volts, would be surrounded by an electrostatic field of relatively feeble intensity. For example, the electric intensity at the surface of a charged conducting sphere of radius $6 \cdot 4 \times 10^8$ cm. (radius of earth) at a potential of 10^6 E.S.U. (300 million volts) is 1/640 E.S.U. per centimetre (0·47 volt per centimetre), and the surface density of charge $1 \cdot 24 \times 10^{-4}$ E.S.U. per square centimetre, so that a spherical shell of atmosphere only 1 kilometre in thickness charged with electrons at a concentration of 2·6 electrons per cubic centimetre would suffice to give the earth a negative potential of this value. It is, therefore, possible for the earth to possess a potential of this order, with no striking consequences at its surface.

In seeking a possible origin for such a charge, it is natural to examine Størmer's theory of the polar lights, according to which streams of charged corpuscles enter the atmosphere at comparatively small velocities. If these are assumed to be electrons of solar origin, it is evident that in such a stream the earth, simulating the grid of a triode, would assume a negative potential, the value of which depends on the numbers and energies of the solar electrons, and on the rate of loss of negative charge by it due to the capture of positive corpuscles and the escape of electrons from the atmosphere. In the condition of equilibrium, electrons expelled from the sun with energies of some millions of volts would approach the earth with greatly reduced velocities, and the electrostatic field due to the earth's charge, by spreading the incident beam, would probably assist the magnetic field in directing the electrons into the polar regions.

The large energies of cosmic corpuscles may accordingly be supposed to be derived indirectly from the sun acting in combination with the earth to form a cosmic electrostatic generator of the Van de Graaff type, which maintains the earth at a large, but not of necessity constant, negative potential.

Thus, the hypothesis, which I have suggested above, of a charged earth, affords a simple explanation of the two principal features of cosmic corpuscular radiation, namely, the enormous energies of the corpuscles and the absence of any favoured direction of approach. It suggests that the incident corpuscles are similarly charged and of comparatively local origin, and it is at the same time consistent with the observed fact of the small velocities of approach of the corpuscles responsible for the polar lights.

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The Museum of Practical Geology

IN the article on the Museum of Practical Geology in NATURE of July 28, p. 129, it is stated that the Treasury allotted £300 a year for the upkeep of the "Ordnance Geological Survey". While, however, this is the impression to be gained from published sources of information, the actual facts are, briefly, as follows :—

In 1832, De la Beche offered to colour geologically "eight sheets of the Ordnance Map of England, comprising Devon, with parts of Cornwall, Somerset, and Dorset" for the sum of £300. In 1835 he informed the Board of Ordnance that the maps had been completed, and suggested that the work should be extended to other areas. Following upon a favourable report by a small committee representing the Geological Society (comprising Lyell, Sedgwick and Buckland), the Government decided "to direct the continuance of a Geological Survey on the scale of the Ordnance Maps". Col. Colby reported that the probable cost would be £1,000 per annum, "independent of any salary which it might be deemed proper to give to Mr. De la Beche".

Behind these bare statements of fact there lies an extremely interesting story which throws much light upon the state of geological knowledge at the time, and upon the perseverance of De la Beche himself. A mistake in the identification of certain strata by De la Beche jeopardised the scheme almost before it was fairly launched, and but for the sympathetic interest displayed throughout by Col. Colby it might well have been completely wrecked.

For some years past I have been gathering material relating to this phase of geological history, and, through the kindness of Col. J. I. D. Nicholl and Mr. H. S. Gordon (the former a descendant of De la Beche, and the latter of Buckland), also Prof. Sollas and the Director of the Ordnance Survey, have been able to peruse much relevant correspondence. There are, however, still gaps in the story, and I shall be grateful to receive news of unpublished letters that passed between the pioneers (especially De la Beche, Buckland, Conybeare, Lyell, Sedgwick and Murchison), should any such letters be in the possession of readers of NATURE.

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Origin of the Wever and Bray Phenomenon

IT has been shown by Witmaack and more recently confirmed by Kaida[1], that following division of the VIII nerve in the cat central to the peripheral cochlear and vestibular ganglia, the ramus cochlearis fails to conform with the well-known Wallerian law in that the nerve elements including the spiral ganglion distal to the point of section undergo degeneration. In the following experiment, use has been made of this fact to adduce evidence bearing upon the problem of origin of the potential changes generated within the intact mammalian cochlea, in response and of a frequency corresponding to physiologically applied sound waves (Wever and Bray phenomenon).

Unilateral section of the VIII nerve was carried out in a full-grown cat. Six months later the electrical reactions of the two cochleæ were investigated. On the unaffected side, the Wever and Bray potentials, as also the potentials in the corresponding auditory tracts, were found to be of high amplitude and were recorded after suitable amplification upon moving cine-bromide employing a cathode ray oscillograph. Upon switching over to electrodes already placed in position upon the affected cochlea and corresponding auditory tracts, no response could be elicited to any frequency (100∼ – 6000∼) using higher intensities of sound (some 40 decibels) with maximum amplification.

Intra-vital fixation of the two ears was at once carried out. This procedure followed by celloidin embedding made possible a highly critical examina-