

As the object of the paper was to arrange facts rather than to propound theories, the conclusion was chiefly occupied in summing up and correlating. It was shown that, since the leading feature of the rock masses between the Oxford and Kimmeridge Clays is *variety*, a strict and rigid correlation is altogether impossible. Yet, in spite of great local differences, producing in many places a strongly contrasted facies, there are certain features which may be deemed fairly characteristic of the several divisions. The bank-like character of most of these beds was insisted upon. A table of comparative sections, 14 in number, affording a generalized idea of the development, was exhibited, and the stratigraphical verifications of many of these given, as sections drawn to scale, in the body of the paper.

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CORRESPONDENCE.

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ORIGIN OF LAKE-BASINS.

SIR,—In reading the correspondence and remarks on the origin of Lake-basins in the November Number of the GEOLOGICAL MAGAZINE, it has occurred to me that the glacial origin of these basins may be explained without supposing the ice to have scooped them out of *solid* rocks such as we now see around them. I have been led to this idea by a study of the phenomena connected with the decomposition of rock *in situ* in southern latitudes—Australia and Brazil. Similar facts may likewise be seen in South Carolina, Georgia, etc.

In these regions, which have never been glaciated, the surfaces over more or less extensive areas consist of quite soft decomposed rock, and mining operations have shown that this decomposition has been very irregular in its action, and that often great masses, resembling boulders, are quite unchanged, though completely surrounded by the decomposed material; and the varying depth to which the decomposition has extended has resulted in producing a *solid rock* surface as full of hollows and depressions of all shapes and sizes as can be found in any of our northern lake regions. And if we admit that prior to the Glacial period these northern lake regions were similarly covered with decomposed rock, then the ice would not be called upon to exert any very extraordinary power in order to scoop out any number of lake-basins, and to leave enormous boulders scattered over the face of the country as we now find them.

GEOLOGICAL SURVEY OF CANADA,  
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ALFRED R. C. SELWYN.

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MR. DURHAM ON KAMES, AND MR. MELLARD READE ON  
BOULDER-CLAY.

SIR,—If Mr. Durham's Kames be the equivalent of the English and Irish Eskers, I cannot help thinking that he has not had an opportunity of seeing a series of good typical sections of these deposits. Along the east borders of North Wales (where I have examined the Eskers) clear sections demonstrate that their surface-configuration has been scarcely at all altered by atmospheric action, and that the internal structure of the swamp-

and-lake barriers is a continuation of that of the mounds, and not superinduced. In the above district most of the eskers occur at a distance from river-valleys; often where there are no streams of water; and sometimes on the summits of hills. Their magnitude (reaching 150 feet in height) in Shropshire; the breadth of the barriers, and the depth and size of the inclosed lakes (not to mention the frequent total absence of streams of water) clearly show that their forms were left by the agency that piled them up, or denuded them before their emergence from the sea. So far as I am aware, all English and Irish geologists believe that their curvilinear shape is not owing to atmospheric action. [See Mem. of Irish Geol. Survey, 98, 99, 108, 109, 117, 118.]

In answer to Mr. Mellard Reade I have only to say that I do not regard the drifts in the neighbourhood of Liverpool as good representations of the *general* succession one may trace from Carlisle to Church Stretton in Shropshire. Long sea-coast and railway sections between these places (over a distance of about 150 miles) show a persistency in the relative positions of the three drifts, or of two of them where only two are present. The clay left by the sea washing the sand and stones out of the Boulder-clay *would not form a Boulder-clay somewhere else on the same horizon*, but would give rise to such a stoneless clay as we frequently find imbedded in the great middle sand and gravel formation.<sup>1</sup> D. MACKINTOSH.

#### THE TROPICAL FORESTS OF HAMPSHIRE.

SIR,—In Mr. Gardner's lecture "On the 'Tropical Forests of Hampshire," in your January Number, he is reported as offering two suggestions in explanation of the occurrence of the remains of a temperate climate flora intermingled with that of a tropical one in the Lower Bagshot of Hampshire. One of these is an oscillation of climate which for a time left survivors of the previous flora lingering beside the new growth introduced by a change of climate, and the other the existence of a mean annual temperature which permitted the growth of either class of vegetation side by side.

As I believe both suggestions to be remote from the truth, and as the first of them is contrary to the general evidence afforded by the animal remains of the Eocene period in England, which appear to me to offer the strongest evidence against the existence of a glacial climate in Europe during any part of that period, perhaps you will allow me to offer what I believe to be the true explanation.

The remains upon which the determinations of this flora have been based are drifted, and not those of a bed *in situ* like the Coal-

<sup>1</sup> For full and accurate information concerning the Post-tertiary deposits of this country I would recommend Mr. H. B. Woodward's *Geology of England and Wales*. It is the only geological work in which an account of these deposits has been thoroughly brought up to the present state of discovery. Having gone over the greater part of the ground described in Mr. Woodward's work, and having previously written a work called "Scenery of England and Wales," I may be pardoned for stating that it exhibits more evident signs of great labour and care than any geological book I have read.—D. M.