formerly occupied by the Stainmoor glacier. The dark-blue clay is mainly derived from Carboniferous rocks. A detailed description of the Glacial deposits, boulders, and striæ is next given; and from this the following conclusions are deduced:—Upper Teesdale was heavily glaciated by local ice from the eastern slope of the Cross Fell Range; this part of the Dale was not invaded by any other ice, and the higher peaks stood out as nunataks. At the period of maximum glaciation a number of lakes were formed, owing to the obstruction of the drainage of lateral tributary valleys by the ice of the main glaciers. Lunedale was occupied by ice (the Stainmoor glacier) which came from the drainage-basin of the Irish Sea, joined the Teesdale glacier about Middleton-in-Teesdale, and by its thrust deflected the Teesdale ice into the Valley of the Wear. During the retreat of the ice there was a lengthened period of 'constant-level,' when well-marked drainage-channels were formed, and after this the ice was removed with great rapidity. A tongue of ice flowed from Upper Teesdale by Yad Moss to the Valley of the South Tyne.

Similar evidence with regard to Weardale and the Tyne Valley is given, and the following conclusions are drawn among others:—Ice from Teesdale and the tributaries of the South Tyne occupied the valley of the latter nearly as far as Lambley, where it was joined by a large glacier which crossed the northern end of the Pennine Chain. This glacier was continuous in a northerly direction with the ice of the Southern Uplands and the glacier of the North Tyne, and, when at its maximum, deflected the last north-eastward, causing a movement in that direction along the southern flanks of the Cheviot Range. But at the beginning and end of the glaciation the ice in the Valley of the North Tyne flowed south-eastward. The southern margin of the South Tyne glacier passed across the heads of Allendale and Devil's Water into the Wear Valley; and along this margin were a series of ice-dammed lakes with a corresponding series of overflow-channels, many of which are now streamless. Weardale was mainly occupied by its own ice, but the lower part of the valley was invaded by the Tyne ice from the north and that of the Tees from the south. There were no lakes strictly connected with the last system.

CORRESPONDENCE.

DEAN BUCKLAND AND McENERY.

Sir,—May I call attention to a point in the history of geological science which seems in danger of falling into the realm of myth, and which apparently can yet have light thrown on it by at least two geologists, whose names are well known and honoured by all who desire that that history should be handed down to future generations in its integrity. I refer to Professor Rupert Jones and Mr. A. R. Hunt.

The first discoveries which led to the views now held as to the antiquity of man were made in Kent's Cavern in 1825–6 by the

Rev. John McEnery. Yet English science has lost the credit of priority by the fact that the records of these discoveries remained unpublished until 1859. It has been suggested that their publication was "suppressed," owing, according to one writer, to the influence of Huxley, of all men in the world. The erroneousness of this amazing statement was at once pointed out by the two geologists I have named. Mr. Hunt, however, associates the delay in the publication of the Kent's Cavern evidence with the delay in issuing that of the Brixham Cave. The two cases seem entirely distinct. McEnery's discoveries were made thirty years before the Brixham Cave was explored, and during that time many facts discovered on the Continent had come to light. Professor Rupert Jones, on the other hand, tells us that the notes, supposed to be "lost," were "really kept in the background by influence of the Rev. Dean Buckland." The Professor must be in possession of facts which are certainly not to be found in the evidence as it stands.

I have carefully studied the literature of the subject, and can find no suggestion of influence brought to bear by anyone with a view to suppression of publication of the notes. McEnery *may* have been deterred by fear of orthodox persecution, or out of deference to Dean Buckland, who differed from him in some of his conclusions, but there is no evidence for either theory. If I might suggest a reason for the non-appearance of the work during his lifetime, I should say it is to be found in the modesty, simplicity, and amiability of McEnery's character. His own story is perfectly explicit. His original intention was to publish the results of his researches at once. His private means being insufficient for this, he drew up a prospectus with the object of procuring pecuniary assistance, but apparently this prospectus was never issued. Partly on account of bad health, and partly in the belief that some one better equipped than himself in geology and palæontology would take the matter up, he abandoned the idea of publication, but continued adding to and altering his notes to such an extent that they became terribly confused. We find additions made to them as late as 1836, containing quotations from Buckland's Bridgewater Treatise, published in that year. Finally, shortly before his death, he again announced his intention of publishing his memoir forthwith. Unfortunately, he died in the beginning of 1841, without having even prepared his notes for the printer.

The subsequent history of his manuscript seems equally clear. His effects were sold by auction, and the precious notes happened to be mixed up in a miscellaneous 'lot' of sermons and other papers, which was purchased by Mr. Lear, a Torquay tradesman who collected fossils. From him, or perhaps after his death, they were purchased by Mr. W. Long, F.G.S., of Saxmundham. This gentleman had already shown much interest in cavern researches, and had communicated a paper on the subject to the British Association Meeting at Newcastle in 1838. He handed them over to Mr. Vivian with a view to their publication, which was effected in 1859. It is worthy of remark that for seven or eight years

before that date, any influence on the part of Dean Buckland was out of the question. Professor Rupert Jones has, rightly, I think, referred to the statement regarding Huxley as "not only uncalled for, but unkind." Will he now, for the sake of historical accuracy, give us his reasons for placing the burden of responsibility on the shoulders of the Dean? And will Mr. Hunt let us have the "long story" so far as it refers to McEnery's notes? If, as he says, it dates "long subsequent to McEnery's death," again it is difficult to see where and how Dean Buckland's influence was exerted.

J. Adam Watson.

"Hay Tor," Dennington Park Road, Hampstead.
December 21st, 1901.

THE HOLOCENE DEPOSIT AT CASTLE CARY.

Sir,—In our recent paper on "The Post-Pliocene Non-Marine Mollusca of the South of England" (Proc. Geol. Assoc., vol. xvii, pt. 5), when speaking of the holocene deposit at Castle Cary (p. 234) we express regret that we were unable to obtain any information concerning it.

Our attention has now been called to the fact that an account of this alluvial deposit is given in the Geological Survey Memoir on East Somerset by Mr. H. B. Woodward, and we hasten to express our regrets to that author for the oversight. He gives the following list of shells which he obtained from the spot in 1868, viz.: "*Helix aspersa, H. nemoralis, Cyclas, Ancylus fluviatilis, Limneus, Unio* (fragments)." Of these, only one, the *Ancylus fluviatilis*, is common to our list; concerning the others, not having seen the specimens, we are unable to pronounce any opinion.

A. S. Kennard.
B. B. Woodward.

OBITUARY.

PROFESSOR RALPH TATE, F.L.S., F.G.S.

Born 1840. Died September 20, 1901.

If Professor Tate had remained in England his loss would have been severely felt by British geologists; as it is, that loss is to a large extent transferred to the Antipodes, where South Australia will increasingly lament the departure of one who has been so much to the science of the Colony. In this country his memory will linger chiefly in the minds of those who can look back beyond the last quarter of a century, but it will be a fond memory, based on sincere admiration of his powers and his character.

Ralph Tate was the nephew of the well-known geologist George Tate of Alnwick, where he was born in 1840. He received his primary education at the Cheltenham Training College, whence he was sent in 1857 to the Royal School of Mines, where he studied for two years. After some little practice in teaching at the Polytechnic he went to Belfast in 1861 as teacher of Natural Science