

NOTES ON THE DISCOVERY OF A GANOID FISH
IN THE KNOCKLOFTY SANDSTONES, HOBART.

BY MESSRS. R. M. JOHNSTON AND A. MORTON.

TWO PLATES.

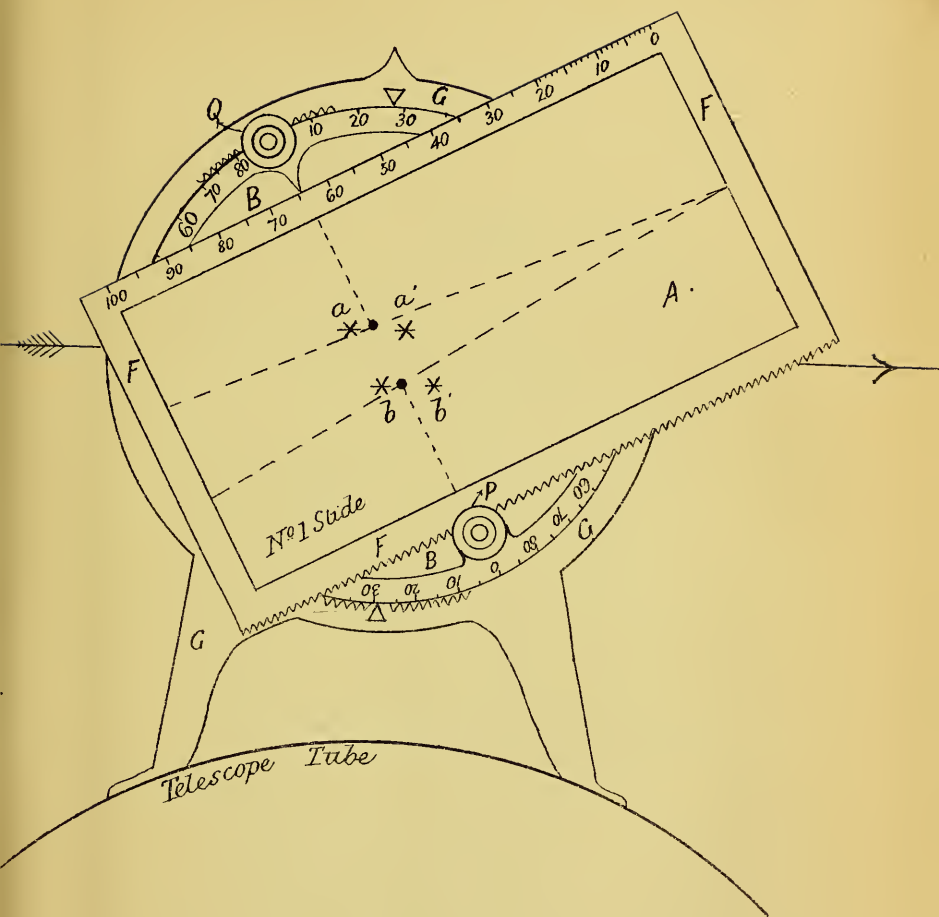
The recent discovery of the very perfect remains of a Ganoid Fish, closely allied to the genus *Acrolepis*, in one of the beds of the Knocklofty sandstones, is of the greatest interest. Several fossil fishes are said to have been found previously in the flagstone quarry near the Cascades, but, unfortunately, the quarrymen regarded them as being of little or no importance, and although, from curiosity, one or two specimens had been preserved for a time by one of the workmen, they were soon lost or thrown away. The specimen now referred to was discovered by Mr. H. Nicholls, who, with commendable thoughtfulness, at once presented it to the Tasmanian Museum.

Fortunately the casts of the specimen are remarkably perfect. The only parts imperfect, or missing, are the ventral fins, part of the anal fin, and the anterior part of the head. The strongly pronounced heterocercal tail and the scales of the body are remarkably well preserved. The following is a description of the fish, which is named, provisionally, in honour of His Excellency Sir Robert Hamilton, to whom, as its President, the Royal Society is so much indebted for the enthusiastic manner in which he has ever promoted its interests.

ACROLEPIS ? HAMILTONI, Johnston and Morton.

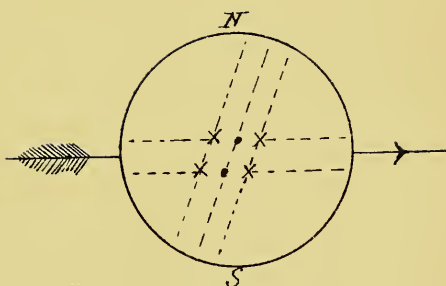
Body compressed, elliptical, elongate; length from snout to end of caudal fin about 7 inches; length of body $5\frac{3}{4}$ inches; depth at a vertical line through occiput, 12 lines, increasing to 14 lines at greatest depth near ventrals, and from thence gradually tapering to peduncle, where it measures 5 lines; length of heterocercal tail—which is inclined upwards at an angle of about 22 degrees—14 lines; length of lower ray lobe of caudal, 5 lines; length of head about $1\frac{1}{4}$ inches, or scarcely one-sixth of the total length; length of dorsal, about 8 lines; fin low, with fine rays, probably 15 or 16; anterior end situated about 39 lines from end of caudal, and the posterior distant about 31 lines from the same point. The anal fin is inconspicuous and imperfectly preserved, but it appears to be similar to the dorsal, and it is situated fully half the length of that fin nearer the tail. The ventrals are

FIG 1 (PAGE 3)



The Arrow shows the path of the Star across the field

FIG 2



• The "Ghost"

^{x x}
x x The star passing the "Ghost"

FIG3 PAGE 4

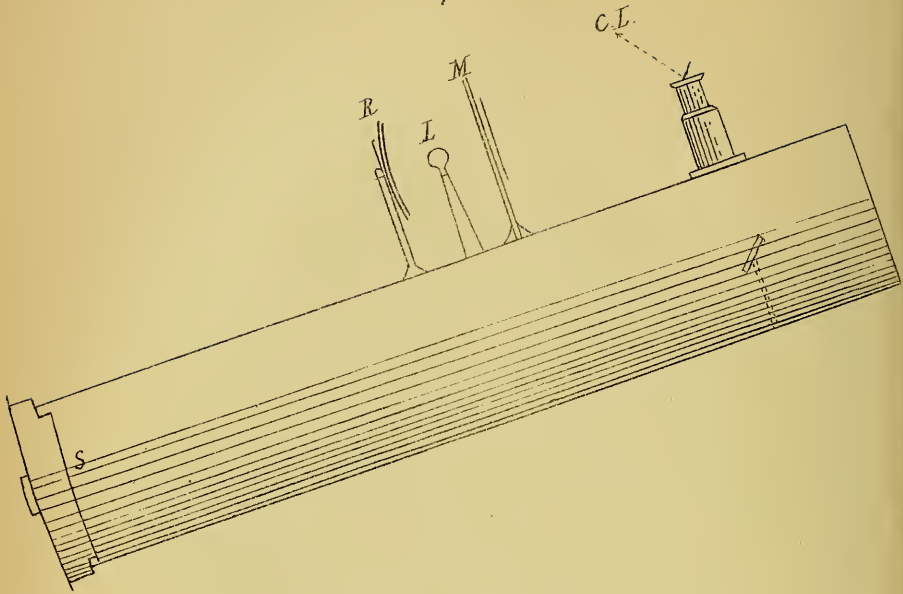
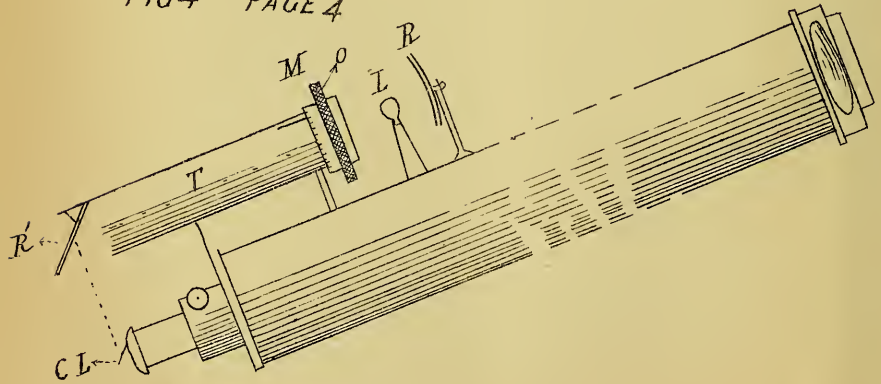


FIG4 PAGE 4



scarcely visible, but appear to be small; and the root is only about 10 lines distant from a vertical drawn through posterior portion of head. Pectorals about 7 lines in length, and consists, apparently, of about 15 slender rays.

There are 56 rows of small rhomboid scales, longitudinally arranged in an inclined dorso-ventral series; the caudal series being more perceptibly angled than the anterior series. The inner surface of each scale is alone visible, from which it clearly appears that each one is finely ridged longitudinally, as in the scales of *Acrolepis*. There are usually 4 slightly curved ridges, radiating longitudinally from posterior angle of rhomboid scale to the two inner ones, almost invariably becoming furcate as they approach anterior inner margin; the outside one on either side smaller and almost invariably simple. The upper margin of tail is markedly serrate, indicating the presence of numerous pointed fulcral scales.

The only Australian fish which appears to come near it is the well-known *Myriolepis Clarkei*, Egerton, but it is evident from the description and drawings that the Tasmanian Ganoid has relatively much smaller fins, and the scales, though belonging to a specimen half the size, are relatively much larger and consequently less numerous.

AGE OF THE ROCKS IN WHICH THE FISH REMAINS OCCUR.

The discovery of this interesting fossil is another proof of the aqueous origin of the important series of sandstone beds, of which the section from Cascades to Knocklofty affords the best and most fully developed example. Although the shales contain impressions of what appear to be fucoids, the evidences are not sufficient to determine whether these basins were estuarine or lacustrine; or whether the waters were fresh, brackish, or salt. Ganoid fishes of the period are found under all such conditions; and therefore their discovery in such deposits prove little further than to indicate the *aqueous* origin of the beds in which such remains occur. It is most probable that the waters were of the nature of brackish lagoons. The exact position of these sandstones in relation to the Mesozoic Coal Measures, on the one hand, and the Upper Paleozoic Mudstones, on the other, has ever been one of much doubt.

It is true a similar series of sandstones at Adventure Bay appear to immediately succeed the Upper Carboniferous Coal Measures without any sign of stratigraphic break; and again at Passage Point this succession appears to be very complete in immediate relation to beds of the Upper Marine series. But the absence of fossil evidence, and the manner in which the several deposits are separated from each other, by distance or faults and intrusive rocks, make it a doubtful

matter whether these apparently similar formations are, in reality, members of the same horizon. The evidence of breaks in the series at Knocklofty, and on the Huon Road near the Old Toll Bar, also adds perplexity when relationships are sought to be established. And much observation is yet needed before it is possible to satisfactorily determine the true relations of the various separated sandstone formations, lying either between the Upper Paleozoic Mudstones or Upper Carboniferous Coal Measures, and the Coal Measures of Mesozoic Age.

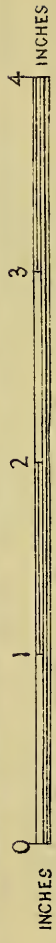
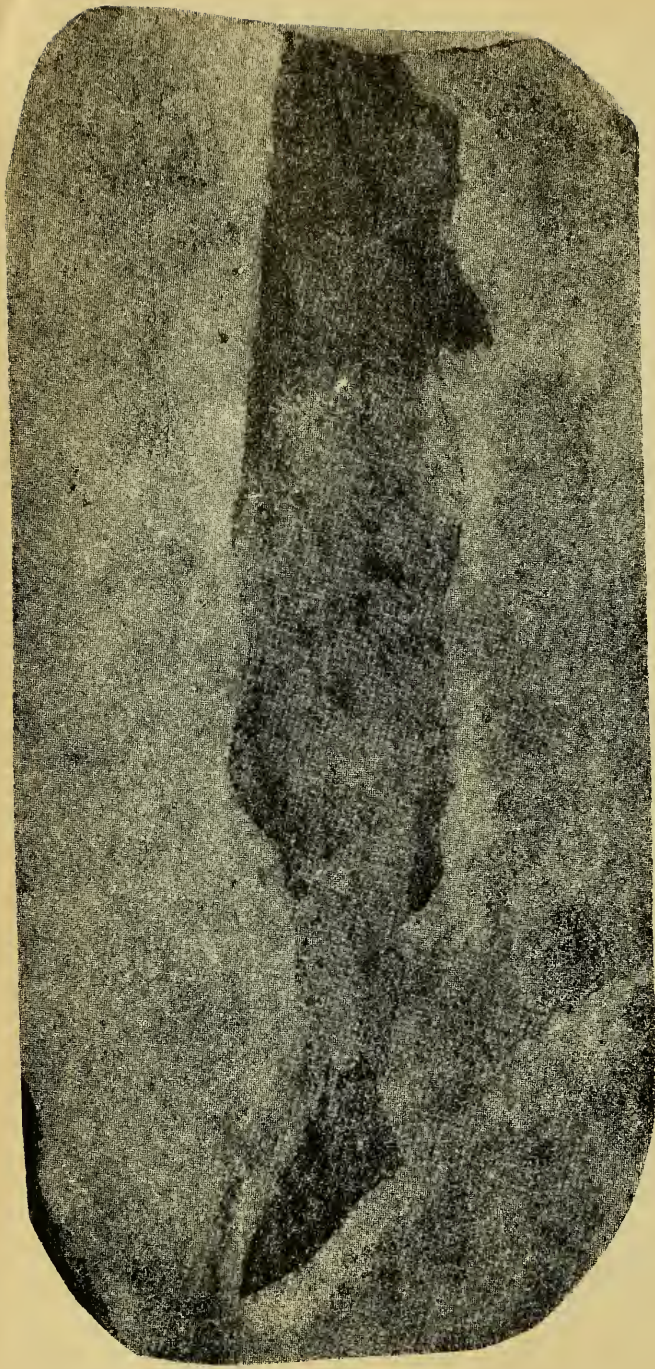
SECTION FROM THE CASCADES TO KNOCKLOFTY.

The series of sandstones and shales between the bed of the creek at the Cascades, and the blow of intrusive greenstones forming a conical knoll above the highest sandstone quarry on Knocklofty, is about 800 feet thick, measuring from the bed of the creek. At this point it is not known to what depth the series extend, but it is probable the thickness altogether will exceed 1,000 feet.

The following is a description of the series exposed, taken in ascending order:—

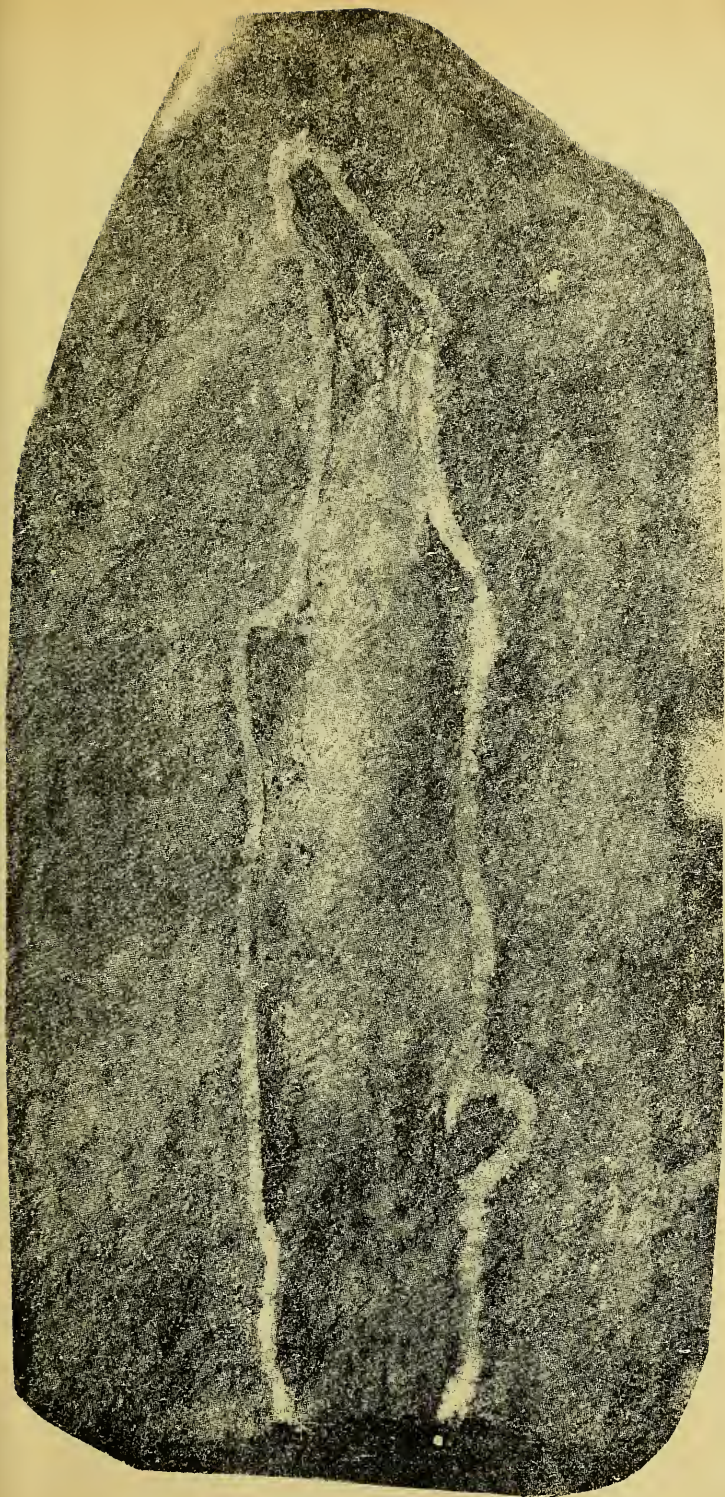
- | | | |
|---|--------|-----|
| 1. Yellow fissile sandstones, splitting up into thin evenly bedded flagstones | ... | 20 |
| 2. Greyish or blackish micaceous bed of flaggy sandstone, with hardened ferruginous nodules, sometimes enclosing remains of fossil fish | | 5 |
| 3. Friable mottled shales—green, red, or yellow—with obscure impressions of minute strap-shaped plants (apparently slightly unconformable with No. 3) | ... | 60 |
| 4. Thick bedded sandstones—white, red, and yellow, worked throughout for building stone with thin bands of fine friable yellow or grey shales intercalated irregularly at intervals | | 715 |

Total Thickness 800



SCALE

ACROLEPIS HAMILTONI. Johnston and Morton.



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