the discussion much stress is laid, and rightly laid, on the occurrence of rich Permian marine faunas in Texas and Timor, among others. Let us consider for a moment what the announcement of a discovery of " the richest marine Permian fauna in the world " really means. Such an announcement, when analysed, really amounts to this: a recently discovered fauna with many new species contains also forms which somebody has called Permian in some other locality: it is just arguing in a circle, and as the definition of a Permian fauna started off with queer abnormal assemblages in North-West Europe, it can only be called a vicious circle.

A good account of the Permian fauna of Timor and neighbouring islands will be found in Brouwer's *Geology of the Netherlands East Indies*. In this connection it may be mentioned that in the northern part of the Malay Peninsula there is every reason to believe that the great marine limestone of the Raub series (a typical development of the Carboniferous Limestone facies) passes up with little or no break into the Trias, which is also marine of a sort, and in which Rhaetic fossils have been described on good authority. There appears to be no need at all for a Permian system here, and it is not very far from Timor. The contrast between this area and Gondwanaland is violent, and yet it lies directly between India and Australia. Its affinity, if any can be traced, is with the Himalayan region.

In view of the peculiar characters of the Carboniferous, Permian, and Trias in Northern Europe, where these systems were first defined, and in North America, the question may legitimately be stated in this way, so far as regards the marine strata: the Goniatite faunas of the Carboniferous, so far as they go, are quite definite; the Ammonite faunas of the Southern Trias (Tethys) so far as they go, are quite definite: somewhere between them is a transition, if there is anything in evolution. Where is this transition, and if it exists, are any part of the strata containing it sufficiently well-defined to constitute a system apart from the Carboniferous and Trias? This, it seems to the writer, is the problem of the Permian.

CORRESPONDENCE.

AN UNKNOWN KELLAWAYS LOCALITY IN DORSET?

SIR,—Some palaeontological evidence bearing on off-shore tectonics and the underground structure of the Chesil Beach was observed recently when examining with Mr. L. Richardson the banks of the West Fleet Backwater. One mile west-south-west of Langton Herring Church where the Fullers Earth oyster-bed crops out in the northern limb of the Weymouth anticline and the shore is formed of Fullers Earth Clay, large numbers of Callovian fossils were found washed up along a stretch of about 100 yards.

The commonest species are *Trigonia irregularis* Seebach, *T. elongata* Sow., *Liostrea undosa* (Phil.) and *Lopha marshii* (Sow.), with numerous fragments of flattened *Proplanulites*, some having *Serpulae* attached.

Many of the *Trigoniae* are broken, but large numbers, although very fragile, are whole and unworn, and may be collected in an exceptionally perfect state of preservation. The nearest point at which Callovian or higher beds touch the shore is distant 2 miles in one direction and 2½ miles in the other. It is inconceivable that any of the fossils can have travelled 2 miles along the coast without becoming broken or worn. Moreover, on their journey they would have to pass localities where the shore is covered with Cornbrash fossils, and others where it is almost made of Bradfordian brachiopods from the *Rhynchonella boueti* Bed, yet they have collected none of these on their way, nor have they left any trail along the intervening beaches. Long-shore drift in the Fleet is, in fact, so slight that the outcropping fossil-beds contaminate only small areas.

The inference seems justifiable, even unavoidable, that opposite this point on the coast there is a submerged tract of Kellaways Beds faulted down against the middle of the Fullers Earth. As few of the pebbles from the Chesil Beach cross the Fleet to the opposite shore, it is likely that the shells are being weathered out of the bed of the backwater.

Incidentally, the locality provides a striking illustration of how mistakes may have crept into old records. These shells have obviously come from a clay matrix and they lie upon a clay foreshore, in which other oysters may be seen *in situ*. What more natural than to regard them all as belonging to the Fullers Earth ?

W. J. Arkell.

14 Chadlington Road,
Oxford.

THE CLAY PEBBLE BED OF ANCON, ECUADOR.

Sir,—Dr. Busk's letter in your May issue having reopened the discussion concerning the origin of the Clay Pebble Bed of Ancon, Ecuador, I should like to state that after ten years' study of the tectonics of north-west Peru I have proved beyond doubt that the Tertiary Rocks from Payta in Peru to the Santa Elena Peninsula in Ecuador have slipped down the steep slope on which they were deposited. This conclusion is based on several hundred square miles of large scale geological mapping and the examination of 800 well logs representing 1,700,000 feet of drilling.

The result is, as Dr. Busk states, a gigantic tectonic breccia, at least 200 miles long and 20 miles wide. Clay Pebble Beds are common throughout, though that at Ancon is the best example.

The movement has taken place along huge *slip planes*, which are in every way similar to thrust planes except that they are normal faults of low angle instead of reversed faults, so that instead of