

gabbro-like type to the finest schists, and some of the rocks are vesicular. The rocks are frequently foliated.

The crush-conglomerates have been observed in the limestones, quartzites, and epidiorites; but they are most conspicuously developed at the junction of rocks of dissimilar character, and especially when the limestone and epidiorite are in juxtaposition. The junction of the two rocks is intricately folded: folded knobs of epidiorite measuring from a few inches to a foot or more being packed together in a limestone matrix. In the sections big blocks may be seen in process of division by shearing movements, which have succeeded the folding. The limestone seems generally to have played the part of a plastic body, and has accommodated itself as a matrix to the folded and isolated fragments of epidiorite, between which it has been squeezed. Thus the origin of the conglomerate is satisfactorily proved by the fact that it contains fragments of rocks newer than the sediments in which the crush-conglomerates are embedded. The author considers that it would be safer to regard such conglomerates in this area as have a calcareous matrix as having been formed by crushing.

CORRESPONDENCE.

THE *MAMMILLATUS*-ZONE IN EAST SURREY.

SIR,—In a short communication to this Magazine for May, 1899 (pp. 234–5), evidence was brought forward of the persistence of the zone of *Hoplites interruptus* along the Gault outcrop through Kent and Surrey. Since then Mr. Jukes-Browne's valuable memoir on the English Gault and Upper Greensand has appeared, and in this certain beds at the extreme base of the Gault in West Kent and East Surrey are considered as probably belonging to the lower zone of *Acanthoceras mammillatum*, though palæontological evidence of this is wanting. This evidence can now fortunately be supplied. About a mile and a half south-south-east of Merstham, at a point marked on the new 1-inch sheet 286 as "Stocklands Farm," there is a small brickfield where the extreme base of the Gault is dug. The junction with the Folkestone sands is not actually seen, but these sands are dug within a few yards of the section. In the lowest part of the clay there are abundant large and irregular phosphatic nodules, full of glauconite grains and with many quartz-grains also. In these nodules fossils occur, including two species of Ammonites, *Acanthoceras mammillatum* and *Desmoceras Beudanti*, the latter being particularly abundant. (These determinations have been kindly verified by Mr. Crick, of the Natural History Museum.) Other fossils occur, but not abundantly, and I cannot give a list, as most of them were dispersed among a party of my students before the special interest of the section was discovered. Coniferous wood occurs abundantly, beautifully preserved.

The section is closely similar in appearance to one at Reigate, described in Proc. Geol. Assoc., vol. xvi, p. 162, and there said to be unfossiliferous. On a recent visit, however, I found a piece of

coniferous wood there just like that at Stocklands, but no Ammonites. I would suggest to local geologists the advisability of a persistent search for the latter.

A. M. DAVIES.

25, Mortimer Street, W.

NAMES FOR BRITISH ICE - SHEETS.

SIR,—To discuss fully the wide questions raised by Mr. Lamplugh's reply to my letter of last April would require far too much space, so I content myself with repeating that to propose a name for that which has not been proved to exist is, to say the least, premature. It is also objectionable, because so many persons cannot become familiar with a name without assuming that it implies the existence of a reality. As man is naturally prone to idolatry, which in the present age commonly takes the form of phrase-worship, I am sure that if the North Sea Ice-sheet passed without protest it would quickly materialize into a geological fact. I had no objection to using the term 'Scandinavian Ice-sheet,' because something of the kind must have existed in that country, yet I was careful to speak only of 'Caledonian ice.' So I cannot allow Mr. Lamplugh to smuggle in an East British Ice-sheet under the cover of any phrase in my letter. As for the late Glacial age of the Dogger Bank, that of course is possible; but I think whoever makes use of it as an argument should indicate under what circumstances such a long shoal-like mass of morainic matter was deposited in that position. Also, I should like to have an explanation of the causes which would lead to an exceptional precipitation of snow on any particular part of a comparatively level plain which had considerable land masses on three sides. My complaint against the school of glacialists to which Mr. Lamplugh belongs is, that they insist on those facts which seem to favour their ideas and ignore all which have the contrary effect. Thus, like the defenders of the Ptolemaic system of Astronomy, they support hypothesis by hypothesis, and invent epicycles to escape from difficulties. It is, however, a gain to have it admitted that boulders did not take an inside or outside passage on an ice-sheet the whole way from Scandinavia to Eastern England. This encourages me to hope that a course of sea-bathing early in the Glacial Epoch may embolden some geologists to repeat the process later in the same, and to extend southward the submergence which must have occurred then (*GEOL. MAG.*, 1877, p. 72, and 1900, p. 289) in a more northern region.

T. G. BONNEY.

CURIOUS BRECCIAS IN THE HIGHLANDS.

SIR,—There are in the Scottish Highlands between Loch Katrine and the upper part of Loch Lomond several bosses of diorite surrounded by brecciated schist. These are very curious, for each boss of diorite is surrounded by a narrow fringe of breccia consisting entirely of schist without any admixture of igneous matter. It seems to me that the diorite must have been forced up in a solid state through the schist, which in consequence got broken up; for had the diorite been in a molten state when it came up, some of it would surely have flowed among the fragments of schist.