claw. This digit is well shown in the right wing represented in Fig. 1, and also in the restoration, given below, Fig. 3.

In the restoration here attempted, the writer has endeavoured to reproduce (1) the parts actually present or clearly indicated in the specimen described, and (2) those which the former seemed to require to complete the outward form in life. The membrane at the base of the tail may have been somewhat less in extent, and the fold of the skin above the fore-arm either more or less developed than here represented, but the facts now known render the outlines here given more than probable. The hands are represented with the palms forward.

FIG. 3.—Restoration of *Rhamphorhynchus phyllurus*, Marsh.
One-seventh natural size.

The present species appears to be most nearly related to *Rhamphorhynchus Gemmingi*, von Meyer, from the same geological horizon, and near the same locality. That it is quite distinct, however, is shown, aside from the difference in size, by the complete ankylosis of the scapula and coracoid, and by the fifth digit of the hind foot being well developed, and having three phalanges. In the name *Rhamphorhynchus phyllurus*, here proposed for the species, the latter designation refers to the leaf-shaped caudal appendage, which appears to be one of its most characteristic features.

For the long delay in the description of this important European specimen, the writer can only plead *l'embarras des richesses* nearer home.

YALE COLLEGE, NEW HAVEN, March 14, 1882.

III.—NOTE ON THE SO-CALLED "HYPERSTHENITE" OF CARROCK FELL, CUMBERLAND.

By CHAS. O. TRECHMANN, PH.D.

THROUGH the kindness of Mr. J. J. Harris Teall, F.G.S., I have been enabled to examine a hand-specimen of the above rock, gathered by himself at a point about half-way between the village of Mosedale and the summit of Carrock Fell. In general appearance it coincides with the white or grey variety of the hypersthenite of

Mr. J. C. Ward,¹ and which is described by him generally as "a coarsely crystalline compound of plagioclase felspar and hypersthene, with scattered grains of titaniferous iron oxide, and more or less quartz," remarking that "the hypersthene may be replaced by a hornblendic mineral or may occur in conjunction with it." It is a rock of rather coarse grain, consisting macroscopically of dull white crystals of plagioclase felspar with a greenish or bluish-green cast, some parts clear and vitreous with twin striations; very dark olive-green diallage in irregular grains, occasionally forming crystalloids with definite outline up to one-quarter of an inch in length, and rarely with any distinct metallic lustre on the cleavage faces (Mr. Teall states that the metallic lustre is pronounced in the weathered parts of the rock); large black grains and octahedrons of magnetite, perhaps in part ilmenite; a considerable quantity of white or greyish quartz in large grains; a soft micaceous decomposition product of paler colour than the diallage; lastly, a few minute elongated hexagonal crystals of a transparent light grass-green and rather soft mineral, which appears to be apatite.

The felspar is kaolinized on the weathered side of the specimen, leaving the diallage in a soft brownish-green altered condition, apparently serpentized.

The microscopical analysis of a section cut from the specimen gave the following result:—

1. Plagioclase, probably labradorite, in large crystals, which were highly altered to a yellowish fine-grained substance, with aggregate polarization, and here and there intersected by fine veins of chlorite or serpentine, leaving clear and perfectly fresh portions made up of broad twin lamellæ, crossing one another in two directions. The dark microliths so common in labradorite are wanting.
2. Diallage in irregular patches, finely striated by cleavage fissures and dark interpositions. Faint cleavages in other directions also visible. Some parts, especially near the edges, were without interpositions. No twins. Colour pale brown, no pleochroism, active polarization, like augite. Occasionally a lamellar polarization, probably due to alteration. In sections more or less parallel to the klinopinacoid the position in which extinction took place between crossed Nicols gave angles varying between $23\frac{1}{2}^\circ$ and $30\frac{1}{2}^\circ$ with the vertical axis, i.e. direction of striation, of the crystals. No hornblende in conjunction with diallage.
3. Hornblende (?). A few minute grains were strongly pleochroitic, from bluish-green to yellowish-green, distinct cleavage and a somewhat rough surface. Extinction gave 9° with the direction of vertical axis. This may be hornblende.
4. Serpentine. A large portion of the augitic or hornblendic constituents of the rock is more or less completely altered to bright green serpentine, slightly pleochroic with aggregate polarization; a part may be chloritic.
5. A micaceous mineral is represented by a small number of minute irregular grains with wavy black striations. Dichroism distinct, dark bluish-green and yellowish brown. Extinction

¹ On the Granitic, Granitoid and Associated Metamorphic Rocks of the Lake-district. Pts. iii.—v. Quart. Journ. Geol. Soc. vol. xxxii. (1876) p. 21.

guishing parallel with the striæ. 6. Quartz, interstitial in large quantity running in irregular bands through the section. It frequently had the broken-up appearance of quartz in "Schriftgranit." Minute fluid lacunæ with fixed and mobile bubbles. The high percentage of silica in Mr. Ward's analysis is hereby easily accounted for. 7. Magnetite in large crystals and irregular grains. 8. Apatite. A few colourless grains with regular outline agreed with the microscopic appearance of this mineral. A chemical test revealed the presence of phosphoric acid. Olivine was not observed.

With exception of the serpentinized portions, the number and size of the fragments of the oblique diallage preponderated to such an extent over anything that might be construed as hypersthene that the rock from which our specimen was taken seems undoubtedly to be a gabbro and not a hypersthene. The question of the existence of the latter in the Carrook Fell district cannot, however, be regarded as solved, until a more extended examination has been made of the different occurrences of this interesting rock.

IV.—SUPPLEMENT TO A CHAPTER IN THE HISTORY OF METEORITES.

By WALTER FLIGHT, D.Sc., F.G.S.

(Continued from p. 170.)

1877, January 3rd (Sunrise).—Warrenton, State of Missouri.

[Lat. $38^{\circ} 50'$; Long. $91^{\circ} 10'$.]¹

A sound like that of a cannon ball passing through the air was heard by four observers near Warrenton. On looking up they saw an object falling, which struck a tree, breaking off the limbs, and then coming to the ground with a crash. The observers were fifty or sixty mètres distant from the spot where it fell. The snow was melted where it fell. From the fragments found, it appears to have had a conical form, and to have been about eighteen inches in length. The pieces, although warm, were easily handled. It is estimated that the stone weighed about one hundred pounds, but only about from ten to fifteen pounds weight have been preserved.

In one specimen the fibres of some of the branches are found adhering to the rough crust of the stone, and these delicate fibres show not the slightest sign of having been heated. No luminous phenomena attended the fall, which appears to have been slow; "it was no doubt a meteorite well spent in its rapid motion through the atmosphere." Its direction, as far as it could be ascertained, was from N.W. to S.E.

The stone differs in a marked degree from the one just described, although it also is pisolitic and fell only a few days previously. It closely resembles the Ornans meteorite, which fell 11th July, 1868, and the results of Dr. Smith's analysis closely accord with those found by Pisani² on analyzing that stone.

The crust in this case is unusually thick, being in some places from two and a half to three and a half millimètres in thickness.

¹ J. L. Smith, *Amer. Jour. Sc.* 1877. xiii. 243; and xiv. 222.

² *Compt. rend.* 1868, lxvii. 663.