

and other authors, were shown to agree with these later Tertiary andesites, both in their mineralogical constitution and in the peculiar phases which they present to us. The latest Tertiary ejections were shown in 1874 to bear the same relations to the five grand volcanoes of the Western Isles which the chains of "pays" in Auvergne do to the great central volcanoes of that district; and this conclusion is strikingly confirmed by petrographical studies of which the results were given in the present memoir.

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## CORRESPONDENCE.

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### AGE OF THE VOLCANIC SERIES IN SHROPSHIRE.

SIR,—In reference to the debate on a paper "On the Pebidian Yoredale Series of St. Davids," read by Prof. C. Lloyd Morgan before the Geological Society on the 8th inst., Prof. Blake is reported to have said that recent work in Shropshire "had shown that there was a volcanic series more satisfactorily classed with the Cambrian than with the underlying series." Though I have some familiarity with the older rocks of Shropshire, I am unable to call to memory any volcanic series that can by any reasonable stretch of imagination be referred to the Cambrian. If Prof. Blake refers to the Uriconian system, surely the most recent work tends to throw it further back from the Cambrian. But perhaps he will favour your readers with a few words of explanation.

CH. CALLAWAY.

SANDORE, WELLINGTON,  
Jan. 16th, 1890.

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### GROUND MORAINES.

SIR,—I have just read in Professor James Geikie's Address to Section C, British Association, "Swiss geologists are agreed that the ground-moraines which clothe the bottoms of the great Alpine valleys, and extend outwards sometimes for many miles upon the low ground beyond, are of true glacial origin. Now these ground-moraines are closely similar to the Boulder-clays of this country [Britain] and Northern Europe."

We have in New Zealand, also, extensive deposits of ancient glaciers; but I have never seen in New Zealand anything corresponding to the Boulder-clays and stratified tills of Britain; and if this is correct, it would follow that Boulder-clays cannot be the ground-moraines of glaciers.

The subject is an important one, and I would suggest that the British Association should send some one to New Zealand who is an expert in Boulder-clays, to settle the question. Two months in Otago, Canterbury, and Westland, between November and April, and three months for the two voyages, would be sufficient time, and the cost would not be more than £200 or £250.

I do not know any more promising geological work at the present day than a comparison of the glacial deposits of New Zealand with

those of the northern hemisphere; but to be effectual, the comparison must be made by one who is well acquainted with the northern deposits.

F. W. HUTTON.

CHRISTCHURCH, N. Z., 12th Nov. 1889.

CORAL-LIKE STRUCTURES FROM THE CULDAFF LIMESTONE, CO. DONEGAL.

SIR,—I feel sure it will interest many of your readers to learn that the peculiar Coral-like structures from the Culdaff Limestone have recently been identified by Prof. James Hall, of Albany, and Mr. Charles Walcott, of the U. S. Geological Survey, as belonging to two genera of Palæozoic Corals, namely, *Columnaria* and *Tetradium*; forms which are often found together in the Hudson Group of America. These determinations have been arrived at, first, from photographs of specimens from the Survey Collection, but afterwards from five specimens selected and forwarded for examination. The determinations were independently made, and serve to confirm each other; and Prof. Hall gives a detailed diagnosis of each specimen.

I may add that similar determinations have been arrived at by Professors Dana and Ferd. Roemer from an inspection of photographs only. Descriptions of some of these forms will appear in the Geological Survey Memoir on Inishowen, North Donegal, now passing through the press. The identification of these forms by such experienced palæontologists as those above named must be regarded as of the highest importance in throwing light on the question of the age of the Donegal crystalline rocks; a question to which I hope to return at a future time.

EDWARD HULL.

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NOTE ON *PHLYCTÆNIUS*, A NEW GENUS OF COCCOSTEIDÆ.

SIR,—As my friend Dr. Hinde has just called my attention to the fact that the name *Phlyctænius* has already, under the form *Phlyctænum*, been given by Prof. Zittel to a genus of fossil Sponges, I propose to substitute for it the term *Phlyctænaspis*, concerning which I can find no evidence of preoccupation.

R. H. TRAQUAIR.

RADIOLARIAN CHERT IN THE BALLANTRAE SERIES (=LLAN-DEILO-CARADOC) OF THE SOUTH OF SCOTLAND.

SIR,—Sections of this rock, just received from Mr. B. N. Peach, of the Geological Survey of Scotland, unmistakably show that it is mainly composed of Radiolarians. These bodies were first recognized in the chert by my friend Prof. H. A. Nicholson, but their real nature is only now conclusively shown in the sections sent me.

21 February, 1890.

G. J. HINDE.