AN ACCOUNT OF AN INSTANCE
OF
REMARKABLE
DEFORMITY OF THE LOWER LIMBS.

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As the opportunities of examining malformations of the human body so as to make known the anatomical condition of the parts must necessarily be few, I am induced to consider the account of a single and rare instance of monstrosity worthy of presentation to this Society. In this case, whose peculiarities I will notice presently in detail, the deformity affected the lower limbs, but chiefly the thighs, and it involved the bones, the muscles, the joints, and the blood-vessels. Thus the thigh-bone was absent, except a rudiment of the lower end on the left side, and its corresponding joints were likewise wanting; the muscles were altered in various respects; the large femoral artery was transferred from the front to the back of the limb; and not the least interesting particulars in the history are the advanced age (55 years), and the extraordinary strength and activity of the person.

These peculiarities existed in a man named Harvey Leitch, or Leach; and our knowledge of them is due to the unusual circumstance of his body being given by himself to

the late Mr. Liston for examination.¹ He was well known on the stage in his day, and appeared in the guise of imps and monkeys. It may be within the recollection of some of the Fellows of this Society, that he was an object of interest and curiosity in this metropolis a few years before his death in 1847, when he feigned to be a newly-discovered animal, and invited inquiry into his nature by the question, "What is it?" in public hand-bills.

In the outward shape the body was natural in the upper, but deformed in the lower part. Thus the upper half, including the trunk, was well fashioned, and corresponded to the like part of an athletic man of five feet seven or eight inches, with rather long arms, for the measurement across the chest to the tips of the fingers gave five feet eleven inches. But the lower members were withered, though in an unequal degree, and the right was shorter and much more malformed than the left one. The disproportion between the upper and the lower halves of the man, and the aptitude of the bodily form for the creeping or climbing movements, will be apparent on reference to fig. 1, which has been most obligingly drawn by Mr. Ford from a cast in the Museum of University College. The following were the measurements of the body:—On the side of the longest limb (the left), the length was four feet, but of this the trunk forms the greatest part; for, from the top of the head to the front of the pubes, the measurement was two feet nine inches; whilst the right limb was about a foot, and the left was longer by only three or four inches, when it was in a half-flexed position. In consequence of the great difference in length between the upper and lower members, the hands could be brought to the ground almost during the

¹ At the time of the examination, notes of the anatomical condition were taken by myself, and some sketches of the parts were made by my late valued friend and colleague, John Phillips Potter, with the view to publication. And through the kindness of his father, the Rev. J. P. Potter, to whom I take this opportunity of expressing my obligations, I have since been furnished with those drawings, but their incompleteness has interfered with their use in illustrating this paper.

erect attitude, so as to assist in progression, and the body could be easily converted, by means of a suitable covering, into a form resembling that of a baboon. In spite of the imperfect state of the lower limbs, there was great personal activity; and as the body was supported almost altogether on the left limb, the right foot touching the ground only with the toes, most of the movement must have been derived from it and the arms.

Bones.—The deficiency in the bony framework is confined to the lower part of the body, and is greater on the right than the left side, in correspondence with the greater alteration in the external form.

The *pelvis* is rather below the average, both in size and strength. In each *os innominatum* the acetabulum is wanting, and the place of that articular cavity is occupied by a small hole or depression, rather less than half an inch in diameter. In each bone, also, the lower and anterior spine of the ilium is widened, and is covered by a smooth surface for articulation with one or two small irregular pieces of bone, *a* (rudiments of the trochanters), to which the flexor muscles were attached. These facts and others respecting the form and connections of the bones are well illustrated in the drawings (Plate II) by Mr. Ford, from the skeleton.

No *femur* exists in the right limb; and only a fragment of the lower end of that bone, measuring two inches in depth and three in width, is present in the left. The patella was not found on either side.

Tibia and fibula.—In the second segment of the limbs both the bones are developed, but they are more malformed on the right than the left side. The right tibia is widely forked above (Plate II, fig. 2), and each point is attached by muscle and ligament to the pelvis, but without any articulation or even contact; the outer point, which is the continuation of the shaft of the bone, is ankylosed with the head of the fibula.¹ The corresponding bones of the left leg are nearly

¹ A somewhat similarly-shaped femur is in the museum of University

of the usual size, but they are slightly deformed above, and are rather bent in their shafts.

In the right *foot* the natural arch is much increased, and the phalanges can be placed at right angles to the metatarsal bones, as they are represented in Plate II. In the left foot the articulation between the astragalus and the os calcis is surrounded by osteophytic growths, as if to give increased security to the joint.

Articulations.—In consequence of the absence of the cavity of the acetabulum and of the part of the femur that naturally fits into it, there was not any hip-joint on either side, so that the connection between the bones of the limbs and the pelvic arch was effected by muscle and ligament, but without contact.

In the right limb the two branches of the tibia were directed upwards towards the pelvis, one point being near the front of the pubes, the other behind the front of the innominate bone, and were fixed in those positions by fibrous bands and muscles, whilst at the midpoint of the fork the bone was further united to the pelvis by other ligamentous bands. In the left limb the remnant of the femur projected upwards amongst the muscles, and was connected by ligamentous structures to the front of the innominate bone: on this left side the knee-joint was nearly complete, only the patella being absent.

At the front of the os innominatum, between the smooth surface over the lower spine and the loose portions of bone before referred to (Plate II), was a large, loose, multilocular sac or articulation, over which the flexors and extensors of the limb were spread.

Muscles.—Alterations in the muscular system were proportioned to the malformation in the bones, and some muscles were so transformed or joined with others, that the task of distinguishing them was not always easy.

The flexors of the thigh had the usual arrangement at their origin, and were attached below on both sides, in College, London, No. 2990; it was obtained from a deformed limb in the dissecting room.

the absence of the femur, to the loose piece of bone (analogue of the trochanter) that articulates with the front of the os innominatum. The direct extensor (*gluteus maximus*) takes its ordinary origin, but varies in its insertion on the two sides; for, on the right, where the thigh bone is altogether wanting, it is fixed into the upper and outer point of the tibia; and, on the left, into the fragmentary lower end of the femur.

The abductors and rotators of the thigh were inserted on both sides, into the loose piece of bone before mentioned. The adductors in the right limb, only two inches in length, were attached to the inner point of the tibia; whilst in the left, where they were rather longer, they were connected with the remnant of the femur.

The extensors of the knee-joint disappeared on the right side with the absence of the articulation and the femur, but were present on the left, though they were united to the end of the femur above the joint, and may thus give an explanation of the disappearance of the patella. The flexors of the same articulation were in usual force in the left, or more complete limb, but my notes do not state the condition in the right one.

Between the osseous and the muscular systems a mutual dependence is thus observable. For where the femur is absent, as on the one side, the muscles that are usually attached to it are either wanting, or, if present in a rudimentary condition, they are inserted into the contiguous bones. And where a fragment of the thigh-bone remains, as in the left limb, its muscles are developed in a corresponding degree.

Blood-vessels.—A great departure from the usual arrangement was found in the distribution of the blood-vessels; inasmuch as the leading anterior femoral vessel was absent from the usual place, and in its stead a large artery was developed at the back of the thigh with the sciatic nerve. Further, the known proportion between the internal and external iliac arteries was reversed, and the former became, contrary to the rule, the channel through which the blood was supplied to the greater part of the lower limb. The following was the disposition of the vessels:

The external iliac artery measured only one quarter of an inch in diameter, and furnishing, as is its wont, the epigastric and circumflex iliac offsets, left the abdomen beneath Poupart's ligament. In the thigh the vessel passed deeply amongst the adductor muscles, like the profunda artery, and distributed the circumflex and the other branches belonging commonly to the profunda; this unusual artery represented in part the femoral, by its continuity with the external iliac trunk, and, in part, the deep muscular artery of the thigh, by its position, and the manner of its branching.

The internal iliac artery was half an inch in diameter, and, after passing through the pelvis, where it supplied the usual visceral and parietal branches to that cavity, it issued below the pyriformis muscle with the great sciatic nerve. At the back of the thigh it accompanied that large nerve, and bifurcated below the knee-joint into the anterior and posterior tibial trunks. In the left, or more perfect limb, the muscular connections of the artery were like those of the companion nerve. This large posterior femoral vessel, by which the blood was conveyed through the first segment of the limb to the other segments, occupies for a given extent the position of the sciatic artery; but beyond the region of the buttock it has no analogy to any known vessel, for an artery distinct from the nerve is not recognised in the present state of our knowledge.

A very large internal saphenous vein was present, and this opened into a deeper trunk, lying by the side of the anterior artery of the thigh. My notes do not refer to the farther condition of the veins; but in a case which has been reported by M. Caillard,¹ the large venous trunk of the limb ascended from the popliteal vein, along the back of the limb with the unusual artery as far as the small trochanter: at this level it was directed forwards through the adductor muscle to the usual position of the femoral vein at the top of the thigh.²

The above-mentioned arrangement of the arteries of the

¹ A reference to this will be found farther on at p. 446.

² It is a question, whether this is the common arrangement of the

thigh, viz., the presence of two trunks—a small anterior and a large posterior—corresponds to that of the arteries of the lower limb of the bird, and presents us with a good illustration of the resemblance that the so-called varieties in man may bear to the condition of the parts in beings lower in the scale of the vertebrated class of animals. And as such deviations from the archetype do not occur without suggesting to us some hypothesis as to their mode of production, I am inclined to suppose that the present remarkable arterial arrangement may be due to the existence, in all cases, at an early period in the formation of the foetus, of a temporary condition of the vessels resembling the permanent state in birds. Our facts seem to point to the probable development of a vessel at the back of the thigh, with the sciatic nerve, at some stage of foetal life: for such a posterior vessel is constant in birds; it occurs also, rarely however, in man; and in the adult human body an artery always accompanies the nerve for a given distance. With the existence of the supposed vessel, for a certain period in the growth of the embryo, the observed peculiarities might be explained; since if there is the common distribution of the arteries of the limb, it may be supposed that the elongation of the posterior vessel is arrested, only the upper third remaining small and pervious, as the sciatic artery of the adult, whilst the femoral artery becomes of large size. But, if the unusual distribution is present, the reverse of this is the result, as in Harvey Leitch; for then it may be supposed that the posterior vessel (that with the nerve), is prolonged into the limb, and is increased in size, by its taking on the office of supplying blood to the leg and foot, in consequence of the anterior or femoral artery being interrupted in its growth by some disturbing influence.

Only three cases of a like departure from the typical form vein with this unusual state of the artery. For the vein may have a like disposition without any peculiarity of the artery. (See Quain's 'Anatomy of the Arteries,' pl. viii, fig. 3.) In the Museum of the Royal College of Surgeons, Edinburgh, in the Barclay Collection, is also a preparation, No. 779, illustrating this exceptional distribution of the veins.

of the blood-vessels have I been able to find recorded. One is described by Dr. P. H. Green,¹ of which the preparation is said to be in the museum of La Pitié, Paris. Another has been observed by M. Caillard,² and has been published in his graduation thesis. And the third was noticed by M. Dubrueil,³ Professor of Anatomy in Montpellier. In all three examples the peculiarity of the vessels existed only on one side of the body, two being on the right and one on the left; and it was present in well-formed bodies: in my case, on the contrary, the peculiarity was the same in both lower limbs, and occurred with deformity of the members. It appears, too, in accordance with the conclusions arrived at by Professor Quain,⁴ that a similar deviation from the standard condition of the vessels is found much more commonly on one than on both sides of the body.

The surgical interest of this rare peculiarity of the blood-vessels has not been overlooked by those who have had the opportunity of observing it; but as the subject is not noticed in our anatomical and surgical works, I may perhaps be allowed to refer to the point, with the hope that my remarks may be the means of making it known to others. That such a state of the vessels might be a cause of much embarrassment to a surgeon in an amputation of the thigh, can be readily imagined; and that much blood might be lost, under some circumstances, before even the source of the hæmorrhage would be suspected by him who was unacquainted with this occasional peculiarity, is very probable. And in the case of an attempt to tie the femoral artery in the upper part of the thigh for an aneurism, or a wound lower in the limb, the operator might be much perplexed at not finding the large femoral artery, but only an inconsiderable artery after much

¹ In the *Lancet* of Feb. 18, 1832.

² *Propositions de Médecine et de Chirurgie*. Thèse, No. 307, p. 18; Paris, 1833.

³ *Des Anomalies Arterielles*, with an Atlas of Plates, in 4to; Paris, 1847. See p. 36, and plates 11 and 12.

⁴ *The Anatomy of the Arteries, &c.*, with an Atlas of Plates, in folio; London, 1840-44.

search, the ligature of which would arrest neither the pulsation in the aneurism nor the bleeding from the wound.

Nerves.—The nerves of the limbs were regular in their number and position, and each of the three principal nerves (sciatic, anterior crural, and obturator,) was accompanied by an artery. My notes refer to the decrease in size of the obturator and the anterior crural.

My notice of this *monstrum informe* would be scarcely complete without a short reference to the place that it would occupy in a classification of so-called monsters. As the departure from the man-like form is limited to absence of parts of the lower members, this curious case would be included amongst those forms distinguished by deficiency of the limbs. Professor W. Vrolik has illustrated this kind of malformation in plates 76 and 77, of his work on *Monstrosities*.¹ In order to diminish the length of my paper in this particular, I may refer to the work above mentioned.

In conclusion I may remark, without entering into the consideration of the cause of the malformation, that the influence originating the unnatural state of the body in Harvey Leitch was confined almost altogether to the upper segment of the lower limbs, and was limited to the fore and central parts of that segment; for the posterior muscles of the thigh were less altered than the anterior, whilst a large vascular trunk was constructed at its back part as a substitute for an anterior, interrupted, and diminished vessel. The bodily imperfections seem, then, to be owing to a disturbance of the formative process during the sprouting of a certain part of each lower limb.

¹ Tabulæ ad illustrandam Embryogenesisin Hominis et Mammalium.

EXPLANATION OF THE PLATES.

PLATE I.

This drawing represents the outward shape of the man : it has been copied from a cast taken after death, but the artist has very skilfully raised the drooping head, and animated the face. During the taking of the cast, the right arm was supported by a string in its present position.

PLATE II, FIG. 1.

In this sketch the lower deformed half of the skeleton, from the last dorsal vertebra downwards, is very well portrayed. The left limb has been drawn in an extended and straight position, instead of a bent and sloped one, as in the cast, so that it appears much longer in comparison with the other leg, than in fig. 1. The spine has been bent to the left side by the action of the muscles.

- a.* Separate pieces of bone, that articulate with a smooth surface on the lower and anterior spine of the os innominatum : two are on the left side, but only one on the right.
- b.* A small pit in the situation of the acetabulum, which was rather more than a quarter of an inch in diameter.
- c.* The remnant of the femur on the left side.
- d.* The left tibia ; *d'*, the right one much altered.

FIG. 2.

A drawing of only the tibia and fibula of the right limb : the two are anchylosed at the upper articulation.

- a.* The fibula : it is separate from the other bone below, and enters largely into the ankle-joint.
- b.* The tibia, which is branched above into two points : by means of these points it was attached chiefly to the pelvis, but ligament was also inserted into the roughness at the centre of the fork.