of percussion have been found in all the gravels except the oldest. The value of these flakes as evidence is disputed.

4. "The *Globigerina*-marls of Barbados." By G. F. Franks, F.G.S., and Prof. J. B. Harrison, M.A., F.G.S. With an Appendix on the Foraminifera by F. Chapman, F.R.M.S., A.L.S.

After a reference to previous publications on the island by one of the authors and Mr. Jukes-Browne, an account is given of the tectonic structure of Bissex Hill, on which the principal exposures of the *Globigerina*-marl occur. Five faults are described, four of which cut all the rocks, while the fifth disturbs the Scotland Beds and the Oceanic Series, but leaves the overlying *Globigerina*-marl undisturbed.

The general succession is as follows:—The Scotland Beds are overlain unconformably by the Oceanic Series, which shows the usual succession from chalks to calcareo-siliceous beds, and in places to the upper chalks, the overlying red clays being absent. Then follows unconformably a detrital bed of *Globigerina*-marl containing rolled pebbles of various parts of the Oceanic Series, especially the chalks, and inclusions of clay presumably from the Scotland Beds. The bed is followed by buff marls, granular in appearance, and this, again, by marls and limestone, in the upper part of which *Globigerinæ* die out and are replaced by *Amphistegina* and fragments of lamellibranch shells. The whole succession is about 90 feet in thickness, and the beds pass up into basement-reef rocks without coral, and coral-rock.

Somewhat similar rocks were met with in a shaft at Bowmanston, and they probably occur in other localities. The presence, succession, and relations of these rocks enable the authors to draw conclusions as to the history of the island.

In the Appendix a list of 146 species of foraminifera is given: 15 of these occur only in strata ranging from the Cretaceous to the Pliocene Period. The rocks bear some resemblance to the limestones and marls of Malta and to the *Globigerina*-beds of Trinidad; the recent foraminifera indicate that the deposit was formed at a depth of about 1,000 fathoms and at some distance from land.

CORRESPONDENCE.

EBBING AND FLOWING WELLS.

Sir,—At the meeting of the Geological Society of London, on April 20th, 1898, were read notes on the ebbing and flowing well at Newton Nottage, Glamorganshire, by Mr. Madan, M.A., communicated by Mr. A. Strahan, M.A.

The well lies about 500 yards from the sea, with sandhills between, and in the neighbourhood of a range of Carboniferous Limestone, whilst the same formation crops out in the sea at half-tide level. At the shore junction of conglomerate and limestone numerous springs occur, and it is in this conglomerate that the well is sunk. After many observations, the author has constructed

a curve showing the relationship existing between the rise and fall of the tide and that of the water in the well. From the position of the well in question and its surroundings, possibly the ebbing and flowing of the tide may produce the ebb and flow of water in the well, but there are other ebbing and flowing wells so situate that tidal variation can have on them no influence. Some few years back I was staying at Buxton, and frequently walked to Castleton. By the side of the road I noticed an ebbing and flowing well, but the variations of condition did not assert themselves at stated or defined times; on the contrary, the changes were erratic. One thing is certain, tides could here have no effect, since, as the crow flies, the distance from the estuary of the Mersey, the nearest point to the sea, is upwards of forty miles. How, then, can these variable conditions be explained? On the spot I could collect no information. The theory I propounded was this. The district is Lower Carboniferous Limestone, and, taking into account the results of the chemical action of underground water, the internal composition of the rocks become altered, large quantities are carried away, with the result that subterranean tunnels and cavities are formed, and if in the upper parts of this mountain limestone a spring or springs exist, the overflow would find its way by tunnels into the eroded cavities, from which it might be syphoned to the well below, producing the changes which perplex the traveller.

Caverns are abundant in the Carboniferous limestones. There is the peak cavern at Castleton. The Victoria Cavern, at Settle, Yorkshire, contains forms which favour my theory, since it has deep shafts and caverns inclining inwards. There is also recorded a fissure communicating with a basin in the limestone at Windy Knoll, near Castleton.

T. E. KNIGHTLEY.

106, CANNON STREET, E.C.
May 19th, 1898.

SACCAMMINA CARTERI AND *NODOSARIA FUSULINIFORMIS*.

SIR,—In consequence of the paper by Mr. F. Chapman, in the Annals and Magazine of Natural History for March, 1898, in which he so properly connects *Saccammina Carteri* with *Nodosaria fusuliniformis* of M'Coy, I have sought for the second type-specimen referred to by M'Coy. It has now been placed in the wall-case containing fossil Foraminifera in the Museum of Science and Art, Dublin. It fully justifies Mr. Chapman's published conclusions, which were based upon the Cambridge specimen. There seems no doubt that we must now accept *Saccammina fusuliniformis* as the name of this well-known species.

GRENVILLE A. J. COLE.

SCIENCE AND ART MUSEUM, KILDARE STREET, DUBLIN.
May 21st, 1898.

BOULDERS OF SPILSBY SANDSTONE.

SIR,—In his interesting note on a boulder of Spilsby Sandstone, at Wimpole, in Cambridgeshire (GEOL. MAG., June, 1898, p. 267), Mr. Cowper Reed rightly observes that no block so large, and bearing such a definite proof of its origin, has previously been