

The Rev. O. Fisher pointed out to me that the greater depth could hardly be qualified by the word "much," and with his reasoning I for the most part agree.

I should, however, like to point out that the difference in temperature beneath the land and sea has by him, I think, been somewhat under-estimated. He takes the mean temperature of England as being 50° F., whilst that of the sea-bottom is 32°.

If we remember that the greater number of active volcanic bands lie within or near the tropics, we shall be compelled to take the land temperature at something above 50° F.

In Tokio, as recorded at the Yamato Yashiki Observatory, the mean temperature at a depth of 10 ft. is about 60° F. Farther south it will probably be much greater. This will make the solid crust beneath the sea more nearly 2000 than 1000 ft. thicker than that beneath the land, and this as a fractional part of the zone above rocks at the melting temperature I regard as a considerable amount. Even accepting Mr. Fisher's estimate of 900 to 1080 feet, the reason I have advanced for the peculiar position of volcanos will, I think, still hold good, if not for the whole of the phenomena, at least for a considerable portion of it.

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JAPAN, October 10th, 1880.

#### ON THE OLD RED SANDSTONE OF THE NORTH OF IRELAND.

SIR,—In the November Number of the *GEOL. MAG.* Mr. Kinahan makes some remarks on a paper of mine bearing the above title, to which I beg to make the following reply.

I am at a loss to know how Mr. Kinahan learns from the Survey Map that the Old Red Sandstone at any place "graduates" into the "fossiliferous Pomeroy Rocks." No fact is more clearly shown on that map than that these widely different formations are unconformable. The conglomerate in the townland of Aghafad I believe to be of Lower Silurian age.

I do not deny that there *may* be representatives of the Kiltoran beds in the North of Ireland, although I have not hitherto recognized them, believing, for the reasons stated in my paper, that the "Yellow Sandstones" of that district, characterized by the occurrence of *Modiola McAdami* and other marine fossils, are far more probably on the horizon of the Calciferous Sandstone of Scotland, and the Carboniferous Slate and Coomhola grit of the South of Ireland. As to the position of these latter groups, I beg to refer Mr. Kinahan to Jukes's *Manual of Geology*, where he will find them placed as I have done—at the base of the Carboniferous Limestone, and correlated with the Calciferous Sandstone.

The word "Upper" prefixed to "Old Red Sandstone of Waterford" is simply a mistake in the abstract of my paper, which does not occur in the original.

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