

THE SEA AGAINST THE PLOUGH.—REPLY TO MR. G. POULETT SCROPE.

To the Editor of the GEOLOGICAL MAGAZINE.

SIR,—I can scarcely suppose that the banks and lynchets¹ with which Mr. G. Poulett Scrope is most familiar are of the same nature as those which I believe to be old *sea-coast lines*, and which every Lyellian geologist should expect to find in situations favourable to their formation and preservation. The terraces in the Cretaceous and Oolitic districts of the south of England, to which I have all along alluded, are generally speaking from 15 to 40 feet in height, and from 15 to 60 feet in breadth; but many of them are much smaller, and not a few very much larger, embracing even the whole of an escarpment. The smaller, however, are often so associated with the larger as to leave little doubt of a common origin.² They may be seen in great variety between Mere and Hindon, between Blandford and Sturminster, in the neighbourhood of Bridport, etc. They present the same aspect as many lower level terraces in Somersetshire, commencing on the Coast, and running inland beyond Glastonbury, and in Dorsetshire near Bridport harbour, etc. They are likewise similar to many systems of terraces in the neighbourhood of the Moray Frith, and the Great Glen, in Scotland. That the inland terraces of Dorset and Wilts are not covered with “shingle or rolled pebbles” is no presumption against their marine origin, for it is now well known that on shores fringing steep slopes, where there is little facility for the drifting of materials, the sea often fails to round fragments of rock, and that chalk flints under *ordinary* conditions require to be subjected to a second or even third stage or period of attrition before they can become rounded. [Lyell’s Elements, p. 370].

It is true that a section of several lynchets near Warminster, kindly furnished by Mr. Codrington, F.G.S., exhibits an apparent addition of made ground to their general profile, in a way however that the plough will not explain; but it is only reasonable to suppose, as I have before remarked, that man may have tampered with and rendered less sloping the platforms of these and other terraces, or even imitated nature in making entire terraces. Still there are peculiarities connected with the fundamental form, structure, and arrangement of those I have observed which the sea only will account for, such as the extent to which their profile corresponds with the indentation in the rock beneath; their frequent waved or inclined

¹ See Mr. Scrope’s Article “The Terraces of the Chalk Downs,” in the July Number of the GEOLOGICAL MAGAZINE, p. 293.

² The extent to which these terraces have preserved their sharpness of outline, supposing them to have been formed during a pre-glacial submergence, furnishes no real objection to the theory of their marine origin, as grass-covered lands away from the courses of temporary or permanent streams are capable of preserving their surface-configuration for an indefinite period. Mr. G. Poulett Scrope himself, in the article I am now answering, attributes to grass a power of checking the descent of silt, greater than would be required for ordinary surface-protection.

deviations from longitudinal horizontality,¹ where it may have been caused by locally-unequal elevation or depression, and where it could have served no economical purpose; the varying breadth of many of the terraces, and the occasional merging of a lower into a higher cliff, as might be expected, supposing them to be successively worn-back coast-lines; the way in which they narrow off or vanish, and re-appear; the positions they occupy, which are often the least eligible for cultivation, if not beyond its reach; the historical or archaeological evidences of their extreme antiquity which, I believe, can be adduced; and, above all, their great number and extent.

So far as my observations have extended, the plough would appear to obliterate rather than form regular systems of terraces such as those above described. Mr. G. Poulett Scrope believes that the agricultural theory of their origin is the one generally received. But it is well known in the south of England that antiquarians have claimed these terraces, and that those of them which encircle hills have been regarded as the remains of Phœnician hill-cities. If they originated, as Mr. Scrope supposes, in the cultivation of longitudinal strips of land by separate owners or tenants, the upper cultivator "careful not to allow the soil of his strip to descend to fertilize his neighbour's below," the arrangement must have been worthy of a very short-sighted race of farmers; for most of the terraces are so *narrow* that the part really available for cultivation could not have been more than two or three yards in breadth, or so *wide* and *high* that the amount of labour necessary to farm them must have been too great for a profitable return; and one can scarcely help supposing that the cultivators might have invented a more economical and less troublesome boundary than the accumulation of a bank of soil, impoverishing the inner part of a "strip," and requiring the constant watch of its jealous owner. There are other points in the agricultural theory which not only suppose a cause disproportionate to the effect, but involve a series of improbabilities one would not expect to find in an explanation set forth as the opposite of a "preposterous idea."

I regret that I have to write from memory, and that I may not have an opportunity of corroborating the above statements by revisiting the localities for several months to come. Meanwhile several competent gentlemen are kindly making observations, the results of which will soon be published.

In conclusion I would venture to call the attention of geologists to the necessity for subjecting the theory of the non-submergence of the South of England during any part of the glacial period, to the test of facts, by following up the observations lately made by Mr. Maw, in Devonshire.

D. MACKINTOSH.

¹ I should not go so far as to assert that each of the smaller terraces (which are frequently not parallel) indicated a pause in the rise or fall of the land, as we know that the sea often leaves terraces, regular and irregular, between the extreme highest and lowest tide-levels.