



Fig. 3.—Diagram of restored Pteraspis.

of the shield. Professor Huxley informs me that he believes them to be the sites (if I may so say) of mucous follicles. I have thought this worth mentioning in a note, as they have never before been noticed.

When and how was the Isle of Wight severed from the Mainland?

SIR,—On two different occasions inquiries have been made in the pages of the 'Geologist,' as to the period at which the Isle of Wight was torn from the mainland and entrusted to the rude guardianship of the ocean. The subject is an interesting one, especially in its geological aspects; and as I have given some attention to it, I will attempt to reply to the inquiries of your Lymington correspondent.

I am not aware that there is the least particle of historical evidence that gives countenance to the famous passage in Diodorus Siculus that has been interpreted by various writers as proving that, when he lived, the channel of the Solent was fordable at low water. As the particular island of which Diodorus is speaking, was one from which the miners of Cornwall were in the habit of exporting their minerals, and there is a small isle (St.

Michael's) on their own coast, to which such minerals could easily have been conveyed, and which, in its connection with the mainland, answers pretty closely to the historian's remarks; and further, as I know of no argument worth listening to why the miners of Cornwall should have transported their tin to the Isle of Wight for exportation,—on all these several grounds, I think one may safely conclude that neither Diodorus, nor any other writer of note, has left any evidence whatsoever about the fordableness of the Solent within historical times.

The severance of this island from the mainland, it appears to me, was effected under very unusual circumstances, and at a very distant period. The present channel of the Solent, being pretty nearly equally deep and equally broad throughout its entire length of twelve or fourteen miles, proves at once that it was not formed in the usual way of island-severing channels, that is, by gradual encroachments of the sea on the two opposite sides of a narrow neck of land. If so formed, the middle part of the channel would naturally have been both narrower and shallower than the two mouths that first admitted the tide towards it; but this is not the case. Nor are there any important indestructible obstructing rocks on either side of the channel that could account for this peculiar formation. It is to be accounted for, therefore, not by the excavations of a gradually approaching sea, but, as I shall hereafter have to attempt to show, by its being originally the trunk or outlet of a very considerable river.

Again, at the western mouth of the Solent, there is almost an immeasurable accumulation of rolled flints, with which are mingled a sufficient sprinkling of fragmental fossil shells of various genera and species to show us from whence the whole mass was originally transported. This accumulation forms a sort of natural breakwater, two miles in length, one hundred yards in breadth, and many feet in thickness, extending between the mainland at Milford and a point beyond midchannel, where Hurst Castle was erected three centuries ago. Where the castle stands, this bank of flints becomes expanded so as to cover a circular space of fully twenty acres. Now all this enormous accumulation of flints, together with another one probably much larger on the island side of the main channel, and lying under the sea, in front of Alum Bay and the Needles, are formed of drift and broken fossils from the Barton beds; the fossils themselves plainly pointing to the formation whence the whole mass was derived. It would add too much to the length of my paper, to account for this vast lodgment of drift around the mouth of the Solent; neither is this needful as respects the objects of my remarks: only I would have my readers to understand that it depends upon the flow of tide through the channel of the Solent. And when it is remembered that the annual supply of drift along the Barton cliffs is comparatively small, it will then be seen that it must have required a period reaching far back in time to gather together the vast accumulations referred to above, and consequently they may be regarded in themselves as visible and lasting memorials of the very great antiquity of the separation of the Isle of Wight from the mainland.

Nay, I will venture to hazard an opinion, even though I stand without geological authorities to support me, that will place the date of the formation of the Solent Sea still further back in the dimness of the past; an opinion to which both the peculiarities of the channel itself above referred to, and the geological formation of the surrounding country, bear very strong testimony. Whoever as a geologist examines the vertical strata of the chalk at the Needles, nay, and throughout the whole length of the Isle of Wight, and the strata of the same rock in exactly the same unusual position on the bold white cliff on the Dorsetshire coast some twenty miles

westward of the Needles, will not doubt but that the two promontories were once united, forming a rocky neck of land from Dorset to the Needles. This chain of chalk might, or might not, be so cleft in twain as to allow the rivers of Dorset and Wilts. to find a passage through them to the main ocean. My opinion, however, is that they had no such outlet, but that, at that far distant period, the entire drainage of more than two counties, embracing the rivers that join the sea at Poole and Christchurch, flowed through what is now called Christchurch Bay, down the Solent, and joined the sea at Spithead.

According to this theory, the Solent was at that time an estuary somewhat like the Southampton Water, having but one opening to the British Channel; but of so much more importance than the latter as it was fed by a vastly greater flow of fresh water; and it further supposes that the bed of the Solent was scooped out originally by a river, which from the extent of its drainage one may guess to have been little inferior to the Thames or the Humber. And this opinion acquires countenance from the circumstance that it accounts, in a most satisfactory way, for the equality of depth and breadth in the Solent Sea. Of course, according to this view, this sea would lose its original condition as an estuary at the time when the British Channel had so far made a breach through the chain of rocks connecting the Isle of Wight with Dorsetshire as to give an opening into itself for the Dorsetshire rivers, somewhere opposite to the town of Christchurch. From that time forth the Solent would become what it is at present, losing its character as an estuary, and assuming that of a long narrow sea. And at the same period, of course, the Isle of Wight would part with its peninsular character, and be severed from the mainland, but at a point far apart from that at which the severance is usually supposed to have taken place. The distant period at which such changes took place it would be hopeless to guess at, amid the dimness of the data on which calculations could be founded. It could not be less, however, than many thousands of years, seeing that since that time, the British Channel has not only made a broad breach of twenty miles through a chain of slowly yielding rocks, but has also pushed its way gradually across the broad extent of the Poole and Christchurch Bays.

In conclusion, I would observe, that if your correspondent at Lymington simply put his question about the separation of the Isle of Wight as an archaeological inquiry, I fear he will consider my answer to it as somewhat dreamy. But I am confident, if he and others who may honour me with a careful perusal of my observations, are tolerably acquainted with the geology of the neighbourhood, and have had their minds disciplined for realizing the operations of nature on a large scale and through lengthened periods of time, they will perceive in this paper opinions indicative of more than novelty, having, as I believe, very important geological facts to uphold them.

Yours, etc.,

W. Fox.

Brixton, Isle of Wight, Nov. 8.

Tracks, Trails, and Imprints.

DEAR SIR,—At nearly the same time, probably, when I was pointing out the desirability of careful drawings and casts being made of the tracks and trails of living annelids, mollusks, insects, etc. ('Geologist,' No. 52, p. 138, April, 1862), for the guidance of the palæontologist in decipher-