

## CORRESPONDENCE.

## SCOTTISH INTER-GLACIAL BEDS.

SIR,—Kindly allow me a few lines in reply to Mr. Clement Reid's statements in the last number of this MAGAZINE. Mr. Reid doubts the inter-Glacial age of certain deposits which have been described as occurring between Lower and Upper Boulder-clays at Cowden Glen, in Lanarkshire, and at Hailes Quarry and Redhall Quarry, near Edinburgh, brief reference to which is made at p. 99 of my "Great Ice Age," third edition. I shall take the cases seriatim.

1. *Cowden Glen*.—Mr. Reid has not visited this locality, and the section has been obliterated for some years. He objects to the fossiliferous beds being classed as inter-Glacial, for two reasons: (1) because in some material sent to him for examination he detected two seeds of the garden poppy, and (2) because the whole assemblage of plants and the state of preservation of the animal remains suggest to him an extremely recent date for the deposits. Now, had Mr. Reid perused a paper read by Mr. Bennie to the Geological Society of Glasgow in 1889, he would probably have expressed himself less decidedly. The material examined by Mr. Reid was washed from the peaty silt by Mr. Bennie in 1868 and 1869, and had lain aside for twenty years before it was submitted to Mr. Reid's inspection. Among this material, some obtained from another observer was included by Mr. Bennie. It is not unlikely, therefore, as Mr. Bennie admits, that the two poppy seeds might have found their way accidentally into the collection during the long time it lay in his possession. It is even not impossible that they might have been accidentally dropped into the packet by Mr. Reid himself. The latter is quite sure they are poppy-seeds, but, under the circumstances, it might have been as well had he got some botanist to confirm the determination. So much then for Mr. Reid's first objection. Now for his second. I am afraid that his inference from the fresh appearance of the organic remains does not go for much. Mr. Bennie, whose greater experience gives weight to his opinion, says that the remains are no fresher than might have been expected. Mr. Reid, having apparently made up his mind that Scottish inter-Glacial beds should not contain a temperate flora, seems to think that this preconceived notion of his should be accepted as an argument against the inter-Glacial age of the Cowden Glen beds, in which the relics of such a flora were certainly found. He must excuse me if I decline to accept his dictum as to what the organic contents of an inter-Glacial bed should be. Upon the whole, I think I am justified in putting more trust in the evidence of my own eyes, and in the corroborative testimony of my former colleagues on the Geological Survey and others, than in his not very remarkable discovery of two supposed poppy-seeds in a collection of washed materials which had been lying past for twenty years before it came into his hands.

2. *Hailes Quarry*.—Here Mr. Reid has succeeded in finding a

mare's nest. He says that he saw no Boulder-clay resting upon the Arctic-plant beds. I should have been surprised if he had. If, before venturing on his criticism, he had troubled to read my reference to these beds ("Great Ice Age," p. 303) he would have found that I described them, along with the Corstorphine Arctic-plant beds, as occupying hollows in the surface of the Upper Boulder-clay. They are clearly younger than any Boulder-clay in the Scottish Lowlands. The inter-Glacial beds, formerly so well exposed underneath the Upper Boulder-clay in the quarry at Hailes, and described by me in "Prehistoric Europe," p. 256, are no longer visible. If Mr. Reid had asked Mr. Bennie he would have escaped falling into error, and would have learned that the inter-Glacial peat described by me and the Arctic-plant beds discovered by Mr. Bennie occurred on two separate and distinct horizons. I may add that no material obtained from the Hailes inter-Glacial beds has ever passed into Mr. Reid's hands.

3. *Redhall Quarry*.—This section was described and figured by Mr. John Henderson twenty years ago (*Trans. Edin. Geol. Soc.*, vol. ii, p. 391). Mr. Henderson is a very careful and experienced observer, and knows the geology of the district well, and I have been content to rely upon his evidence. But I may mention that many other members of the Edinburgh Geological Society visited the quarry when it was first opened, and no one ever doubted that the glacial deposits occupied their original position. I did not myself see the section until long afterwards, by which time it had become more or less obscured, but nothing observed by me tended to throw any doubt upon the accuracy of Mr. Henderson's description. The situation of the quarry was familiar to me before the ground had been broken into for quarrying purposes. It was a slight depression lying between gentle slopes, from which no slips or slides of Boulder-clay could possibly have taken place. Mr. Henderson confirms my recollection of the facts, and informs me that at the time the quarry was opened undisturbed Boulder-clay extended continuously over the whole area. It was only when this Boulder-clay had been dug through that the inter-Glacial peat was disclosed. If it were the case that the plants recorded by Mr. Reid as having come from this place and Cowden Glen could not possibly have lived in Scotland during inter-Glacial times, I should be compelled to come to one of two conclusions—either (a) that Mr. Reid's unconfirmed botanical determinations are not necessarily infallible, or (b) that he has inadvertently mixed his samples or confused his localities, or both.

I have not noticed all Mr. Reid's statements and expressions of opinion which lay themselves open to animadversion, but have probably said enough to show that his attempt to discredit observations made by myself and others has not been quite successful.

EDINBURGH, 3rd May, 1895.

JAMES GEIKIE.