

radio-thermal energy. The actual distribution of the continents may therefore be the result of their geological history. Their lateral restriction presents a more fundamental problem, and if it cannot be correlated with the birth or former proximity of the moon, it will be difficult to discover any other external constraint capable of providing an explanation.

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May 5.

The Cresswell Engravings.

THE account in NATURE of May 2, p. 658, of the excavations at Cresswell Crags, and the discovery of engraved bones, calls for some comment from me as being the first to cast doubt on the authenticity of the engravings. Some time ago, and before the meeting, I expressed the opinion to my fellow cave-worker, Mr. A. Leslie Armstrong, that the markings

panying photograph (Fig. 1) shows a small portion of this eroded surface, slightly above natural size. I cannot see the slightest difference between the markings on this skull and those on the three Cresswell bones. The misinterpretation placed upon the markings on the latter mars what is otherwise an important piece of work. I can speak with some knowledge about Mr. Armstrong's skill as a cave-digger.

The Pin Hole example is a genuine artifact and is of ivory, as reported to Mr. Armstrong and to Sir William Boyd Dawkins. It has been engraved with a conventional pattern by human agency, and contrasts strongly with the three bone fragments from Mother Grundy's Parlour.

It should be pointed out that the Mills mentioned in the previous account should be Mello.

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May 12.

Effect of High Tension Electric Fields upon the Discharge of Locomotive Gases.

OWING to the simultaneous use of steam and electricity on the Swiss railways during the process of gradual electrification, a curious physical phenomenon is seen when the mixture of smoke and vapour from a steam locomotive comes within the electric field produced by the overhead conductors, which operate at a pressure of 15,000 volts, and a periodicity of 17 per second.

Under certain conditions the smoke and steam particles are seen to be in violent agitation, very rapid and rhythmical. The phenomenon is not readily observed, the special conditions requisite for its production being realised only on rare occasions. It is not observable in the compact white clouds sent out by a heavily loaded locomotive, nor during the emission of dark smoke just after firing; neither is it seen during the heavy discharge from a locomotive while starting a train. The most favourable conditions appear to occur during periods of minimum discharge of steam and smoke, when the singular palpitation suddenly appears and just as quickly disappears.

Owing to the fugitive nature of the phenomenon it is difficult to count the number of palpitations, but they are certainly of the same order as the alternations in electric tension. This and the requisite attenuation of the water droplets seems to indicate an essentially electric origin for the phenomenon. On the other hand, it is evident that the appearance is in no way connected with electrical discharge of the kind frequently seen between clouds in a thunder-storm, because the palpitation is invisible at night.

During the day-time the palpitation is seen most clearly when the discharge from the locomotive appears "dark grey" against a bright background of sky, or when it appears as a white cloud against an overcast sky. Both these conditions point to an alteration in opacity and, correlatively, an albedo of the cloud mass, caused by a series of alternate condensations and re-evaporations occurring in synchronism with the variations in electric field. Apparently, under certain conditions of saturation, a positive charge will favour the formation of drops, whereas a negative charge leads to their disappearance by evaporation in the warm gases.

In order to test the above explanation I attempted an experimental laboratory verification, using a Klingelfuess induction coil which was controlled by a Roget helix dipping in mercury, and breaking the circuit 10 or 12 times per second. The pressure at the terminals reached about 40,000 volts. The spark



FIG. 1.—Portion of an eroded human skull, with (below) tracing made to show animal heads by outlining some of the eroded grooves.

on the three bone fragments from Mother Grundy's Parlour were due to the action of roots. I also told him it was a mistake to outline the figures in Chinese white. At a later date the bones were submitted to Sir William Boyd Dawkins and he brought them in to me for an opinion. I was able to convince him, by means of similarly marked bones in the Manchester Museum from excavations of various dates, that, beyond the two convergent incised lines on the "rhinoceros" piece, the markings on the three bone fragments were due entirely to root-action and were not of human origin.

The most convincing piece of evidence is a human skull from a tumulus near Holyhead. The outer surface of this skull is scored in all directions by characteristic half-tunnels formed by the action of roots, and it is quite easy by following certain of the grooves to make animal figures of them. The accom-