EXPLANATION OF PLATE IV.

- Fig. 1. *Thecidea Wetherellii*, magnified.
 — 2. ————, ventral valve magnified.
 — 3. ————, dorsal valve magnified.
 — 4. *Talpina ramosa*, Hag.
 — 5. Figure magnified.
 — 6 a. *Talpina solitaria*, Hag.
 — 6 b. ———— *dendrina*, Quenstedt.
 — 7. ————, figure magnified.
 — 8. Siliceous cast of Inoceramus, with *Clionites Conybearei*.
 — 8 a. *Clionites Conybearei*, cells magnified.
 — 9. *Talpina solitaria* and *Clionites Conybearei* in cavity of *Belemnites mucronatus*.
 — 10. Cells of *Clionites* in an Inoceramus shell.
 — 11. *Clionites glomerata*, in cavity of *Bel. mucronatus*.
 — 12. Pearl-like body attached to the inner shell of Inoceramus.
 — 13. Pearl-like body unattached.
 — 14. Section of ditto, showing concentric arrangement.
 — 15. Section of a Belemnite, with cavities of *Clionites*.
 — 16. Pearl-like body attached to a Gryphæa.

X.—Notice of some new Footsteps in the Bunter Sandstone of Dumfries-shire. By ROBERT HARKNESS, Esq.

THE quarry which has hitherto furnished the most numerous and well-preserved impressions of footmarks from the Bunter sandstone is Corncockle, in the parish of Applegarth, Dumfries-shire. Some few have also been obtained from the Craigs quarry near Dumfries; and recently the quarries at Locherbriggs, in the same neighbourhood, have afforded tracks of animals. To these localities there may now be added the quarry of Green Mill, in the parish of Caerlaverock, which promises to rival Corncockle both in the number and perfection of its footsteps. The nature of the sandstone in these different localities is similar, consisting of strata, made up of laminæ of brownish and red-coloured sand, regularly bedded, dipping in the same direction and at nearly the same angle; the only variation being at the Craigs quarry, where the stone is of a coarser nature than at the other quarries.

With regard to the impressions which have been obtained from Corncockle, one of them is figured in Buckland's 'Bridgewater Treatise,' and referred to a Chelonian reptile; and others are now being figured and described by Sir William Jardine in his new work 'The Ichnology of Annandale,' a publication in which the footprints are illustrated by coloured lithographs of the size of the originals, and which will form a valuable addition to our knowledge of the Triassic fauna, and be the first work devoted exclusively to Ichnology published in this country. The footsteps

to which this paper has immediate reference are procured from the quarries around Dumfries, and differ from those which Corncockle has hitherto afforded. Some of the impressions which are found in the latter locality are also common to the other quarries, but as these will be described in the work referred to, no further notice need here be taken of them.

Amongst the most common footmarks which are met with is one in which in general there is a perfect resemblance between all the impressions, so much so as to induce the spectator to arrive at the conclusion that the hind and fore feet were identical in form. On an examination of numerous specimens this opinion would be found to be incorrect; but, owing either to the nature of the substance receiving the impression, or from the structure of the animals which have produced them, it rarely happens that perfect tracks are found; the fore-feet having in general left no traces of their imprints, the hind feet only forming the impression. In a specimen in a good state of preservation from Locherbriggs quarry, in which both markings of the fore and hind feet are shown, the latter consist of a series of impressions about $\frac{3}{4}$ of an inch broad by about $\frac{5}{8}$ of an inch in length, curved gently in front, immediately within which there occur five impressions, of toes or rounded blunt claws; the two outer ones being comparatively indistinct, but the three inner ones being broad and well-marked. At the distance of less than $\frac{1}{8}$ of an inch in front of the impression of the hind-foot there is seen that of the fore one, which is less than $\frac{1}{4}$ of an inch in breadth, and commonly presents three claw-like markings running into each other at their sides. These toe or claw markings are like those of the hind impression, rounded and blunt, and afford no other characters. In the case of the hind impression, the front part of the foot is much more deeply marked than any other portion, and the sand has been thrown slightly backwards, forming an elevated curved ridge at the back part of the impression, after the manner of the tracks which are formed by walking on snow. The interval which separates the impressions of one hind-foot from the other is about an inch, and the space between each of the impressions of one foot is about 2 inches. The distance between the right and left fore-feet markings is greater than between the hind impressions; but this results from the comparatively small size of the former.

This track indicates an animal of small size, but broad in proportion to its length, having its anterior extremities small, and its posterior ones largely developed. On the whole the characters are such as bear relation to *Chelonia*, and the animal probably bore some relation to the *Chelichnus Duncani*, Owen, found at Corncockle, but was probably distinct in species. It is common

at Locherbriggs, Craigs and Caerlaverock, and rarely exceeds the dimensions before given, and to distinguish it may be called the *Chelichnus plancus* from its broad hind-feet.

Another form of impression which has been only very recently obtained from the Green Mill quarry, Caerlaverock, is composed of a series of steps, consisting of markings of thick, rounded, blunt claws or toes. The steps, of which a slab in my possession affords eleven on each side, differ on the one side from those on the other. Those on the right side are formed of three indents, arranged almost in a line, but having the centre one slightly in advance of the other two. Behind the centre and the outer ones another marking similar to those in front occurs, and about the same distance from them as they are from each other. The diameter of each of these circular markings is about $\frac{1}{8}$ of an inch; and those on the left side differ from those on the right in having the hinder indents behind the inner one instead of between the outer and centre ones. The indents in all the impressions are marked in front by a slight elevation, which extends for a distance equal to about their diameter before them; and which appears to have arisen from the portion of the foot which caused the indents having been thrust obliquely forwards. The difference in the position of the hinder indent has probably been caused by one of the toes in each foot not having left its impress. No other portion of the foot has caused any marking, each step consisting solely of four claw-like impressions. The distance which separates the steps on each side from each other is less than the space occupied by the three front indents of each foot, being under an inch; and the interval between the prints on the right and the left side is about 2 inches, exceeding the space occurring between the steps on either side by more than double the distance.

From the impression as seen on the slab it would seem that the hind and fore foot were similar not only in form but also in size, both being large; and the evidence which the impressions afford is such as to show that the animal which formed them was of much greater breadth than length. Altogether the character of the footprint, and the great distance between the feet on the right and those on the left side, show resemblance to a Chelonian form; but this form was widely different from the one before alluded to, being apparently more nearly allied to *Tes-tudinata* than the previous footsteps.

From the tortoise-like form of this step I propose to call it provisionally the *Chelaspodos Jardini*, the specific name being in honour of Sir William Jardine, Bart.

On a slab of sandstone from the same locality as the before-described impression there are seen two distinct kinds of steps;

one of these is of an elongated form, rounded at the anterior extremity, and immediately within this extremity there are seen impressions of either toes or claws. Two of these on the outer side are shallow and comparatively indistinct; the one in front is deeply impressed, and the inner one contiguous to it is also well marked. Traces of a fifth may also be seen, but owing to the nature of the sand, when the animal passed over it, not being in a condition to receive a perfect impression, these steps are not distinctly shown. From the raised margin in front of the claw-like markings gradually disappearing behind, it would seem that the animal in its progress had pushed the sand forwards by the sloping manner in which it set down its feet. The breadth of this form of step is about $\frac{1}{2}$ an inch, and as only the front and a portion of the sides are seen, its length cannot be determined. There are only four impressions on the slab, and the interval between each of these about 8 inches. The position of the steps is slightly inclined outwards, but as these are in a line they seem to belong to one side only, and have probably been produced by the same foot; and as no other impressions of the same nature have been obtained, no conclusion can be arrived at concerning the form and size of the animal which produced this form of footprint.

The character of the step appears somewhat allied to the *Chelichnus*, and in order to distinguish this form it may be named the *Chelichnus obliquus*, from the oblique direction of the steps.

The other form of impression which is associated with that just described, shows characters which will remove it from *Chelonia*, and which seem to place the animal which caused it amongst Saurians.

This impression consists of a line of steps which are furnished with well-developed toes, three of which are very distinct, and two others can also be traced. The marks caused by the toes are much deeper and in a better state than the other parts of the foot; but in one case the impress of the posterior part of the foot is sufficiently perfect to show that it had a rounded form, and was less than an inch in length, including the toes, which are themselves about $\frac{1}{2}$ an inch long; these being broad at their base and tapering rapidly towards the extremity, which is pointed. The nature of the impressions is such as to show that these toes were curved; and the step is devoid of the raised parts which are seen before the claws of the two preceding forms of footmarks, and appears to indicate that in progression the foot was put perpendicularly downwards. The direction of the steps is inclined to the path of the animal, and the interval which lies between them is about 6 inches. These steps, like the preceding form, occur in a line, and are those of one side only; they also seem to

have been formed by the same foot, and therefore no inference can be drawn from them concerning the creature by which they were made: the elongated toes however seem to show some analogy to lizards, and therefore it is proposed to form a genus called *Saurichnis* for this form, and in consequence of its pointed toes to term it *S. acutus*.

There has been found at the Craigs quarry, not on the surfaces of the beds, but on the faces of the laminæ when the sandstone is divided, several indistinct impressions of various forms which the nature of the sandstone does not allow of being properly recognised. Along with these a form of footstep has been seen differing from those of the other localities, having an elongated form, about an inch in length, and broader at the anterior extremity than at the posterior. The space between the steps on one side is about 6 inches, and the interval between the corresponding impression on the right and on the left side is so small in comparison with the distance which occurs between the steps on the same side, as to show that the animal which formed them was of a long and narrow shape, and probably had a lacertian nature; and perhaps was allied to the genus *Herpetichnus* which is found at Corncockle. Owing to the imperfect state of this footprint it would be premature to assign to it any name, and perhaps other impressions may be found which will enable us to trace out its affinities.

About a month ago very perfect impressions of a batrachian foot were found at Green Mill, Caerlaverock, being the first which has been noticed in the quarries around Dumfries. In this instance both the hind and the fore feet have formed beautiful imprints. The former have the five toes distinctly visible, and the form of the sole of the foot is equally well seen. Its length is nearly an inch and a quarter, and its breadth about an inch. The hind part of the posterior impression has a curved form, resembling a segment of an ellipsis cut across the minor axis; and the toes spread outwards and are thick; the longest one being about twice the length of the sole.

Immediately in front of the hind footmark the impress of the small fore-foot is seen, consisting of five thick, short toe-marks, having a depression behind them. The length of the stride appears to have been about 3 inches, and the space which separates those on one side from those on the other is about 2 inches. The portion of the foot which has pressed most heavily on the sand is the hinder part, which has caused a deep indent and forced the sand forwards and upwards; so that while the heel is deeply impressed, the toes are above the level of the surface of the plane over which the animal traversed, showing that the hind part of the foot came in contact with the ground first.

This impression seems to belong to the *Labyrinthodon*, but differs somewhat from those of the Bunter sandstone of Cheshire, appertaining probably to another species. I propose therefore to call it the *L. Lyelli*.

Another impression which seems to partake of a batrachian character is common at Green Mill; but the animal which has caused it having been apparently of small size, the steps are rather indistinct. In this case the same difference obtains between the impress of the fore and hind step as marks the foregoing form. In the hind footmark three toes usually occur, two of which are longer than the sole of the foot, and the other about the same length. Traces of two other toes are in some instances visible; but these are small, and occur one on the inner side and the other on the outer side of the impression. The whole length of the foot is commonly less than an inch, and its breadth about $\frac{5}{8}$ of an inch. About $\frac{1}{4}$ of an inch in front of the larger impression are seen the marks of the fore-feet, which are in the form of indents; but in some cases they present a foot-like marking resembling the fore-step of the *Labyrinthodon*. The length of the stride is about 3 inches, and the space between the impressions on the right and those on the left side is about 2 inches, distances somewhat similar to those in the preceding batrachian; and the form of the step is such as to show some analogy between these two forms. The characters are however not such as to lead to the conclusion that the impression belongs to the *Labyrinthodon*; and I propose to term this form of step *Batrachnis*, giving to this impression the name of *B. Stricklandi*, after Mr. Strickland, who has at different times noticed the ichnolites of Dumfries-shire.

XI.—*A Catalogue of British Spiders, including remarks on their Structure, Functions, Economy and Systematic Arrangement.*
By JOHN BLACKWALL, F.L.S.

[Continued from p. 44.]

62. *Clubiona lapidicolens*.

Clubiona lapidicolens, Walck. Hist. Nat. des Insect. Apt. t. i. p. 598.
— *lapidicola*, Latr. Gen. Crust. et Insect. tom. i. p. 91; Sund.
Vet. Acad. Handl. 1831, p. 139; Hahn, Die Arachn. B. ii. p. 9.
tab. 40. fig. 100.

The claim of *Clubiona lapidicolens* to a place among British spiders rests on the authority of Dr. Leach. See the Supplement to the 4th, 5th and 6th editions of the 'Encyclopædia Britannica,' article Annulosa.

Harkness, Robert. 1851. "X.—Notice of some new footsteps in the bunter sandstone of Dumfries-shire." *The Annals and magazine of natural history; zoology, botany, and geology* 8, 90–95.

<https://doi.org/10.1080/03745486109494966>.

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DOI: <https://doi.org/10.1080/03745486109494966>

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