

14. DESCRIPTION of some IGUANODON-REMAINS indicating a new Species,
I. SEELY. BY J. W. HULKE, Esq., F.R.S., Pres. G.S. (Read
February 8, 1882.)

[PLATE IV.]

ALTHOUGH a very large number of *Iguanodon*-remains are now to be found in the public and private collections in this country, they consist, for the most part, of dissociated bones. Discoveries of several bones of this Dinosaur under such circumstances as warrant the belief that they formed part of one skeleton have been extremely rare, on which account our knowledge of the proportions of the several parts of the skeleton has remained very incomplete.

The announcement of the discovery of a very large series of *Iguanodon* fossils at Bernissart in 1878 raised the expectation that before long a complete osteology of *Iguanodon* would issue under the auspices of the Belgian government. An examination of some of these remarkable fossils, which the obliging director of the Musée d'Histoire Naturelle at Brussels allowed me to make in Aug. 1879, showed me that their importance had not been exaggerated, and it led me to defer the completion of this communication, which I had begun some time before. Having, however, recently been told by M. Boulenger, to whom their description is intrusted, that no exhaustive memoir on them is to be expected for several years, I no longer hesitate to present to the Society an account of some fossils obtained by myself in the Isle of Wight in 1870, which afford, in particular, very considerable information respecting the form and proportions of the several members of the hind limb.

These remains comprise the nearly complete right hind limb and the right humerus, the left haunch-bone, and the left foot, three caudal vertebræ, and several chevrons.

All these fossils, with the exception of the humerus and vertebræ (which occurred at the distance of a few feet east of the others in the same bed), were lying in a small area of a few square yards, in a bed of hard nodules intercalated between the red and purple clays below and the iron-stained flint-gravel which caps the cliff west of Brook Chine. This nodule-bed has an apparent westerly dip; it soon crosses the shore, where it is usually hidden by sand and seaweed; and it then passes out seawards under the well known Pine Raft. A few yards east of where this nodule-bed touches the cliff-foot, the cliff is cut through by a small gully worn by a little rill. In the east bank of this gully were the fossils.

The coxswain of the lifeboat told me that, about ten years before, he saw a gentleman take out of the same spot nearly a cart-load of bones. I have not been able to ascertain the name of this fortunate discoverer, or the present locality of these fossils.

Ilium (Pl. IV. fig. 1).—The present length of this large and massive bone is 118 centim. (47 in.)*; but as a small piece is broken off at each end, its length when perfect was probably not less than 124

* The reduction to English measure throughout is only approximate.

Fig. 1.—*Restoration of the Left Hind Limb of Iguanodon Seelyi.*
(About $\frac{1}{20}$ nat. size.)



centim. (about 4 feet). Its greatest depth, from the dorsal to the ventral border behind the acetabulum through the ischial process, is 33 centim (13 in.). The dorsal border viewed from above is sinuous; it bends outwards above the ischial process, and again in the preacetabular process. In a side view it is seen to rise slightly from the last-named process to above the ischial process, its highest point, whence it slopes uniformly downwards to the posterior end of the bone. The ventral border behind the acetabulum is straight; it is longitudinally grooved. The preacetabular process (*pa*) is relatively short, its length being less than that of the postacetabular part of the bone; it contracts rapidly from its stout base, and for more than half its length it is much flattened. Its cross-section at 10 centim. (4 in.) from its free end is an oval figure the diameters of which are 3 $\frac{2}{5}$ centim. (1 $\frac{1}{5}$ in.) and 11 centim. (4 $\frac{1}{5}$ in.). The chord of the acetabular arc is 23 centim. (9 in.). The pubic process (*p*) is angular; it juts downwards and forwards. The ischial process (*i*) is a stout low swelling. The outer surface of the ilium is

relatively even. The inner surface is stamped with a chain of impressions overhung by a projecting ledge, marking the attachment of the sacrum.

The elongated figure of the ilium places the animal represented by it beyond doubt in the family Iguanodontidæ. In the comparative shortness and stoutness of the preacetabular process and the more tapering form of the postacetabular front of the bone, this ilium certainly differs from that of *I. Mantelli*, regarding as the type of this latter the ilia preserved in the large slab from Bensted quarry in the British Museum, which originally formed part of the collection of the late Dr. G. A. Mantell.

Femur (Pl. IV. fig. 2).—The proximal end of this gigantic bone is crushed; but the distal end is fairly preserved. The present length of the femur is 92 centim. (3 feet); when entire the length was probably not less than 108 centim. ($42\frac{1}{2}$ in.). The distal end has the usual condylar division; the condyles project strongly backwards. The anterior intercondylar groove (*ic*) is characteristically deep and narrow. The shaft has an apparent twist, owing to a change in the direction of its surface; that which at the proximal end is external becomes towards the distal end anterior or dorsal. The inner trochanter (*it*) is strongly marked. The girth of the femur at the distal condylar end is 82 centim. ($32\frac{1}{4}$ in.), and the breadth across the condyles is 32 centim. ($12\frac{3}{5}$ in.). The girth of the shaft just above the condyles is 69 centim. (27 in.), and that immediately above the inner trochanter is 64 centim. ($25\frac{1}{5}$ in.). Towards the proximal end the girth again increases. These measurements will furnish an idea of the size and proportions of this thigh-bone, which is one of the very largest I have yet seen.

Tibia (Pl. IV. fig. 3).—I found this lying athwart the thigh-bone. Both its ends are much crushed and mutilated. The precnemial crest was very large; it was so shattered that in spite of great care it fell to pieces as we lifted the bone out of the cliff, and it could not be restored. The shaft has the usual subprismatic figure in its central part, and it expands towards its articular extremities. The breadth of the lower end, approximately inferred from that of the composite articular surface formed by the proximal end of the metatarsal bones, will not have been less than 35 centim. (nearly 14 in.); the proximal end still shows, obscurely, a subdivision into two parts corresponding to the femoral condyles. The length of the tibia in the present mutilated state is 92 centim. (36 in.); 102 centim. (40 in.), somewhat less than that of the femur, will not, I think, be an unfair estimate of its length when perfect. The girth at the middle of the shaft is 45 centim. ($17\frac{1}{10}$ in.).

Fibula (Pl. IV. fig. 4).—This bone, nearly as long as the tibia when perfect, has been shortened to 85 centim. ($32\frac{1}{2}$ in.) by mutilation of its distal end. The proximal end is broad and flattened; the tibial aspect is slightly hollowed. The shaft is relatively slender; its figure is subprismatic. (The *os calcis* and *astragalus* were not recovered.)

Foot (Pl. IV. fig. 5).—The bones of the left metatarsus, cemented together by rock, preserve their natural relations but slightly disor-

dered. Those of the right metatarsus had fallen apart, but were lying by one another. Both metatarsi demonstrate conclusively that the hind foot in *Iguanodon* has three, and only three, functional toes, the number actually present in the hind foot of an immature *Iguanodon* in Mr. S. H. Beckles's collection, several years since described and figured by Prof. Owen, in his 'Fossil Reptilia of the Wealden Formations.'

Of the three metatarsals the inner is shortest, being 26 centim. ($10\frac{1}{4}$ in.) long. Its proximal end is much extended in the dorso-plantar direction, this diameter measuring 21.3 centim. ($8\frac{3}{8}$ in.), whilst the transverse or horizontal diameter is but 10.2 centim. (4 in.). The distal end, condylarly divided, is asymmetrical, the outer condyle being narrower and slightly deeper than the inner, than which it also diverges more from the axis of the bone. The intercondylar groove scarcely rises above the middle of the articular surface. The inner surface of the metatarsal (that which looks towards the middle metatarsal bone) is flattened; and its junction with the dorsal or upper surface in the distal half of the bone projects in the form of a thin overhanging lip, by which it may be distinguished from the outer metatarsal. This process is not peculiar to *Iguanodon*; for it is distinctly represented in a metatarsal of *Poikilopleuron Bucklandi*, figured by E. Deslongchamps, père, also in Prof. Cope's figures of a metatarsal of *Hadrosaurus Foulkii*, and it is present in the innermost metatarsal of *Hypsilophodon Fovii*.

The middle metatarsal bone is 35.5 centim. (14 in.) long. The shape and proportions of its proximal end, now distorted, do not appear to have differed much from those of the inner metatarsal. The dorsal border of this end is produced upwards in the form of a lip adapted to the pulley-groove of the conjoined astragalo-calcaneum. The distal condyles are nearly symmetrical. The intercondylar groove rises higher than in the other metatarsals. The breadth across the condyles is 14 centim. ($5\frac{1}{2}$ in.); that of the middle of the shaft is 10.5 centim. ($4\frac{1}{8}$ in.), the vertical diameter at this part being 6.4 centim. ($2\frac{1}{2}$ in.).

The outer metatarsal is 29 centim. ($11\frac{3}{8}$ in.) long; its length is therefore intermediate between those of the other two metatarsals. The proximal end is concave vertically and slightly so horizontally, its figure being the counterpart of the corresponding articular surface of the calcaneum. The distal condyles are asymmetrical; the outer, that furthest from the middle line of the foot, is narrower, deeper, and more divergent from the axis of the bone than is the inner condyle. The breadth across the condyles is 12.6 centim. (5 in.); and that of the proximal end is 15 centim. ($5\frac{7}{8}$ in.).

It has been already stated that neither of these metatarsi lends any support to the idea that the hind foot in *Iguanodon* had more than three functional toes. A fragment cemented by rock to the basal end of the inner metatarsal in the left metatarsus perhaps represents the rudiment of a fourth metatarsal preserved in Mr. Beckles's fossil, to which reference was lately made. The alternative of its being a piece of a chevron is suggested by the agglutination of two chevrons to the plantar surface of the metatarsus.

Phalanges.—With the exception of one proximal phalanx referable

to the right foot, which was found lying apart from the others, all the phalanges were found in three groups, each representing a toe of the left foot. Reconstructed on the type of the hind foot in *Hypsilophodon Fovii*, the outer toe has five, the middle four, and the inner toe three phalanges, the number assigned by Prof. Owen to these toes in his restoration of Mr. Beckles's specimen; these toes are therefore homologous with the three outer functional toes in *Hypsilophodon*, and with the 2nd, 3rd, and 4th toes of extant lizards.

Taking, for convenience of description, the toes in order from the inner to the outer side of the foot, the proximal phalanx of the inner toe is stout, and nearly as long as the corresponding phalanx of the middle toe, than which, however, it is more slender and constricted at the middle. The proximal end, now nearly flat, was doubtless, in the fresh state, adapted by a cartilaginous lip for the reception of the metatarsal condyles. The contour of this end is rudely trigonal, the apex directed outwards, the base towards the middle toe. The distal end of this as of all the other phalanges is condylarly divided. On the outer border of the phalanx, nearer to the proximal than to the distal end, is a swelling suggestive of the attachment of a strong tendon. The length of this phalanx between its extreme points is 15 centim. ($5\frac{9}{10}$ in.); the girth of the proximal end is 38 centim. (15 in.), that of the distal end 36 centim. ($14\frac{1}{5}$ in.), and that of the middle of the phalanx is 37 centim. ($14\frac{1}{2}$ in.). The horizontal diameter of the proximal end is 12·6 centim. (5 in.), and the vertical diameter 10·8 centim. ($4\frac{1}{4}$ in.). The breadth across the condyles is 11·5 centim. ($4\frac{1}{2}$ in.). The second phalanx of this toe, measured along its dorsal surface, is 6 centim. ($2\frac{1}{5}$ in.) long, less than half the length of the first phalanx; this surface is produced backwards in the form of a lip adapted to the intercondylar groove of the distal end of the first phalanx. The outline of the proximal end is triangular; the articular surface is concave in the vertical direction, and sinuous in the horizontal. The distal end is pulley-shaped; its articular surface is prolonged backwards along the plantar aspect of the bone, so as nearly to meet the proximal articular surface. The horizontal diameter of this phalanx is 9·5 centim. ($3\frac{3}{4}$ in.), and the vertical diameter 7·2 centim. ($2\frac{4}{5}$ in.). The third or ungual phalanx is only inferior in size to that of the middle toe. It is broad, blunt, and curved slightly downwards—a form adapted to grubbing. Its extreme length is 17 centim. ($6\frac{7}{10}$ in.). At about 4 centim. ($1\frac{3}{5}$ in.) from the proximal end its lateral borders project in a lip-like form, within which is a conspicuous submarginal nail-groove. The dorsal surface of the phalanx is convex longitudinally and transversely; the plantar surface is concave longitudinally, and slightly convex transversely. The vertical and horizontal diameters of the proximal end are each 7 centim. ($2\frac{3}{4}$ in.). The transverse, horizontal diameter at the base of the nail-groove is 10·1 centim. (4 in.), from which part the breadth contracts to 6·3 centim. ($2\frac{1}{2}$ in.) at the distance of 2 centim. ($\frac{4}{5}$ in.) from the distal end.

The middle, or second toe, had four phalanges, of which the second or antepenultimate was unfortunately not recovered. Unrecognized at the moment by the labourers who worked under my guidance, it was

probably thrown down the cliff with the rubbish; and later, when missed, it could not be found. The proximal phalanx is remarkably stout. Its extreme length is 13 centim. ($5\frac{1}{10}$ in.). The horizontal diameter of its proximal end is 14.1 centim. ($5\frac{5}{8}$ in.), and the vertical diameter 10.1 centim. (4 in.). The breadth across the condyles is 12.6 centim. (5 in.), and the vertical diameter at the intercondylar groove 7.5 centim. (3 in.). The vertical diameter at the middle of the phalanx is 7.3 centim. ($2\frac{9}{16}$ in.), the horizontal diameter 10.5 centim. ($4\frac{1}{8}$ in.). From these dimensions it will be seen that the figure of this phalanx is short, stout, somewhat flattened, and slightly contracted at the middle. The third phalanx is very short, only 4.2 centim. ($1\frac{3}{8}$ in.) long, measured along the upper surface. Its shape is rudely triangular. The vertical diameter of the proximal articular surface is 8.3 centim. ($3\frac{1}{4}$ in.), the horizontal 12.3 centim. ($4\frac{4}{5}$ in.). This surface is concave vertically and sinuous transversely. The dorsal surface in this as in all the other short phalanges is prolonged backwards in a lip-like form, adapted to the pulley-like articular surface of the phalanx behind it; and the distal articular surface, which has the form of a wide shallow pulley, is, as in the other short phalanges, prolonged on the plantar aspect nearly to the proximal surface of the bone. The terminal or ungual phalanx of this toe may be distinguished from that of the other toes by its symmetry. Its extreme length is 17.6 centim. ($6\frac{9}{10}$ in.). The horizontal diameter of the proximal end is 9 centim. ($3\frac{5}{8}$ in.), and the vertical diameter about 7 centim. ($2\frac{3}{4}$ in.). The articular surface is sinuous horizontally and concave vertically. The transverse or horizontal diameter at the base of the nail-groove is 11.2 centim. ($4\frac{2}{5}$ in.), and at the distance of 2 centim. ($\frac{3}{4}$ in.) from its distal end 6 centim. ($2\frac{1}{4}$ in.).

The third or outer toe has five phalanges. The proximal of these resembles that of the middle toe more than that of the outer toe; but it is shorter and, relatively to its length, it is stouter than the former. The horizontal diameter of its proximal end is 12.2 centim. ($4\frac{4}{5}$ in.), the vertical is 10 centim. ($3\frac{9}{10}$ in.). The same diameters of the distal end are 10.2 centim. ($4\frac{1}{5}$ in.), and 7.6 centim. (3 in.). The breadth of this phalanx at its middle is 8.6 centim. ($3\frac{3}{5}$ in.). The lateral mesial surface is flattened. The three succeeding phalanges resemble one another so closely as not to require separate descriptions. They resemble those phalanges which in the other toes are intermediate between the proximal and the ungual, and differ from these chiefly in their proportions, as may be seen by the following measurements:—

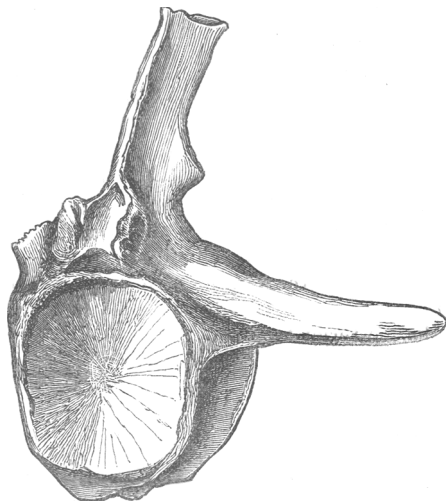
	2nd phal. centim.	3rd phal. centim.	4th. phal. centim.
Length along dorsal surface	4 ($1\frac{3}{5}$ in.)	3.5 ($1\frac{1}{2}$ in.)	2.3 ($\frac{9}{10}$ in.)
Horizontal transverse diameter	9.7 ($3\frac{4}{5}$ in.)	9.3 ($3\frac{3}{5}$ in.)	8.4 ($3\frac{1}{3}$ in.)
Vertical transverse diameter	8.4 ($3\frac{1}{3}$ in.)	6.1 ($2\frac{2}{5}$ in.)	6.2 ($2\frac{1}{2}$ in.)

All the three phalanges are therefore very short relatively to their horizontal diameter or breadth. In all, the dorsal surface sends

backwards a lip adapted to the intercondylar groove of the phalanx next behind; and the under surface is reduced to a minimum by the plantar prolongation backwards of the distal articular surface. The ungual phalanx of this toe is smaller than that of the other toes. Its figure is less symmetrical than that of the middle toe. An outward inclination serves to distinguish it from the claw-bone of the inner toe, than which it is also less blunt. Its present length is 14 centim. ($5\frac{1}{2}$ in.); but when perfect it was probably not less than 15.5 centim. (6 in.) long. The vertical diameter of its proximal end is 6.1 centim. ($2\frac{3}{8}$ in.), and the horizontal diameter 5.7 centim. ($2\frac{1}{4}$ in.). The breadth of the phalanx at the base of the claw-groove is 8.3 centim. ($3\frac{1}{4}$ in.), and at 2 centim. ($\frac{3}{4}$ in.) from the distal end it is 4.2 centim. ($1\frac{2}{3}$ in.).

Vertebræ (fig. 2).—The three caudal vertebræ were found cemented together by rock, which has preserved their natural sequence. A slight lateral dislocation has permitted me to lay bare their articular surfaces. The centra are short; measured along the neural surface their length is only 11.4 centim., 11 centim., and 10.6 centim. ($4\frac{1}{2}$, $4\frac{1}{3}$, and $4\frac{1}{6}$ in.). The vertical dimension, or height, measured from the neural surface to the under surface between the chevron-facets, is 18.6 centim., 18.4 centim., and 17 centim. ($7\frac{1}{4}$, $7\frac{1}{3}$, and $7\frac{1}{10}$ in.). The horizontal diameter below the root of the transverse process is 13.2 centim., 13.4 centim., and 12.3 centim. ($5\frac{1}{5}$, $5\frac{1}{4}$, and $4\frac{4}{5}$ in.).

Fig. 2.—*Oblique anterior View of an early Caudal Vertebra of Iguanodon Seelyi.* (About $\frac{1}{4}$ nat. size.)



A gentle expansion of the centrum towards its articular ends imparts to the lateral surfaces a slight concavity in the antero-posterior direction. These surfaces are nearly plane in the vertical direction; and below they converge slightly. The under surface is much reduced by the encroachment of the chevron-facets, of which the posterior is much the larger. The great size of these facets diminishes the lateral surfaces in the lower third of their extent;

and it also obliquely cuts off the lower part of the terminal articular surfaces, which gives to these a very square contour. The articular surfaces are both concave, the anterior very slightly so, the posterior very decidedly. In the latter surface (in the third centrum of the series) the bottom of the concavity lies 1.6 centim. ($\frac{3}{8}$ in.) in front of a plane laid through the circumference. The horizontal diameter of this surface, below the level of the transverse process, is 13.7 centim. ($5\frac{3}{8}$ in.), which is reduced to 12.7 centim. (5 in.) at its lowest limit, where it is cut off by the chevron-facet. The vertical diameter of the surface is equal to the side of the square, 11.7 centim. ($4\frac{3}{8}$ in.).

The neural canal was very small: the transverse measurement of its floor is under 3 centim. ($1\frac{1}{8}$ in.); and its height is less. The neurapophyses are stout; their attachment to the centrum is nearly coequal with the antero-posterior extent of this latter. The neural spines, strong flattened blades, having an antero-posterior expansion of 7.5 centim. (3 in.), rake backwards, and form with a plane through the neural surface of the centrum an angle of about 125° . Their length was plainly considerable: that of the best-preserved one is 19 centim. ($7\frac{1}{2}$ in.); and it has evidently been broken at some distance from its true end.

A long and stout transverse process stands off from the junction of the lateral and upper surfaces of the centrum. It is a horizontally flattened blade with a slight backward curve. Its average width is 6 centim. ($2\frac{1}{8}$ in.). The vertical diameter of the process near its root is 3 centim. ($1\frac{1}{8}$ in.), which is reduced to 1.4 centim. at the distance of 15 centim. ($5\frac{3}{10}$ in.). Its length when entire was probably not much more.

Relatively to the great bulk of the vertebræ the zygapophyses are small; the front pair project forwards and slightly outwards directly above the crown of the arch; their articular surfaces look inwards and slightly forwards. The postzygapophyses have an oval articular surface 4 centim. by 3 centim. ($1\frac{3}{8}$ by $1\frac{1}{8}$ in.).

Dislocated, but cemented to the centrum by rock, are parts of three chevron bones. In two of these, the basal end which articulated with the vertebral centrum is well preserved. It consists of two crescentic parts, of which the anterior is the larger, meeting angularly. A depression in the anterior division received a corresponding swelling in the posterior-facet of the vertebral centrum when the chevrons were articulated. The forked portion of the chevrons is 12.5 centim. ($4\frac{1}{10}$ in.) long. The undivided blade, when entire, certainly much exceeded this; and I think it not improbable that the length of an entire chevron attained 45 centim. ($17\frac{3}{4}$ in.). Other detached chevron bones have nearly the above dimensions.

In their transverse processes and chevrons we have the clue to the place of these vertebræ in the tail.

Other remains referable to *I. Mantelli* obtained by me in the same locality afford evidence that the foremost chevron bone is intercalated between the second and third caudal vertebræ, and that the second centrum has but one chevron-facet, from which it is apparent that the three vertebræ just described occurred later in the series. In *I. Mantelli*, as in *Hypsilophodon Fovii*, the transverse processes of the

first three caudal vertebræ are dwarfed; and they disappear at about the tenth centrum reckoned from the sacrum. The length of their transverse processes leads me therefore to place the three vertebræ between the fourth and ninth in the postsacral chain. Their strong resemblance to the vertebræ referred by Dr. G. A. Mantell and Prof. R. Owen to *Pelorosaurus* is very suggestive of the identity of this with my Brook Iguanodon.

Humerus (Pl. IV. fig. 6).—With the exception of the distal end, which has been crushed off, this bone is excellently preserved. Its present length is 67 centim. ($26\frac{2}{3}$ in.); 10 centim. would not be an excessive allowance for the missing part, which would make the original length 77 centim. (30 in.); but it should be understood that this is only an approximation.

The proximal half of the bone is compressed. The ventral surface of this part is hollow transversely; and the dorsal surface is convex in the same direction. The proximal end is convex; the articular surface (*pa*) is at the summit of the curve. From it is produced upon the dorsal surface of the bone, to a distance of 15 centim. ($5\frac{8}{10}$ in.), a stout, rough ridge, bounded on each side by a wide shallow groove. The posterior border of the bone is concave; and at its junction with the proximal end is an angular backward projecting process (*pp*), as in the humerus of *I. Prestwichii*.

A strong rough crest gives a convex contour to the anterior or radial border of the bone. This crest, which begins at the proximal end, subsides at the distance of 38 centim. (15 in.) from it. The broad hollow noticed in the ventral surface of the proximal end is continued down the shaft in the form of a wide shallow groove, which only disappears where the shaft begins to expand near the distal condyles. The dorsal aspect of the shaft is convex transversely. This configuration of the dorsal and ventral surfaces gives to a cross section of the shaft an oval shape, in which the curve answering to the ventral surface is indented at its middle. The chord of the proximal end is 26.5 centim. ($10\frac{2}{5}$ in.). The breadth of the bone at the most salient part of the radial crest is 21.5 centim. ($8\frac{1}{2}$ in.); and the girth of the shaft is 40 centim. ($15\frac{3}{4}$ in.).

It will be seen that the form of the proximal end of this humerus agrees with that of *I. Prestwichii**, and differs greatly from the representations of a humerus in the collection of J. B. Holmes, Esq., of Horsham, given by Prof. R. Owen in his 'Fossil Reptilia of the Wealden Formations,' pl. xiv. figs. 3, 4. These figures I never understood until, some time since, by the courtesy of Mr. Holmes, I had an opportunity of examining the specimen. Its proximal end is, in great part, a restoration in Roman cement, and "pl. xiv. figs. 4, 5. Monograph Iguanodon" are, I was informed by Mr. Holmes, copies of drawings by Miss Holmes. To the great artistic talent of this lady, her very beautifully executed and truthful drawings of fossil bones which I have seen bear testimony. I shall, however, not do her any injustice if I suggest the absence of such critical anatomical knowledge as would have enabled her to distinguish the real from the fictile parts of the bone.

Dermal Covering.—I had long possessed evidence that *Iguanodon*

* Quart. Journ. Geol. Soc. vol. xxxvi. p. 454.

had a scuted hide; but until the acquisition of these remains such evidence was very fragmentary. In cutting away the rock from the larger bones of the hind limb, I found beneath it a layer of bony tissue separated from the endoskeleton by a deeper layer of rock enclosing much black carbonaceous matter. From its position with reference to the endoskeleton it was obvious that the outer layer of bony tissue was exoskeletal—was in short a dermal mail. In order to lay bare the tibia, it was necessary to cut away a greave of such dermal covering. The scutes composing it are distinctly bony, of irregular polygonal form; some are 2 centim. ($\frac{1}{2}$ in.) thick, and 7 centim. ($2\frac{3}{4}$ in.) in diameter. Their external surface is slightly pitted.

For the *Iguanodon* indicated by these remains, the distinctness of which from those of *I. Mantelli* * is beyond doubt, I propose the specific name *Seelyi* (*Iguanodon Seelyi*), in slight acknowledgment of the great courtesy of Charles Seely, Esq., of Brook House, in permitting me to excavate the cliff for their recovery.

EXPLANATION OF PLATE IV.

- Fig. 1. The left ilium, outer view: *p*, the pubic process; *i*, the ischial process; *pa*, the præacetabular process. $\times \frac{1}{2}$.
 2. The right femur, dorsal or anterior view: *ic*, the deep anterior intercondylar groove; *i i*, the inner trochanter. $\times \frac{1}{2}$.
 3. The right tibia, anterior view. $\times \frac{1}{2}$.
 4. The fibula, outer view. $\times \frac{1}{2}$.
 5. The left foot: *m*, metatarsus; *ii*, the inner; *iii*, the middle; *iv*, the outer toe. $\times \frac{1}{2}$.
 6. The right humerus, dorsal view: *pa*, proximal articular surface; *pp*, the posterior process; *r*, the radial crest. $\times \frac{1}{2}$.

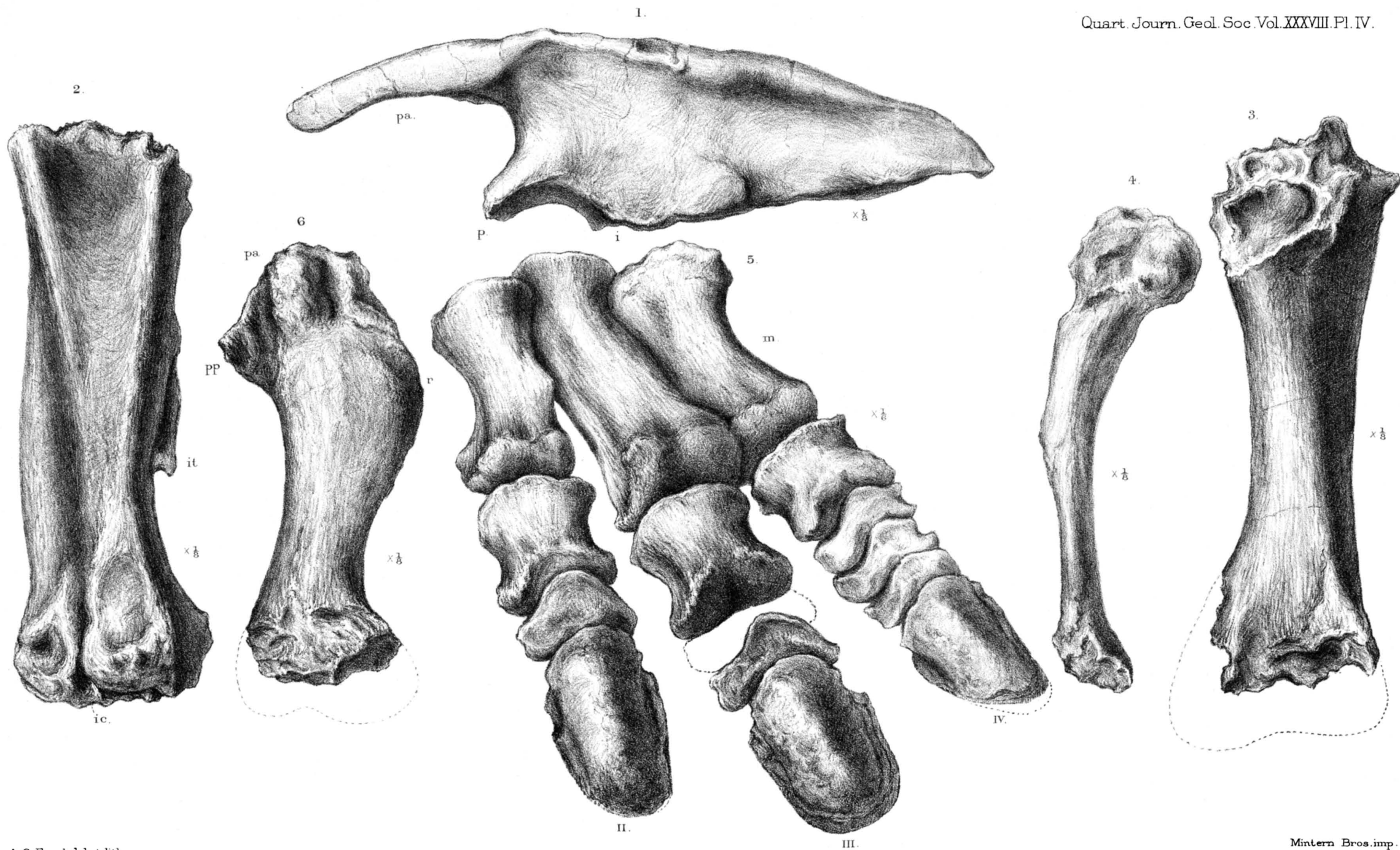
DISCUSSION.

Prof. SEELEY spoke of the important work carried on by the author, whereby genera founded on imperfect evidence had been got rid of. He doubted whether a form with an ilium so different from that of *Iguanodon Mantelli* ought to be referred to the same genus. The same doubts were suggested by the different proportions of the limb-bones, and by peculiarities of the vertebræ, as compared with those of *Iguanodon*.

Dr. MURIE thought that the foot might have been slightly webbed, and remarked that the hind limb was remarkably bird-like, as shown by the diagram; but he doubted whether the natural position of the limb-bones was that represented by the author in his restoration. He thought that the bones called by the author chevron bones in the foot might be sesamoid bones. He believed with the author that the tail was mailed.

Mr. HULKE said that he could not entertain the idea that the chevron bones on the foot could be regarded as sesamoid bones. True sesamoid bones were, indeed, present; but portions of chevron bones had been accidentally fossilized in connexion with the foot. None of the footprints showed any trace of a web. He agreed with Prof. Seeley as to the great size of the tail. With the present evidence he thought it safer to refer the form to *Iguanodon* than to create a new genus.

* The *Iguanodon* indicated by the remains in the well-known slab figured in the Foss. Rept. of the Cretaceous formations, pls. xxiii. xxiv., is taken as the type of *I. Mantelli*.



A. S. Foord. del. et lith.

IGUANODON SEELYI.

Mintern Bros. imp.