disease elsewhere as being proof of syphilitic disease of the spine. He certainly thought that in adults, in just the same way as in children, but not so frequently, tubercular disease of the bones of the spine develops, following, for instance, slight injuries, and they show a marked kyphosis.

DR. WILLIAM J. TAYLOR stated that he had had rather a large experience in these cases of spinal disease, and that he could only recall one instance where syphilitis could be considered as a probable cause. This was in a child of three, with a distinct

history of inherited syphilis, and an acute Pott's disease as well, but it was also impossible to eliminate entirely the question of tuberculosis. He had seen several instances of primary tuberculosis of the spine in adults where the possibility of a syphilitic taint could be thoroughly excluded.

BACKWARD LUXATION OF THE ASTRAGALUS AT THE ANKLE-JOINT.

DR. W. B. HOPKINS presented a man, aged thirty-five years, who was brought to the Pennsylvania Hospital, December 22, 1898, for an injury received by being caught in shafting while attempting to slip a belting on a wheel. Besides a severe laceration of the scrotum, which laid bare the tunica vaginalis and the sac of an inguinal hernia, he had sustained a dislocation at the ankle.

The foot was inverted to nearly a right angle. The anterior border of the articular surface of the tibia could be plainly seen beneath the skin, while the trochlea of the astragalus could be felt behind the ankle-joint. A plaster cast was at once taken of the injured parts. (Fig. 1.) Reduction was accomplished unintentionally by simply lifting the foot from the table by the toes, while in the act of cleansing it. The luxation could, however, be reproduced without effort at will by gently forcing the foot backward. In studying the deformity consequent upon this dislocation, it is interesting to note that the marked inversion of the foot is caused by the tibia resting upon the slanting plane of the tarsus, corresponding to the upper surfaces of the neck of the scaphoid. As can be readily demonstrated upon the skeleton, this is the point on which the tibia would naturally rest in occupying its new position.

The limb was placed in a fixed dressing, which was removed in five weeks. The patient never had any pain or discomfort from the luxation, his convalescence being entirely uneventful, but his scrotum suppurated, and now, at seven weeks, is not entirely healed, though he walks on his injured foot with ease.

DR. DE FOREST WILLARD remarked that he had seen no cases of simple dislocation of the astragalus from the calcaneum, but he had seen a number of compound luxations with and without fracture, where it was necessary to excise a whole or a

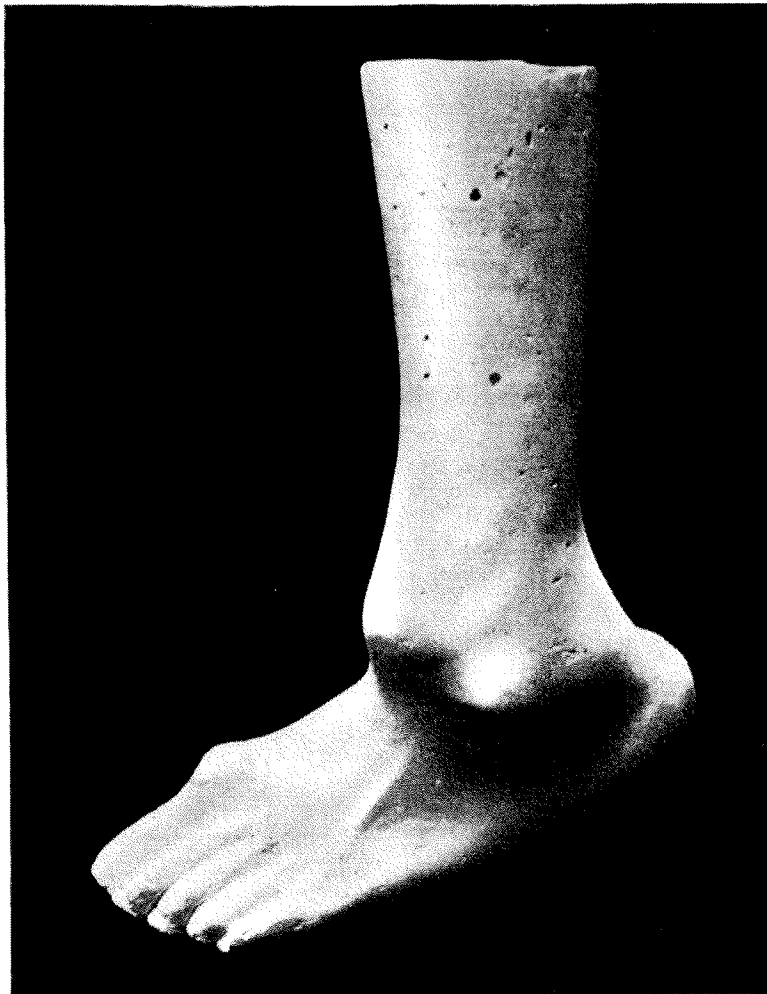


FIG. 1.—Showing deformity after dislocation of the astragalus at the ankle-joint.

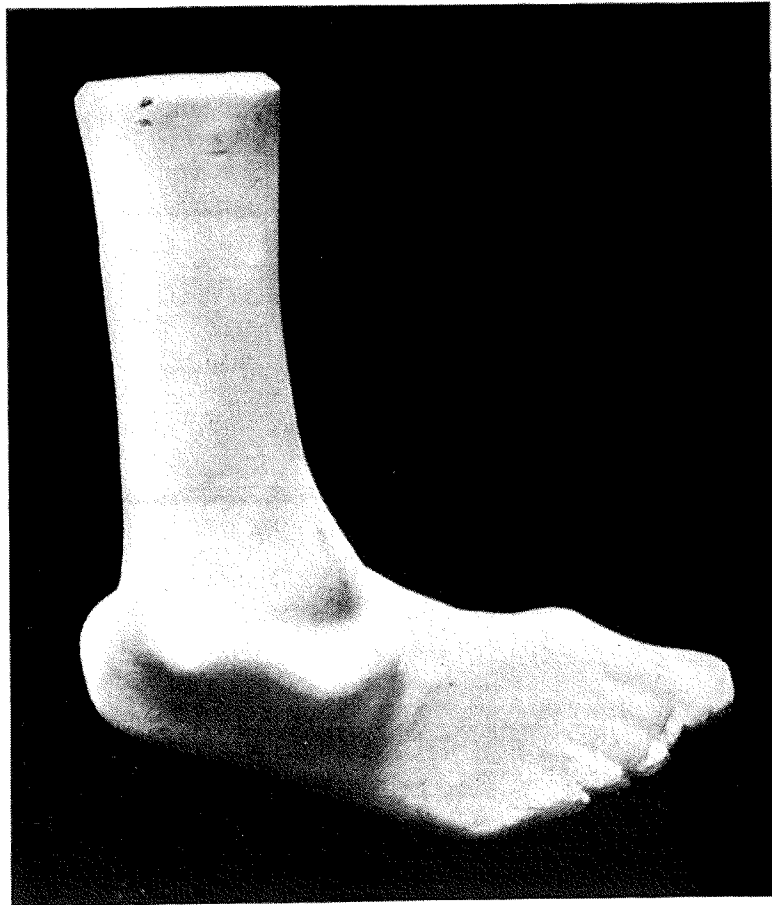


FIG. 2.—Showing deformity after dislocation of the os calcis and scaphoid from the astragalus.

portion of the astragalus. Where the astragalus has been removed the results of motion at the ankle-joint are better than where it has been allowed to remain. The articulating face of the calcaneus coming up against the articulating face of the tibia makes a very good ankle-joint afterwards, consequently, in a case of compound dislocation, accompanied by fracture, removal is a desirable procedure.

DISLOCATION OF THE OS CALCIS AND SCAPHOID FROM THE ASTRAGALUS.

DR. W. B. HOPKINS presented a plaster cast of a foot and ankle in which a dislocation of the os calcis and scaphoid from the astragalus had occurred. He said that in describing dislocations it is on some accounts unfortunate that no fixed rule has ever been consistently adhered to, in naming the proximal or distal bone contributing to the displacement, as the bone dislocated. While the dislocation of any joint is more commonly named by the distal bone, such a definition is at times awkward and misleading. Thus to call an upward luxation of the acromial end of the clavicle a downward luxation of the scapula might readily be misunderstood, while in the dislocations about to be reported, the joint dislocated must be carefully specified in order to avoid confusion. An injury was described as above by Mr. George Pollock in a paper read before the Royal Medical and Chirurgical Society of London, entitled "Dislocation of the Os Calcis and Scaphoid from the Astragalus." While in this manner the injury is distinctly located, such a heading would easily escape observation in looking up references for a collection of data. As this latter consideration is very important in the titles of all subjects, to follow usage, without aiming at entire consistency, is perhaps the best alternative.

The case from which the plaster cast was taken (the man having been a patient of the Pennsylvania Hospital while the reporter was resident surgeon) has a history as follows:

J. D., aged thirty-six, a powerfully built, healthy man, while lowering a barrel of shellac from his wagon lost control of it, and rolling down the plank it struck both of his legs in front with great force. He had a compound fracture of his left leg. There was found great deformity of the right foot, consisting in a marked prominence about an inch and a half in front of the ex-

ternal malleolus, over which the skin was tightly drawn and which was easily distinguished as the smooth head of the astragalus. The foot was markedly inverted, but the contour of its plantar aspect was normal. The patient was etherized and the plaster-of-Paris cast (Fig. 2) was expeditiously taken. A more careful examination verified the diagnosis, showing the astragalus normally articulated at the ankle, but dislocated outward from the os calcis and scaphoid. There was no fracture. The dislocation was easily reduced by forcible eversion of the foot and counterpressure with the thumbs upon the head of the astragalus. Both limbs were placed in a fracture-box, a fixed dressing being applied later on to the right foot.

A second case was admitted to the Episcopal Hospital in 1894. A man, aged forty-eight, had fallen from the rigging of a vessel to the deck, a distance of thirty feet, and had landed on his feet. The same deformity of the left foot as in that of the other case was observed, except that the head of the astragalus was not quite so prominent, nor was the inversion of the foot so complete. The articulation of the astragalus at the ankle-joint was undisturbed, and there was no fracture. The patient was etherized, and the dislocation reduced as in the other case, and with as little difficulty. A plaster-of-Paris dressing was applied. The patient made a good recovery.

Although in the paper by Mr. George Pollock, above referred to, thirty-two simple dislocations of this articulation of the astragalus have been collected, the injury is certainly a very rare one. Its occurrence depends upon the action of forces similar to, if not identical with, those causing the various fractures about the ankle-joint, which are among the most common of fractures of the lower extremity. The reduction, as stated in the two cases reported, was very easy, which would appear to be the exception and altogether contrary to the experience in most cases. An analysis of Mr. Pollock's table—that part of it relating to simple luxations—sufficiently demonstrates the extreme gravity of the injury. Six died, one recovered after amputation, three recovered after resection of the astragalus, eight recovered after unsuccessful efforts to reduce it, in one case the result was uncertain, and thirteen recovered after reduction. In his whole list, which includes compound as well as simple dislocations, of which fifty-five are tabulated, the results are not encouraging. The total number of reductions being only eighteen.



Bony pelvis prepared to illustrate case of sacro-iliac dislocation.



COMPLETE SINGLE SACRO-ILIAC DISLOCATION.

By WILLIAM BARTON HOPKINS, M.D.

H. F., aged eighteen years, was admitted to the Pennsylvania Hospital December 23, 1898, having been caught in an elevator. The patient on admission showed considerable shock. The expression of the lower extremities suggested the existence of luxation of the femur upon the dorsum of the ilium, as the left limb was shortened and the foot everted, as in "everted dorsal dislocations." Examination of the hip-joint, however, showed it to be unhurt. Turning the patient upon his right side, the left ilium was found to entirely overlap the sacrum, so much so, that the tips of the fingers could be insinuated beneath it, as they can beneath a scapula. Exploration was then made for the other point, which had yielded to allow of this break in the pelvic ring. As was expected, it was found at the symphysis pubis. The joint was quite mobile, the mobility being easily discernible by pressure upon the anterior processes of the ilium. The left limb was shortened because the ilium had risen above its normal position, and the limb was everted because the ilium in riding over the dorsum of the sacrum had altered correspondingly the direction of the acetabulum. (The deformity as it existed is graphically demonstrated in the accompanying illustration.) A deep right-angled contusion of the integument over the left side of the sacrum testified to the violence of the forward pressure which had caused the dislocation. There was no paralysis, nor was there evidence of concealed hæmorrhage of any severity. The patient was etherized after recovering somewhat from the shock, with the view of attempting to reduce the dislocation. The indications to accomplish this result were recognized to be forward extension of the ilium and counter-extension backward of the sacrum. Traction upon the glenoid cavity conveyed through the left thigh, flexed at a right angle with the long axis of the body, was decided upon as the most effective forward extension of the

ilium. For the backward counter-extension of the sacrum the natural procedure of placing the operator's foot upon the abdomen, at a point corresponding to the promontory of the sacrum for counter-extension, was not available here, lest further mischief should be done to the already damaged pelvic contents. Backward counter-extension of the sacrum was therefore obtained through the spine and right glenoid cavity. Through the spine by looping a sheet around the abdomen and tying it to the edge of the bedstead, and through the glenoid cavity by forcible counter-extension at the hands of two assistants. Two strong efforts accomplished the restoration, not absolutely, but so nearly that the edges of the sacrum and ilium were felt to abut against each other, and the deformity to be almost entirely overcome. It was decided that if the patient recovered, as no inconvenience whatever could result from the slight deficiency remaining in adjustment, it was more prudent to desist from a further effort. Patient was placed on his back, upon a hard mattress, with sand-bags at his hips and a compress beneath the left ilium. There was considerable abdominal tenderness, and tympany for one week, which then subsided. After this the patient showed no unfavorable symptoms. He was allowed to sit up in six weeks, and at the end of seven weeks walked with crutches. There was no tendency to recurrence of the dislocation, and the patient made a good recovery.

Harris (*North American Medical and Surgical Journal*, Philadelphia, 1827, Vol. iv, p. 77) mentions the case of a woman, thirty-five years of age, who had borne one child, where the injury was inflicted by a blow upon the sacrum from the clinched fist of her husband. A frail, delicate woman whose pelvic joints had presumably been weakened by pregnancy.

Dr. Gibson, who was called in consultation, found, upon examination, a considerable hollow over the upper part of the sacrum, produced by the unnatural backward projection of the posterior superior spinous process of the ilium. When the patient moved her right leg, an aggravation of the pain was experienced, accompanied by a distinct crepitation. The slightest motion conveyed an impression to her as if, to use her own language, her "hip-bones were separating."

Mr. Thorsby Jones (*British Medical Journal*, 1878, Vol. i, p. 5) reported a case of fatal injury from being struck by a locomotive engine, in which there was partial forward luxation of the sacrum from both ilia. In this case the patient died in seven hours. His notes of the autopsy being as follows:

“An extravasation of blood was found occupying the rectovesical pouch and the loose tissue around; and on dissecting through this, the ilio-lumbar artery, on the right side, was seen to be wounded. The veins on this side were unhurt; but on the left side the external iliac vein was wounded at a point opposite the left sacro-iliac articulation. On removing the rectum, bladder, the vessels, and loose tissue from the pelvis, it was at once seen that the sacrum was unusually prominent; and further examination showed that it was separated from its articulation with the ilium on each side. The anterior sacro-iliac ligament was ruptured,—all but a few of its fibres. The anterior border of the articulating surface of the sacrum was at least a quarter of an inch in front of that of the ilium on both sides. The posterior aspect of the articulation was then examined, and here the ligaments could not be well defined, on account of the laceration of the glutæus maximus and the extravasated blood. A careful examination was then made of the whole of the pelvis, and at no point was a fracture discovered.”

Dr. E. A. Lewis, of Brooklyn (*New York Medical Journal*, 1885, Vol. xlii, p. 715), reports a case of a man who, while riding on horseback, was unseated and came down astride of the withers of the horse. Though there were very painful symptoms pointing to injury of the sacro-iliac articulation, there was no external evidence of displacement. He reports a second case, also without deformity, which presented symptoms, nevertheless, of serious disturbance at this joint.

A case of so-called sprain of the sacro-iliac joint, caused by lifting, which was followed by abscess and death, in a tubercular subject, is mentioned in the report of the Marine Hospital service.

The case which I now report will be seen to differ essentially from any of those above mentioned. The important factor of deformity, the primarily essential feature of displacement at the sacro-iliac joint, has been so frequently wanting in cases which were presumed to be dislocations, that one recognizes a certain incredulity among authors, when speaking of supposed or unauthenticated cases of this injury; it is spoken of as a dislocation difficult to recognize. Not so in this case, as stated in the report, the fingers could be insinuated beneath the ilium as they can beneath the scapula of a thin and relaxed subject. The shortening of the limb on the injured side, which I believe was an inch, and its rotation outward, as in everted luxation of the femur upon the dorsum of the ilium, sufficiently proved the degree of overlapping of the sacrum by the ilium. The intense pain immediately after the receipt of such an injury, which has characterized other cases, was not observed in this case; probably owing to the patient's condition of shock. The intense pain observed for weeks after, on the slightest motion or change of position in bed, was perhaps avoided in this case by retaining the patient in a state of fixation; that there was no hæmorrhage nor paralysis fortunately prevented serious, if not fatal, complications. While not attempting, therefore, to have exhausted the literature of this very rare and interesting injury, I venture the opinion that it is the first case recorded of complete sacro-iliac dislocation occurring in a sound pelvis to recover after reduction.