

Mr. Erichson suggests also that, in case of a failure by the ordinary means, we should resort to a subcutaneous section of the tendo Achillis. Mr. Williams, of Dublin, in a similar case, which had been left unreduced, was obliged finally to extract the bone, in consequence of the integuments having sloughed.<sup>1</sup>

In February, 1875, Mr. J. N. Hall, of Colorado, æt. 38, consulted me in reference to an injury to his foot sustained two years before. The foot had been caught between a couple of timbers and violently twisted inwards. The nature of the accident was not at first recognized. I found the astragalus displaced backwards as far as the posterior extremity of the calcaneum, causing the tendo Achillis to curve backwards; the astragalus was especially prominent on the inner side, posteriorly. The foot was at a right angle with the leg, and shortened in front three-eighths of an inch. The leg was shortened five-eighths of an inch. The foot was at times painful and numb. He walked very well with the aid of a cane. Of course, no surgical interference could be recommended.

Compound dislocations, and such as are otherwise complicated, demand of the surgeon immediate amputation or exsection, the latter of which ought to be preferred whenever the condition of the limb encourages a reasonable hope that the foot may be saved.

Dr. Grant, of Canada, has reported a case of success after reduction of a compound dislocation of this bone. The man was 35 years old, and in good health. Immediately after the accident the astragalus was found completely dislocated forwards, and lying with its long axis placed transversely, so that the anterior extremity protruded through the integuments one inch on the outer side of the foot. There was no fracture. The first attempt at reduction, by extension and pressure, failed; but in the second attempt moderate pressure, without extension, was successful. Suppuration ensued, and continued two months. At the end of eight months he walked without a cane; and at the date of the report the ankle was in all respects perfect.<sup>2</sup>

"In the dislocation by rotation, or renversement," says M. E. Delorme, "if the bone has been rotated upon its antero-posterior axis to the extent of 90 degrees, thus having brought its trochlear surface inwards or outwards, it is necessary, in order to effect reduction, that while pulling on the foot, the bone should be tilted, outwards in inward dislocation, and inwards in the external variety, which is done by pressing upon the margin of the facet which has become superior. In a case of dislocation by renversement, the surgeon must try first, by a tilting motion, to convert that rotation of 180 degrees into one of 90; and then to press again upon one of the margins of the bone, in order to transform the displacement into an ordinary dislocation inwards or outwards."

When exsection is practised, and the bone is found to be broken, as it often is, all the fragments should be carefully removed, since they are certain to become necrosed if left in place. "This happened," Poincot remarks, "in the cases of Barton and Smith, and the accidents which occurred in Sampson's patient and in mine, seem to me to be due to the

<sup>1</sup> Williams, Erichsen, op. cit., p. 271.

<sup>2</sup> Grant, Canada Med. Journ., Oct. 1865.

fact that the extirpation had been incomplete." Nor ought the surgeon to hesitate to lay open freely the tissues in every direction, in order that he may accomplish this purpose; even the tendons lying over the protruding bone may be sacrificed unhesitatingly, since, after having been so severely bruised, stretched, and lacerated, they are pretty certain to slough. Indeed, the more freely the tissues are divided over the bone, the less will be the danger of inflammation, and the safer will be the life and limb of the patient.

In addition to the examples already cited of compound dislocation in which the astragalus was removed, the following, reported by Dr. W. A. Gillespie, of Ellisville, Va., will also illustrate the occasional value of exsection in these severe accidents.

Mrs. A., aged about 50 years, fell from a horse on the 23d of May, 1833, dislocating both ankles. The dislocation of the right foot was accompanied with a dislocation of the astragalus outwards, which projected through a very large wound in the integuments, and its trochlea was placed at an angle of about 45° with its natural position. Early on the following day it was removed by severing its few remaining connections, and the wound was immediately closed by stitches, adhesive plasters, and light dressings. From the moment of the receipt of the injury, and for several days afterwards, she suffered excruciating pain in the limb, and on the third day tetanus was apprehended, but its full accession was prevented by the free use of opiates. The limb was suspended in N. R. Smith's fracture-apparatus; and as gangrene with hectic fever soon threatened the life of the patient, fermenting poultices were diligently applied, and the patient was sustained by wine, bark, and other tonics. Two months after the injury was received, the date at which the report is given, the wound had entirely healed, and her complete recovery was regarded as certain.<sup>1</sup>

## § 2. Astragalo-Calcaneo-Scaphoid Dislocations.

It is perhaps quite as common for the astragalus to be dislocated from the scaphoid bone and calcaneum, while it retains its connections with the tibia, as to be dislocated from all these bones at the same time. This astragalo-calcaneo-scaphoid dislocation is that which Malgaigne has termed "subastragaloid." Produced by the same causes which determine true dislocations of the astragalus, it may occur in the same directions, and is liable to the same complications; nor will either the prognosis or treatment differ essentially from that which is recognized and established in the other accident.

As in dislocations proper of the astragalus, so also in this accident, opposite results have occasionally followed from similar modes of treatment. Thus, Dr. Detmold, of New York, stated in 1856 to the New York Academy of Medicine, that he had recently met with a dislocation of the astragalus, in which the bone had retained its proper relations with the tibia, but not with the bones of the tarsus. The patient had fallen from a wagon and caught his foot in the wheel. Dr. Detmold made

<sup>1</sup> Gillespie, Amer. Journ. Med. Sci., Aug. 1833, p. 552.

extension with pulleys, but could not effect the reduction. Subsequently he was obliged to remove the astragalus on account of the suppuration which followed and the consequent exposure of the bone. The wound did not heal kindly, and at length amputation of the leg became necessary.

Dr. Detmold concludes, from this example and others which have come to his knowledge, that if a similar case were to present itself to him again, he would amputate at once.<sup>1</sup>

The following case reported by Dr. Thomas Wells, of Columbia, S. C., is of unusual interest, as illustrating the danger of leaving the bone displaced, and also the benefit which may, even under the most unfavorable circumstances, result from its final removal:

Dr. S., æt. 30, was riding in an open carriage, some time during the year 1819, when his horses became frightened and ran, and in leaping from his vehicle he struck upon his left foot, dislocating the astragalus from its junction with the scaphoid bone, upwards and slightly outwards. Several medical gentlemen made violent efforts to reduce the bone, but without effect. Inflammation and suppuration, accompanied by a high fever, soon followed, and the head of the astragalus, becoming carious, protruded through the skin. On the 18th of August, about seven months after the injury was received, he was still suffering from a copious discharge, pain, swelling, and general irritative fever, and it was determined to excise the bone; which was accordingly done by enlarging the wound and detaching its loose connections with the adjacent tissues. The astragalus extracted left a frightful wound, the foot seeming to be nearly separated from the leg. A hollow splint was adjusted to the inside of the foot and leg, so as to preserve the limb perfectly steady and in a proper direction; simple dressings were applied, and an anodyne administered internally. No accidents followed, and at the end of September the wound was healed, and the swelling of the parts had entirely subsided. One year after the operation, he walked without the least difficulty; the ankle being then perfectly sound. The leg was shortened about one inch, and this deficiency was supplied by a thick heel upon his shoe.<sup>2</sup>

Examples might be cited illustrative of the value of early excision where reduction could not be accomplished; but, after what has already been said upon the subject of dislocations of the astragalus, I shall not regard any farther reference as either necessary or useful. If other principles of treatment are to govern the surgeon than those which I have already laid down, they cannot here be stated. They are among those unwritten rules whose existence we cannot always recognize until the case arises to which they may apply. Yet, in the exigency supposed, they are as clearly defined, and as imperative, in the mind of the clever surgeon, as any of those laws which have been made the subjects of special record.

<sup>1</sup> Detmold, New York Journ. Med., May, 1856, p. 383.

<sup>2</sup> Wells, Amer. Journ. Med. Sci., May, 1832, p. 21.

### § 3. Dislocations of the Calcaneum.

The calcaneum may, as a consequence of a fall upon the heel, or of a direct blow, be dislocated outwards from the astragalus alone, or upwards and outwards from the cuboid bone at the same time. It has been found also, according to Canton, at the same moment dislocated outwards from the astragalus and inwards upon the cuboid bone.

Chelius says he has seen an old dislocation of the calcaneum, produced in early life by pulling off a boot, from which there finally resulted a degeneration like elephantiasis of the leg, rendering amputation necessary.

Mr. South remarks, in his notes to Chelius, that the two cases of dislocation outwards of this bone, mentioned by Sir Astley Cooper, were from his (South's) Notes (cases 199 and 200). In the first case, that of Martin Bentley, occasioned by the falling of a heavy stone upon his foot, the integuments were not broken, and the position of the foot resembled a varus. "The dislocation was easily reduced, having bent the thigh and knee on the body and fixed the leg, by laying hold of the metatarsus and of the tuberosity of the heel-bone, and drawing the foot gently and directly from the leg, during which extension Cline put his knee against the outside of the joint, and the foot being pressed against it, the heel and the navicular bone readily slipped into their place, and the deformity disappeared." He was discharged from the hospital in five weeks, "having the complete use of his foot."

In the second case, the dislocation, produced also by the fall of a stone upon the foot, was compound, and the patient, Thomas Gilmore, having been brought into St. Thomas's Hospital, the reduction was effected by extending the foot and rotating it outwards. Six months after, when he left the hospital, he was able to walk pretty well with a stick.

A. Dumas<sup>2</sup> relates an example of this dislocation outwards, caused by a piece of wood falling upon the internal side of the leg and foot. Jourdan, of Marseilles, in whose service the case was presented, reduced it easily by extension downwards and outwards, combined with direct pressure.

In another case reported by Dumas, a man had been struck upon the posterior and external part of the heel, and imprisoned by an anchor; in which condition of the limb, the body was thrown to the left. Jourdan reduced the dislocation easily, as in the preceding case. At the end of a month the cure was complete.

Dr. Edwin Canton<sup>3</sup> found in the dissecting-room of the Charing-Cross Hospital, what he regarded as a traumatic dislocation outwards upon the astragalus and inwards upon the cuboid. Malgaigne and Poinot have accepted Canton's view of the case, but Polaillon could interpret it only as a pathological displacement.

Hancock<sup>4</sup> describes a specimen taken from an old man who had received his injury two years before death, causing a dislocation outwards,

<sup>1</sup> Chelius, System of Surg., Amer. ed., vol. ii. p. 354.

<sup>2</sup> A. Dumas, Bull. Thérap., 1854, t. 46, p. 550.

<sup>3</sup> E. Canton, The Lancet, 1847, vol. i. p. 506.

<sup>4</sup> Hancock, Anat. and Surg. Human Foot, London, 1873, p. 216.

which had not been reduced. Dissection showed that the calcaneum was slightly separated from the cuboid, and more extensively from the astragalus, whose position in the articulation was completely changed. The astragalus, tibia, fibula, and calcaneum were ankylosed by bony callus.

#### § 4. Middle Tarsal Dislocations.

The scaphoid and cuboid bones may be dislocated from the astragalus and calcaneum, constituting what is termed, by Malgaigne, a "middle tarsal" dislocation. It is probable that, to some extent, the same thing has occurred in many of those cases which are reported as simple dislocations of the astragalus, or as dislocations at the astragalo-scaphoid articulation; but it occurs also occasionally in a degree so perfect and complete as to leave no doubt as to the true nature of the disjunction, and to entitle it to a separate consideration.

Mr. Liston mentions the case of a boy, *æt.* 14, who fell from a height of forty feet, striking, apparently, upon the extremity of the foot. The scaphoid and cuboid bones were found displaced upwards and forwards, so that the foot was shortened about half an inch, and had a clubbed appearance. No attempt was made to reduce the bones, and he left the hospital in three weeks, able to stand on the foot.<sup>1</sup>

Sir Astley Cooper has recorded in more detail a similar example. A man, working at the Southwark bridge, London, received upon the top of his foot a stone of great weight. He was immediately carried to Guy's Hospital, and his condition is described as follows: "The os calcis and the astragalus remained in their natural situations, but the forepart of the foot was turned inwards upon the bones. When examined by the students, the appearance was so precisely like that of a club-foot, that they could not at first believe but that it was a natural defect of that kind;" but, upon the assurance of the man that previous to the accident his foot was not distorted, extension was made, and the reduction was effected. He was discharged from the hospital in five weeks, having the complete use of his foot.<sup>2</sup>

E. Delorme<sup>3</sup> mentions two cases observed by Thomas and Anger, respectively.

In Thomas's case, the foot had been traversed by the wheel of a wagon. Reduction could not be effected, and the patient died. The autopsy disclosed a displacement upwards of the astragalus and calcaneum upon the second row of the tarsal bones. The scaphoid was broken, and one of its fragments protruded at the sole of the foot. The cuboid was only partially dislocated from the calcaneum.

In Anger's case, a man had fallen from a height, and the arch of the foot appeared a little flattened, but the displacement of the bones could not be made out. The patient having died of erysipelas, the autopsy revealed a complete dislocation of the astragalus and calcaneum forwards upon the second row of the tarsal bones. The tubercle at the anterior

<sup>1</sup> Practical Surgery; also London Lancet, vol. xxxvii. p. 183.

<sup>2</sup> Sir A. Cooper on Disloc., etc., London ed., 1823, p. 376.

<sup>3</sup> Delorme, Thomas, and Anger. Poincot, op. cit., p. 1210.

portion of the scaphoid was almost entirely torn away. Even after dissection it was found difficult to reduce the bones.

#### § 5. Dislocations of the Cuboid Bone.

According to Piédagnel, quoted by Chelius, the cuboid bone may be dislocated upwards, inwards, and downwards, but Malgaigne affirms that he has found no case recorded in which the dislocation has occurred alone, or unaccompanied with a dislocation of one or more of the other tarsal bones.

#### § 6. Dislocations of the Scaphoid Bone.

Burnett has seen a dislocation of the scaphoid bone in which its connections with the astragalus were undisturbed, while at the same time it was completely separated from the cuneiform bones. By strong pressure exercised during several minutes, the os scaphoides was made to fall into its place. The dislocation was compound, yet the wound healed rapidly, and in a short time the recovery was almost complete.<sup>1</sup>

Rizzoli<sup>2</sup> also reports an example of simultaneous dislocation of the astragalus and scaphoid in a direction "inwards, upwards, and forwards," the injury being caused by jumping from a carriage. Rizzoli succeeded in effecting reduction with the aid of three assistants, by making counter-extension from the knee, the leg being in a position of semiflexion, while direct pressure was made upon the projecting scaphoid; Rizzoli himself seized the toes and the heel with his two hands, and made traction, bringing at the same moment the foot upwards.

Garland,<sup>3</sup> of Liverpool, saw a child *æt.* 4, with a compound dislocation of the scaphoid forwards, caused by a direct blow upon the top of the foot. The scaphoid was completely separated from the cuneiform bones. The reduction was effected not without much difficulty. When the child left the hospital there still remained some deformity, the foot being a little turned outwards; and the arch of the tarsus being somewhat flattened.

Several examples are recorded of a true dislocation of the os scaphoides, in which the bone had abandoned both the astragalus on the one hand, and the cuneiform bones on the other.

Piédagnel mentions a case in which the scaphoid bone was broken longitudinally, and its internal fragment, constituting the largest portion, was displaced inwards through a tegumentary wound. He was unable to effect reduction, and was compelled to amputate the foot.<sup>4</sup>

Walker has reported an example of dislocation forwards, occasioned by jumping upon the ball of the foot. The bone formed a marked projection upon the top of the foot, and a corresponding depression existed below. An attempt was first made to accomplish the reduction by simple pressure with the thumbs; but this having failed, the surgeon bent the extremity of the foot forcibly downwards, and by continuing to press

<sup>1</sup> Burnett, Lond. Med. Gazette, 1837, vol. xix. p. 221.

<sup>2</sup> Rizzoli, Clin. Chir. trad. par Andreini, Paris, 1872, p. 146.

<sup>3</sup> Garland, Anat. and Surg. of Human Foot, London, 1873, p. 234.

<sup>4</sup> Piédagnel, Journ. Univ. et Heb., tom. ii. p. 208.

upon the scaphoid, it fell into its position easily and with a distinct click. In about three weeks the patient was able to walk with only a slight halt, and no deformity remained.<sup>1</sup>

Robert W. Smith<sup>2</sup> has also reported a case of ancient dislocation of the scaphoid upwards, in a man who several years before had fallen from a horse, the foot being caught in the stirrup under the animal. The bone projected in front of the head of the astragalus; the sole of the foot was very much flattened, but walking was not at all interfered with.

#### § 7. Dislocations of the Cuneiform Bones.

The cuneiform bones may be dislocated without having separated from each other, of which two or three examples are recorded; or, which is more common, the internal cuneiform may be dislocated alone. Says Sir Astley Cooper: "I have twice seen this bone dislocated; once in a gentleman who called upon me some weeks after the accident, and a second time in a case which occurred in Guy's Hospital very lately. In both instances the same appearances presented themselves. There was a great projection of the bone inwards, and some degree of elevation, from its being drawn up by the action of the tibialis anticus muscle; and it no longer remained in a direct line with the metatarsal bone of the great toe. In neither case was the bone reduced. The subject of the first of these accidents walked with but little halting, and I believe would in time recover the use of the foot, so as not to appear lame. The cause of the accident was a fall from a considerable height, by which the ligament was ruptured which connects this bone with the os cuneiforme, and with the os naviculare. The second case, which was in Guy's Hospital, my apprentice, Mr. Babington, informs me happened by the fall of a horse, and the foot was caught between the horse and the curbstone."<sup>3</sup>

Villars<sup>4</sup> met with an example of dislocation of the cuneiform internum upwards and inwards, which he reduced by extension, abduction, and pressure on the second day; at the end of two months the patient could walk easily.

In a case reported by Meynier<sup>5</sup> the dislocation of this bone was thought to be due to muscular contraction alone. The reduction was easily effected.

Fitz-Gibbon<sup>6</sup> reports a case of dislocation of the internal cuneiform downwards and inwards, from a direct blow. Reduction was easily accomplished by extension and direct pressure, and recovery took place without accident.

Lemoine<sup>7</sup> met with a similar case in which reduction attempted on the nineteenth day was found impossible. Four months after the accident the patient was able to walk, but not without fatigue.

In a case of compound dislocation seen by Mr. Key, reduction was

<sup>1</sup> Walker, *The Medical Examiner*, 1851, p. 203.

<sup>2</sup> R. W. Smith, *Dublin Hosp. Gaz.*, 1855, vol. ii. p. 76.

<sup>3</sup> Sir Astley Cooper, *op. cit.*, p. 383.

<sup>4</sup> Villars, *Poulet, Gaz. Méd. de Paris*, 1851, p. 757.

<sup>5</sup> Meynier, *Gaz. Méd. de Paris*, 1851, p. 520.

<sup>6</sup> Fitz-Gibbon, *Dublin Journ. Med. Sci.*, 1877, vol. lxiv. p. 271.

<sup>7</sup> Lemoine, *Rev. Mens. de Chir.*, 1883, No. 2, p. 121.

effected, and in two months the cure was so far completed that the patient walked with only a slight lameness.<sup>1</sup> Nélaton, in a similar case of compound dislocation, unable to reduce the bone, removed it completely, and the patient recovered.<sup>2</sup>

A dislocation of the second cuneiform has been observed by Wm. H. Folker<sup>3</sup> and by B. Anger.<sup>4</sup>

In Folker's case reduction was easily effected. In the case reported by Anger the dislocation was incomplete, not protruding more than one centimetre, but it could not be reduced.

Robert Smith has called attention to a species of dislocation of the internal cuneiform bone not before very accurately described; but of which he has presented two examples. It consists in simultaneous dislocation of the metatarsus and internal cuneiform; that is to say, the first metatarsal bone, together with the internal cuneiform, is dislocated upwards and backwards upon the tarsus, carrying with it also the four remaining metatarsal bones. In both of the examples seen and recorded by him the dislocations were ancient, and no account could be obtained of the precise manner in which the accidents had been produced. The feet were foreshortened to the extent of an inch or more in consequence of the overlapping of the bones, yet the heel in each case preserved its natural relations to the tibia, not being proportionately lengthened as is the case in dislocations of the tibia forwards. The plantar surface of the foot was turned inwards, and instead of being concave it was convex, both in its antero-posterior and transverse diameters. A transverse ridge on the top of the foot also indicated the line of the projecting bones. Both of these cases were verified by a careful dissection.<sup>5</sup>

Dupuytren has reported in his *Treatise on Injuries of the Bones*, a similar case, occurring in a woman, æt. 39, who was brought immediately to Hôtel Dieu. She stated that in descending from the bridge of St. Michael, with a burden of two hundred pounds, she fell in such a way that the whole weight of the body was received on the right foot, and that, at the moment she made an effort to check herself in falling, she experienced extremely severe pain in this part, and heard a very distinct snap; she was unable to raise herself from the ground. On the following morning Dupuytren reduced the bones with very little difficulty by extension, combined with pressure against the dislocated ends. The bones went into place with a loud snap, and in two or three months she left the hospital, with only a little lameness.<sup>6</sup>

Bryant has seen two cases of simultaneous displacement of the cuneiform internum and the corresponding metatarsal bone.

Mr. Smith, without intending to question the possibility of a simple dislocation of the metatarsal bones, of which, indeed, Malgaigne has collected a number of well-authenticated examples, is inclined to believe that, when a dislocation of the bones of the metatarsus is the consequence

<sup>1</sup> Key, *Guy's Hosp. Rep.*, 1836, vol. i. p. 544.

<sup>2</sup> Nélaton, *Malgaigne, op. cit.*, p. 1076.

<sup>3</sup> Folker, *The Lancet*, 1856, vol. ii. p. 283.

<sup>4</sup> A. Anger, *Traité, iconographique des Malad. Chir.*, Paris, 1865, p. 356.

<sup>5</sup> Robert Smith, *Treatise on Fractures, etc.*, Dublin ed., 1854, p. 224 et seq.

<sup>6</sup> Dupuytren, *op. cit.*, p. 326.

of a fall from a height, the individual alighting upon the anterior part of the foot, it is, in general, that variety which has now been described. And this aptness on the part of the cuneiform bone to maintain its connection with the first metatarsal bone, he would ascribe mainly to the fact that both the peroneus longus and tibialis anticus have attachments to each of the bones in question.

Dr. Bertherand, of Algiers,<sup>1</sup> in 1856 reported a case of simultaneous dislocation of all the cuneiform bones, without separation from the metatarsal bones, caused by a fall upon the sole of the foot. The dislocation was not reduced, and was only seen by Bertherand two years after the accident occurred. The foot was atrophied; the tarsal and metatarsal articulations were ankylosed, and he walked entirely on his heel.

## CHAPTER XXIV.

### DISLOCATIONS OF THE METATARSAL BONES.

DISLOCATIONS of one or more of the metatarsal bones, at the points of their articulations with the tarsus, have been known to occur in almost every direction. They may be occasioned by crushing accidents, or more often perhaps they have been caused by a fall backwards or forwards, when the anterior extremity of the foot was wedged under some solid body and immovably fixed. They may be produced, also, by alighting upon the ball of the foot when falling from a height. I have noticed, however, that Mr. Robert Smith inclines to the opinion that this will, in general, only produce the species of dislocation which he has particularly described, and to which reference has been made in the preceding chapter.

The symptoms which characterize the dislocation of the whole range of metatarsal bones upwards and backwards will, when the dislocation is complete, resemble very much those which belong to the dislocation described by Smith. The dorsum of the foot will be shortened antero-posteriorly, the two arches of the foot will be lost upon the plantar surface, or even actually reversed, a ridge will traverse the back of the foot and a corresponding depression will exist underneath.

In some cases, however, the dislocation is not complete, the articulations being only sprung, and then there can exist no foreshortening of the foot, and all the other signs will be less striking.

If only a single bone is dislocated, the diagnosis is generally very easily made out, unless, indeed, considerable swelling has already occurred.

Mr. South says that, in 1835, a case was admitted to St. Thomas's Hospital, under Mr. Green's care, of dislocation of the last two metatarsal bones, occasioned by the falling of a heavy chest upon the inside of the foot. "Upon the top of the foot was a large swelling before and below the outer ankle, and behind it a cavity in which two fingers

<sup>1</sup> Bertherand, Bull. Soc. de Chir. de Paris, 1856-57, t. 7, p. 361

could be easily buried, in consequence of the bases of the metatarsal bones having been thrown upwards and backwards upon the top of the cuboid." The reduction was accomplished with much difficulty by continued extension, and as the bones resumed their place a distinct crackling was heard.<sup>1</sup>

Liston reduced a dislocation upwards of the first metatarsal bone. Malgaigne mistook a dislocation of the fourth bone for a fracture, and did not attempt the reduction until the seventh day, when, after five successive trials, the head entered with a noise into its cavity. In a dislocation of the second, third, and fourth metatarsal bones, he also failed to detect the true nature of the accident until the tenth day, when he proceeded to attempt reduction, but failed. Inflammation, suppuration, and delirium followed, and the patient died on the forty-first day. Tufnell failed in a similar case, although his patient finally recovered with a not very useful limb. Malgaigne failed to reduce the bones also in a recent case of dislocation of the first four bones, although he used chloroform and diligently tried various means. The same writer has seen one example of ancient dislocation, which was not recognized by the surgeon by whom the patient was first seen. Monteggia reports a case of dislocation of the last two metatarsal bones, which was not at the time recognized. On the tenth day swelling commenced, and soon after the patient died in convulsions.<sup>2</sup>

Dr. W. C. Shaw, of Pittsburg, reports the case of a man 35 years old, who, falling from a height, "struck with all his weight upon a sharp edge of stone, striking upon the inner and under surface of the right metatarsal bones, dislocating the proximal end of the first metatarsal bone upwards, and apparently carrying the second with it." After several ineffectual attempts at reduction made by himself and others, in which extension and direct pressure were employed, he succeeded finally by "bending the foot to an acute angle on the inner surface, approximating the articulating surfaces of the dislocated bones, and quickly extending the foot."<sup>3</sup>

These references sufficiently illustrate the difficulty which surgeons have experienced in the reduction of these bones, when a portion only is displaced: a difficulty which is probably due to the fact that it is almost impossible to make extension upon a single metatarsal bone. We might expect more from forced dorsal flexion, as advised in the case of the phalanges, and which was successfully practised by Shaw. Direct pressure upon the displaced head cannot be expected to accomplish much in these accidents, owing to the small amount of surface presented against which the force can be properly applied.

If, on the other hand, all the bones are dislocated at once, the reduction is generally accomplished with ease by simple extension, combined with properly directed pressure. Bouchard and Meynier succeeded without difficulty in two cases of backward dislocation; Smyley was equally successful on the sixth day, in a case of dislocation downwards. Laugier reduced an outward dislocation of all the bones by pressure and extension

<sup>1</sup> South, Note to Chelius's Surg., vol. ii. p. 256.

<sup>2</sup> Malgaigne, op. cit., p. 1077 et seq.

<sup>3</sup> Shaw, Pittsburg Med. Journ., 1882, p. 301.