

Causes of Cosmical Changes of Temperature on our Planet.

It is admitted that the possible changes in the present meteorological conditions of our planet could not account for the great fluctuations of temperature recorded in the geological history of the glacial periods. Mr. S. J. Mackie, in the last number of the 'Geologist,' attributes these changes of temperature to changes of size of the sun's disk, to maximum and minimum periods of solar heat, etc. etc. It is clear these explanations, although possible, are purely arbitrary, mere speculations, unsupported by any cosmical or physical facts. Now, it is known that our solar system is travelling in space towards the constellation Hercules at the rate of $57\frac{1}{2}$ miles a second; yet so great are star-distances, that thousands of years elapse before our visible position in the heavens be changed to the naked eye. From the observations of Glaisher in his balloon ascents, it appears that the decrease in temperature is not in direct proportion to the distance from the earth; but, on the contrary, that a hundred feet elevation at the earth's surface produces as great refrigeration as a thousand feet at a greater elevation. It necessarily follows that we must arrive at cosmical temperature beyond the influence of atmospheric changes; but is this cosmic temperature uniform through the portions of space destined to be traversed by our solar system? If there be portions of space of different cosmical temperatures through which our planet has passed, this would account for the great cold of the glacial periods in a way supported by one strong fact, which is, that our position in the heavens is changing at the rate of $57\frac{1}{2}$ miles a second, and for this change of position not to affect the heat of our earth, we must suppose the cosmical temperature of space so traversed by our earth to be uniform, which would be a most arbitrary supposition. It is quite possible, nay even probable, that not only our own solar system, but all visible creation, the infinite and countless stars,—so remote, that their light has taken millions of years to come to our eye,—are all revolving through space around some almost infinitely far-off centre, which if luminous, its light is so attenuated by distance as to be invisible to us, and that the period of such a revolution may be long, beyond all calculation, during which immense portions of space must be traversed, most likely of unequal cosmic temperature, quite sufficient to account for the glacial periods in the geological history of our earth. There is nothing fanciful in this view, or beyond the range of probability. The vast magnitude of such a system is no objection to its existence, for, in comparison with infinity, all assignable distance or magnitude shrinks into a mere point. The immense period necessary for such a revolution would afford ample time for all the glacial formations recorded by geological observation, by admitting only the natural supposition that the temperature of infinite space is not uniform.

Yours, etc., DAVID LESLIE, M.D.

Carrickmacross, Ireland, May 21, 1863.

[It is not the intention of the Editor to reply to comments on his articles in all cases separately, but in one or two respects Dr. Leslie's letter requires notice. Mr. Mackie distinctly put forward the views in his paper as *speculations*; but Dr. Leslie is wrong in saying they are all unsupported by physical or cosmical facts. Neither is it admitted that possible changes of meteorological conditions could not have produced the cold of the glacial era. It may have been dogmatically asserted so. We should be glad to learn what temperature Dr. Leslie thinks existed then, and what were the fluctuations it was subjected to. We should also be glad to know on what grounds the idea of hot and cold regions in space can be maintained; and why the cosmical temperature of space should not be the real zero of temperature, or a condition of absence of all heat. We should like to know what is the presumed temperature of the cold cosmical space through which our globe is so hypothetically supposed to have passed in the glacial age.—ED. GEOL.]