

When in the mine alone and all work is suspended, I have frequently heard strange and unearthly (?) sounds, such as rattlings, scratchings, knockings, etc.—noises called “nackings” by the men. In Yorkshire I have heard of bumps of such magnitude taking place as to throw down large areas of roof in worked-out parts of the pit, and which created a blast in the air of the mine strong enough to knock men over, upset tubs, blow open doors, put out lights, and cause much havoc.

Subterranean rumblings, as is well known, have for several years been heard, and felt too, beneath and in the vicinity of the town of Sunderland; but these are considered to be due, not to coal-mining, but to the dissolution of the magnesian limestone by water which is constantly being pumped through it.

Now, it appears to me, that there is one common cause for all these “explosions,” “bumps,” “nackings,” etc., which is simply this: the upsetting, by the excavation, of the equilibrium of the strains or pressures holding everything fast and firmly together—the removal of the support thereby causing the rocks to get relief and to fly off or apparently to explode. I look upon the phenomena as *miniature earthquakes* in fact.¹ I question very much whether gas has anything to do with these bumps, etc., even in coal-mines, but that they act upon the gas is exceedingly probable. The phenomena are certainly often very striking, and would seem to be worthy of much more attention than they have received. With Mr. Strahan’s last paragraph I quite agree.

W. S. GRESLEY, F.G.S.

OVERSEAL, 8 Sept. 1887.

THE DATE OF THE ICE AGE.

SIR,—Some time ago you inserted a letter of mine in which I contended that a high eccentricity of the earth’s orbit and winter aphelion would not produce all the effects which Dr. Croll assigned to them. I venture now to give some reasons for thinking that the Glacial Period did not occur so long ago as Dr. Croll’s theory supposes. His principal maximum of eccentricity took place 800,000 years ago, while the last large maximum was about 210,000 years ago. Can the Ice Age have been as remote as this?

I have just returned from a visit to the Lake District, the glacial phenomena of which have been very fully described by Mr. J. Clifton Ward. The traces of ice-action along the sides of the mountains bordering the Valley of Borrowdale are remarkably numerous and well-defined. The sides of these mountains are usually steep and pretty bare, and the rainfall of the district is enormous. At Seathwaite, situated at the head of the valley, Sir John Herschel gives the annual rainfall at 141 inches, and Ramsay at 113 inches. No doubt the rocks are hard volcanic rocks which would stand a good deal of wear; but would the ice-markings be as

¹ I recollect seeing it stated in a newspaper a few years ago that the wife of the colliery manager was dislodged from her seat in the house in Nottinghamshire at the same moment that a very heavy “bump” occurred in the workings of the colliery below, which at the time was, by some, attributed to an earthquake.

distinct as they are if these steep mountain-sides had been exposed to annual rainfall of 100 inches for the last 200,000 years?

Above Grasmere there is a small lake, known as Easdale Tarn, which seems to have been partly formed by a terminal moraine, while earlier ice-markings down the valley seem to indicate that the glacier formerly pursued the same course which the stream from the tarn now follows. Though the drought of the season had been remarkable this stream was not a very small one, yet the work of erosion done by it since the Glacial period was not of a very startling description. It was not what I should expect a rapid mountain-stream (though checked by a small tarn) to effect in 200,000 years.

Such phenomena are by no means peculiar to the Lake District. The great fall of Niagara seems to be an example. There is, I believe, no trace of an earlier post-glacial river-channel. On the contrary, the ice-markings almost down to the water's-edge above the fall seem to show that the glacier followed the same track as the river. The river must, therefore, have commenced cutting out of the gorge as soon as the ice-cap cleared away. But Sir Charles Lyell estimated the time necessary to cut out this gorge at 35,000 years, while others have placed it as low as 12,000. Professor Winchell has estimated the time required to cut out the gorge below the falls of St. Anthony at 8000 to 10,000 years. I am not aware that there is any reason to think that this excavation did not commence until long after the close of the Ice Age.

Man probably existed on the earth in the Glacial, if not the Pre-Glacial, era. But is there any reason to suppose that he existed for at least 200,000 years without making any solid progress in civilization, and then suddenly made the great advances (emanating apparently from more than one centre) which has taken place in the last 10,000 (or perhaps 6000) years? It is not a case of an anthropoid ape slowly developing into a man during a period of 200,000 or 800,000 years; for the earlier skeletons appear to be those of fully-formed men.

For these reasons I think Dr. Croll refers the Ice Age to too remote a period. Further researches on the amount of post-glacial erosion and the erosive power of the streams or rivers engaged in it ought, I think, to enable us to decide the question one way or the other with a tolerable degree of certainty.

DUBLIN, *Sept. 5th*, 1887.

W. H. S. MONCK.

DR. HINDE ON THE ORIGIN OF CARBONIFEROUS CHERT.

SIR,—Permit me to reply to the article by Dr. Hinde, F.G.S., which appears in the *GEOLOGICAL MAGAZINE* for the present month (No. 280, p. 435). As I had an opportunity when attending the meeting of the British Association in Manchester of hearing the paper read in Section C, and as I had previously had the pleasure of a visit from its author in this city, I was not unprepared for the onslaught which afterwards took place. I have no wish to maintain a position which subsequent investigation has shown to be untenable, or which requires readjustment; and I am, therefore, quite ready