

limit of glaciation in the countries, and this would show that some equalizing effect *was* produced by the diminished and partial diverted Gulf-stream, as Dr. Croll's theory requires.

Having recently been subjecting the whole of the evidence on the subject of "geological climates" to a careful examination, I may state, that I have arrived at an important modification of Dr. Croll's theory, which will, I believe, obviate the chief objections that have hitherto been made to it. The subject will be fully discussed in a volume I am now engaged in printing.

CROYDON, April 18th, 1880.

ALFRED R. WALLACE.

PERMIAN ROCKS.

SIR,—The investigation at present occupying the attention of Messrs. Teall and Wilson is, I believe, one connected with a most important geological question,—a question that hereafter must engage more attention than it does at present. These inquirers however are in advance of their age, and have much up-hill work before them. Nevertheless I suspect that hereafter geologists will have to allow that the rocks of the so-called "Permian Formation," are only "passage-beds" between Carboniferous and Triassic formations,—palæontologically allied to the first, but stratigraphically to the second. Before this is accomplished, a great deal of work will have to be done in collecting and arranging in tabular form all the evidence in connexion with the rocks of this so-called formation; and thus prove the *hiatus* said to exist in different places to be imaginary.

In Ireland there are only small exposures of Permian rocks, yet they appear to be very important, as they point to the true character of the rocks that have been elevated into a "formation." They are as follows:—

Permians of Armagh.—These rocks are in the vicinity of Armagh town, and apparently are the conglomeratic basal beds of the Trias. There is no evidence to prove an unconformability between them and the Trias.

Permians of Benburb.—These are exposed in the Blawater valley on the nearing of the counties Tyrone and Armagh. They undoubtedly belong to the Carboniferous, as they lie conformably on a true Carboniferous limestone, while in the centre of the group is a bed carrying typical Carboniferous fossils.

Permians of the Lagan Valley.—Those near Moira are of a somewhat similar type to those of Armagh, and here, as there, seem to be at the base of the Trias; while those at Cultra would have been classed with the associated Triassic beds but that they carry fossils similar to those of the Durham Permians.

Tullyconnell Permians.—These rocks, although apparently belonging to the Trias, carry fossils similar to those in the Cultra beds. In one locality (Templereagh) they are very instructive; here, while sinking a coal-pit, a dolomite 16 feet thick was found, stratigraphically belonging to the Trias, but palæontologically to the Permian. The Permians of Tullyconnell and Cultra, although

palaeontologically similar, seem to be on different geological horizons ; as the first are associated with Keuper Marls, and the latter with Bunter Sandstones.

G. HENRY KINAHAN.

UPPER DEVONIAN IN DEVONSHIRE.

SIR,—In connexion with Prof. Roemer's paper in the April GEOLOGICAL MAGAZINE, it may be of interest to remind geologists of the occurrence of the *Clymenia* limestone at Lower Dunscombe, above the *Goniatites intumescens* stage. The highest bed the Professor appears to have observed at Lower Dunscombe was the flaggy limestone with *Goniatites*. Want of time prevented my collecting from this part, and the short list in my paper is from the thicker-bedded limestone a few feet lower. In the field above, however, which, at the time I examined it, was newly ploughed, there was a quantity of shaly or nodular limestone, full of *Clymenia* (*C. valida* and *C. striata*).¹

This discovery of the *Clymenia* stage in South Devon is due to Mr. Etheridge, who determined the fossils. CLEMENT REID.

DESCRIPTIONS OF THE FOSSILS FROM SUMATRA. ADDENDA ET CORRIGENDA.

[See GEOL. MAG. 1879, Decade II. Vol. VI. pages 385, 441, 492, and 535.]

- I. The fossils, Nos. 1-4, pp. 386, 387, are from the Carboniferous Limestone of Sibelaboe, Highlands of Padang.
- II. *Sparganolithes gemmatus*, Pl. X. Fig. 4, is from the shale above the second coal-seam of Soengei-Doerian,² Highlands of Padang ; Eocene, 2nd stage.
- III.—The following twelve fossils are from the Limestone with Orbitoides and Corals at Batoe Mendjoeloe, Highlands of Padang ; Eocene, 4th stage, equivalent to stage γ of Borneo :—

<i>Cardita</i> , sp.	Pl. X. Fig. 6.	<i>Cypræa subelongata</i> .	Pl. XII. Fig. 3.
<i>Lucina</i> , sp.	" " 7.	<i>Cerithium</i> , sp.	" " 4.
<i>Pecten</i> , sp.	" " 12.	<i>Turbo Borneensis</i> ?	" " 5.
<i>Cidaris</i> , sp.	" " 17.	<i>Phasianella Oweni</i>	" " 6.
<i>Conus</i> , sp.	Pl. XII. Fig. 1.	<i>Trochus</i> , sp.	" " 7.
<i>Conus substriatellus</i> .	" " 2.	<i>Prenaster</i> , sp.	" " 8.

- IV. All the other sixty-five fossils are from the marls of the Island of Nias, probably of Miocene (late Miocene) age.
- V. The *Cardita Sumatrensis*, Pl. X. Fig. 5, is also from the Nias marls or clays, and not from the clay-bed associated with the coal of the 2nd stage, Eocene.

R. D. M. VERBEEK.

PROFESSOR MILNE ON VOLCANOS.

SIR,—When Professor Milne was writing his article on the distribution of Volcanos I happened to say to him pretty much what is contained in Mr. Fisher's letter in your last number. His answer was—"I wish to keep myself from committing the common error of many geologists who know a little mathematics, the error of imagining that I can create a mathematical theory for a phenomenon, when I am only acquainted with part of the cause of the phenomenon. On the supposition that rock is always of the same conductivity, we may find that an isothermal surface is probably one thousand feet

¹ GEOL. MAG. Dec. II. Vol. IV. p. 454.

² See GEOL. MAG. Dec. II. Vol. II. p. 480.