

Fundamental Physical Structure

THE suggestion by Dr. Drysdale, in NATURE of August 13, that by resorting to the experiments and equations of Ampère relating to the forces between current-carrying conductors, magnetism may be eliminated from fundamental physical concepts, reminds me that in the course of conversation with the late Sir Horace Lamb some years ago, he remarked that it would greatly simplify mathematical treatment if we could dispense with the duality of electricity and magnetism and concentrate on one of them, as Ampère appeared to have done. The hint was the more impressive because Sir Horace, in his "Hydrodynamics", had set forth the vortex theory so convincingly.

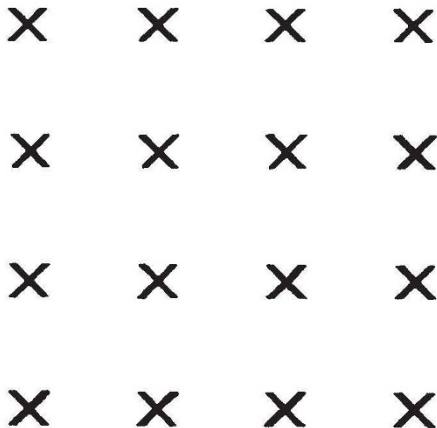
What Dr. Drysdale now does is to substitute the force corresponding to the product of charge and velocity of a proton or electron, for Ampère's current-element force, thus eliminating the magnetic link. It is difficult to dissociate permeability from what Dr. Drysdale designates "magnetic considerations", but presumably it would take its place as a general variable in the concept.

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A Binocular Illusion

I WAS much interested in Sir Richard Paget's letter in NATURE of July 9, as I have observed the converse effect, in which a 'suspended image' may be seen behind the pattern viewed.

The effect may be obtained by drawing a simple pattern (for example, of crosses, as in the enclosed sketch) enlarged so as to give a suitable interval between the elements: this is rather less than the distance between the eyes (in my case, two inches for an eye interval of two and a half inches). The



pattern is held at a suitable distance—about twelve inches—and the eyes relaxed: having persuaded the blurred images to coincide so that one element is superposed on its neighbour's image, the eyes are focused without losing this superposition, that is, without turning them inwards to their original position. The illusion of a magnified image behind the object is assisted if the eyes are permitted to move over the pattern or blinked, or if the pattern is moved slowly towards and away from the observer.

A chessboard held diagonally is a suitable pattern, but the illusion is much more striking with an object such as wire netting, and I have found a window

pane of frosted glass with a pattern of stellate clear patches (at the appropriate interval) very effective indeed: the most favourable conditions, however, require a little practice and patience.

The optics of this phenomenon are of course similar to those of Sir Richard's version. The eyes are focused for an object at a certain distance, but the angle subtended by their respective lines of sight is appropriate to an object at a greater distance.

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Antarctica and Glacial Ages

As geologist to the British Graham Land Expedition, I should like to direct attention to certain mis-statements which appear in Prof. E. W. MacBride's recent article¹ concerning the geological discoveries which our expedition made in the Antarctic.

Prof. MacBride states: "The part [of Antarctica] so far principally studied is that directly south of South America, in which lies the inlet known as the Ross Sea". A glance at the map will show that the Ross Sea is some 100°–120° of longitude west of South America. Our expedition was working in what is commonly referred to as the West Antarctic, which is south of South America but very many miles from the Ross Sea. Further, Prof. MacBride states that we collected from the Beardmore glacier erratic rocks "of the Gondwana age, with coal-seams carrying characteristic fern plants". He probably has in mind the Permo-Carboniferous plant remains which were collected by Captain Scott's polar party from the region of the Beardmore Glacier, and which were described by Sir Albert Seward. The Beardmore Glacier is nearly 2,000 miles from the region we visited. The only plant-bearing deposits we found were from the eastern shore of Alexander the First Land, and are probably Middle Jurassic but certainly not Permo-Carboniferous or "Gondwana" in age. As a result of Prof. MacBride's mis-statements it is difficult to understand what geographical relation he assumes the Antarctic Permo-Carboniferous deposits bear to the presumed continent of Gondwanaland. Consequently it is doubtful how far the arguments which he bases on their distribution may be regarded as relevant.

Prof. MacBride states that Antarctica entirely escaped the "Gondwana ice-age", but since no rocks of Permo-Carboniferous or "Gondwana" age have yet been found in West Antarctica (which, it should be remembered, is markedly dissimilar from the region round the Ross Sea both as regards the geological formations that occur and their tectonic structure), no certain conclusions can be drawn as to the climate of this part of the continent in "Gondwana" times.

In recent years many lines of evidence have accumulated to suggest that during past geological ages various parts of the earth's crust drifted relative to one another and to the axis of the earth. The widespread distribution of a characteristic Permo-Carboniferous flora throughout many lands, which are now widely separated, is of particular significance. There is also evidence to show, as Prof. MacBride points out, that drifting may still be going on at the present day, at all events in certain parts of the world. It is hard to escape the conclusion that continental drift is one important contributory cause