

## NOTE ON THE CONTENTS OF THE POCKETS IN THE CARBONIFEROUS LIMESTONE AT LLANDUDNO.

To the Editor of the GEOLOGICAL MAGAZINE.

SIR,—An examination of the contents of the pockets in the Carboniferous Limestone near Llandudno has brought to light some few fossils that may tend towards solving the problem of the origin of these curious accumulations. A reference to Mr. Maw's paper on the same subject in Vol. II., No. 4, of the GEOL. MAG., will give a clear description of the general character and position of the deposits. Those which I examined are three in number: one near the Little Orme, at Nant y Gamer, and two on the Great Orme, close to Wyddfyd Farm. At the former locality there are two large pockets known; one of these, the upper one, is now nearly emptied and is abandoned, the other is an open pit of considerable size, reached by an adit driven in the hill-side through the Boulder-clay drift and the limestone rock beneath. This pit contains, immediately beneath the drift and sharply contrasting with it, some ten yards of beautifully white sand, mixed in places with equally white clay; the clay is also here and there variegated with red; it forms the floor of one side of the pit, and its thickness has not been ascertained. In the sand there is in one place a thickish kind of vein, consisting for the greater part of oxide of manganese; it is amorphous and pulverulent; this is said to extend beneath the floor to a depth not yet known. On looking over the clays and sands in this pocket I found traces of fossils, chiefly in the former; portions of Encrinites were tolerably plentiful, apparently derived from the Carboniferous Limestone, the other fossils were not so distinct, but may be parts of Producti; they were very fragile. The white clay was in places filled with pieces of white chert, and some of the fossils may have come from this, as I have no doubt this chert and that also at the base of the Boulder clay on the shore, is derived from the Limestone, although I could find none *in situ* in the neighbourhood. Some of the Limestone forming the walls of the now abandoned pocket is very curiously banded with white and red; it is rather shaly or fissile, and is also here and there slightly silicious; it contains many crinoidal and other fossil remains. How far back towards the old pocket the lower one may extend is not yet known; it is not improbable that the two may be connected.

On examining the deposits of fire-clay with sand and chert at Wyddfyd Farm, I found in the sand, or rather sandy clay, which overlies the thick clay, very numerous pieces of chert, some of large size; these undoubtedly belong to the Carboniferous Limestone, for they are crammed with casts of Encrinites, and resemble closely what in Derbyshire are called "Screw-stones." The chert is whitish or drab, but is often very much decomposed and yellowish, and crumbles very readily into a kind of sand. Is it impossible that the sands in the pockets may thus have had their origin? The sand a little beyond Wyddfyd Farm contains very many joints of Encrinites, besides traces of other fossils. One piece of sand, I found, has

a tolerably distinct impression of a fossil shell in it, which may perhaps be sufficiently distinct to enable its name to be ascertained. Fragments of Carboniferous Limestone were not uncommon in this sand-pit. From its position it is not easy to say for certain whether it overlies or underlies the clays at Wyddfyd Farm. It has been dug into to a depth of some eight or nine feet. I have sent specimens of all the above-mentioned deposits, in the hope they may throw some little light upon their origin.

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### MISCELLANEOUS.

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DISCOVERY OF A NEW MINERAL ("CROOKESITE").—Whilst examining the seleniferous minerals from the Skrikerum mine, in Sweden, M. Nordenskiöld has discovered that thallium exists in small quantities in eucairite (Cu Ag Se) and berzelianite (Cu Se). Continuing his researches among these selenides, in Mosander's collection, he has found a mineral which contains from seventeen to nineteen per cent. of this metal. It occurs in small opaque masses, having a metallic lustre and lead-grey colour, mixed with the grains of eucairite and berzelianite. From these it is easily separated, and on analysis gives the formula (Cu, Tl, Ag) Se. Density = 6.9. No crystalline faces yet observed. Before the blowpipe it fuses easily into a shining greenish-black enamel, and the flame is coloured intensely green. Insoluble in hydrochloric acid, but nitric acid dissolves it completely. M. Nordenskiöld has named this new mineral "Crookesite," after the well-known discoverer of thallium. But few specimens have been yet found of Crookesite, but M. Nordenskiöld hopes to obtain more by carefully searching the Skrikerum mine, which has been for some time abandoned.—T.D.

A KING-CRAB IN THE UPPER SILURIAN.—Among the fossils exhibited by Mr. Robert Slimon at the meeting of the British Association in Dundee, and collected by him at Lesmahagow, in Lanarkshire, was a minute form of Crustacean, nearly allied to *Belinurus*, in which all the body segments appeared to be free and unanchylosed. In calling attention to this beautiful little fossil, Mr. Woodward pointed out the great interest attaching to its discovery, as being the oldest representative of the *Xiphosura*, or King-Crabs, known, carrying this division back in time from the Coal-Measures to the Upper Silurian.

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#### Erratum in Mr. Forbes' Article in the October Number.

On p. 443, in footnote, in line 21 from foot of page, for "before," read *after*.