

ORIGIN OF LAKE BASINS.

SIR,—I observe that Mr. Judd, in the January Number of the GEOLOGICAL MAGAZINE (“On the Origin of Lake Balaton in Hungary”), asserts that he has “demonstrated that the basins of the largest lakes in our islands, in the Alpine regions of Europe, and in equatorial Africa, respectively, *could not possibly* have been formed by the supposed excavating power of ice.” (The italics are Mr. Judd’s.) He has also “shown,” he says, “that in each of these cases there is the strongest ground for believing the districts in question to have been subjected to powerful subterranean movements; and that these were quite competent to produce the depressions in question.” Finally, he waxes still bolder in the statement of his beliefs, and is evidently of opinion that all smaller rock-basins must have originated in the same way. What, then, is that magic process of reasoning which has enabled Mr. Judd to arrive, with so much confidence, at these uncompromising and comprehensive conclusions, and the cogency of which has appeared to him so great as to justify some very positive, not to say dogmatic, utterances, and a general oracular tone which is surely rather *de trop*? Briefly stated, his argument is as follows:—

Lake Balaton (30 or 40 feet in depth) occupies a depression, the longer axis of which coincides with a line of volcanic action; Lough Neagh probably lies in a preglacial hollow; the Valley of the Jordan, with its lakes (Merom, Tiberias, and Asphaltites), is probably an area of subsidence; Victoria Nyanza may perhaps owe its origin to volcanic disturbances:

These lakes represent the principal types of lake-basins which exist upon the earth:

Therefore rock-basins “*may* have had their origin in those changes of level resulting from the subterranean movements which have accompanied volcanic action;” and, “*as a matter of fact*, the largest lakes in the British Islands and in the Alpine regions of Europe, respectively, and not improbably the vast sheets of water in Central Africa also, *have been* so formed, and *could not possibly* be the result of glacier-erosion.” (These italics are mine.)

This is certainly a remarkable argument, but of a kind which, if it were taken for a model, might lead to curious results. For example, it would not be difficult to “demonstrate,” after this manner, that all men are born in lawful wedlock. Thus:—

A is a good man, B is a bad man, C is neither good nor bad but indifferent: all three may have been, and were, I believe, born in lawful wedlock:

A, B, and C represent very fairly the principal types of men:

Therefore, men may have been born in lawful wedlock, and, “*as a matter of fact*,” all are legitimate, and none can possibly be the offspring of unmarried parents.

Now I ask whether this brilliant syllogism is a whit less feebly-forcible and convincing than the argument upon which Mr. Judd has founded so much strong language. Exception might easily be taken to many of the author’s statements, but it is not

necessary to go over his paper in detail. He has advanced nothing new—nothing which has not already been answered by Professor Ramsay and others. One cannot help remarking, however, that it does seem strange that he should quietly ignore the fact that no supporter of the glacial erosion theory has ever asserted that all rock-basins are of glacial origin. Will he kindly tell us what glacialist has expressed disbelief in the existence of special areas of subsidence, or which of us has maintained that volcanic action and the movements accompanying that action cannot possibly have resulted in the formation of lake-basins. He states that I appear to assume that faults “can produce no effect at the surface.” I neither assume nor assert that such is the case, as any unprejudiced reader of the passage referred to by Mr. Judd cannot fail to see. Professor Ramsay and they who follow him have all along been careful to admit that lakes are by no means exclusively of glacial origin. They have not ridden their hobby to death, but this is just what Mr. Judd has done with his along the shores of “Lake Balaton in Hungary.”

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MR. JUDD AND THE GLACIAL EROSION OF LAKES.

SIR,—I have read Mr. Judd's paper on the origin of Lake Balaton in Hungary¹ with interest, and also his concluding observations, in which he proceeds to argue from the special to the general against the views of the “Scotch Geologists” regarding the glacial origin of lakes. I think it will occur to most readers, that however ably Mr. Judd has stated his case, his conclusions are not warranted by his facts; and that, in bringing the cases of certain large lakes in Ireland, Hungary, the Holy Land, and Central Africa, as evidences against the truth of the views propounded and illustrated by Professor Ramsay, he has not kept within that logical groove of reasoning for which most of his papers are distinguished.

Without wishing to enter the lists with the author of the paper, I venture to state two or three points on which his conclusions are, as it seems to me, open to objection. In summing up he says:² “We have demonstrated that the basins of the largest lakes in our own islands, in the Alpine regions of Europe, and in equatorial Africa, could not possibly have been formed by the supposed excavating power of ice. We have also shown that in each of these cases there is the strongest ground for believing the districts in question to have been subjected to powerful subterranean movements; and that these were quite competent to produce the depressions in question.” Well, we may admit that Lough Neagh, Lake Balaton, the great African Lakes, and, I will add, the Dead Sea and Jordan Valley, were not and could not have been formed by glacial erosion. But after this admission, does it by any means follow that Loch Lomond, Lough Doon,³ Windermere, the Welsh tarns and lakes, and some of the lakes on both sides of the Alps, were not so formed? Surely Mr. Judd will not venture

¹ *GEOL. MAG.* No. 139, January, 1876, p. 5.

² *Ibid.* p. 15.

³ See J. Geikie, “The Great Ice Age,” p. 294.