

in the movement. If existence means what is all here and now, it is difficult to see in what sense these latter, the essence of which is just not to be all here and now, can be said to exist. If, on the other hand, it means that which appears or expresses itself in what is here and now, it is difficult to see how we can assign more to the here and now than the shadowy form of the really existent. Finally (and this brings us back to what Sir James Jeans has probably in view) we have the difference between the particular and the universal, in the ordinary sense: the difference (to confine ourselves to the physical) between the pen and the law of its mass, where the same difficulty again meets us—the difficulty that has engaged philosophers from the time of Plato to the present day, and has led some of them to deny existence to that which appears to sense except as ‘the moving image’, or perceptible embodiment of an intelligible essence.

Whether these distinctions throw any light on the controversy as to the existence of ether it is not for a mere metaphysician to say. But it suggests at any rate that while those who maintain its existence may be making a mistake in thinking of it in terms of something that is continuous with the world of the felt, waking body, or as something that can be said to fill space, they yet may be right in insisting that the word stands for an element in that world which the resolution of it into mathematical symbols or ‘pointer readings’ fails to make intelligible. What is emerging more and more from the treatment of the world of sense perception from a philosophical point of view, is that, do what we can by our constructions, algebraic or other, to express it in conceptual terms, there remains, as a surd, an element of inexpugnable givenness, which must be taken not only as ‘existent’ but also as the source of the real existence of everything else belonging to that world.

Other questions of interest both to the physicist and the metaphysician are suggested by Sir James Jeans's reply—chief among them the sense in which he would admit the existence of what it has come to be fashionable to call ‘values’ of which truth, beauty, and goodness are stock examples. Do these, as some things he has elsewhere said seem to imply, occupy a world apart from existing things? Or are they, as Prof. Whitehead insists, a side of them apart from which no intelligible account can be given of them? But this is another story carrying us far beyond the particular point to which the discussion refers.

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Meteorological Conditions during the Air Raid on London, Oct. 19-20, 1917.

IN NATURE of Nov. 29, 1930, p. 847, Col. E. Gold, discussing upper air conditions, states that the note under “Historic Natural Events”, in NATURE of Oct. 18, 1930, p. 633, gives a misleading impression of the cause of the high winds at an altitude of 10,000-20,000 feet on Oct. 19-20, 1917. A true explanation of the air structure which led to the loss of four German airships is of some importance, though not bearing directly on the loss of the *R101*. In “Aids to Forecasting” (M.O. Geophysical Memoirs, No. 16) types IV. and VI. are listed for Oct. 19 and 20, 1917. The former shows ‘lows’ north-west and north-east of the British Isles, and the latter an advancing ‘low’ with characteristic pressure gradients. For Oct. 21 the type indicates a deep *V. low*.

Col. Gold is of opinion that although there was no

pressure gradient at sea-level, there was a steep west to east gradient at great heights, due to a steep horizontal gradient of temperature also from west to east. Such a wind was a thermal wind only, and surface pressure “had nothing to do with the case”. Trustworthy records are meagre, and the argument for the assumed steep horizontal temperature gradient and thermal wind rests mainly upon a record at Ipswich on the forenoon of Oct. 20, which shows an isothermal condition at 4400 metres. The case is discussed by Sir Napier Shaw in his “Manual of Meteorology”, part iv., p. 112, and it may be that the record rightly tells of the remnant of a tongue of relatively warm air passing east. The important point, however, is that at the ground there was little or no wind, and with clear skies radiation had full play. There was no convection, and so a characteristic ground radiation fog formed. In other words, there was a temperature inversion in the lowest level, whatever happened above. London had no need of anti-aircraft guns that night. Its citizens slept in quiet, unaware that four of a fleet of eleven airships were overhead, laden with bombs. Nature provided a defence which cost nothing, was noiseless, and thoroughly effective.

The whole story of that great air raid will probably never be made public. Owing to failure of radio and loss of touch with Nauen, the ships went astray. From midnight to 7 A.M. of Oct. 20 they moved south-east instead of east, unaware apparently of drift, unless the course was in error. If there was a northerly wind at 4400 metres it had little or no strength at lower levels, and the airships probably flew low for several hours, seeking to penetrate the fog and locate themselves. What saved London was not the northerly wind at high levels but radiation fog at the surface. For forecasting purposes in connexion with aviation, the likelihood of fog at low levels would seem to be a matter of prime importance.

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I THINK Prof. McAdie's view of the vital importance of fog in aviation will command general assent, and I am not acquainted with anything contrary to his suggestion that fog prevented the German airships finding their objective on the occasion in question. This, however, does not explain why the airships drifted so far south and failed to return to their bases. The strong northerly winds at great heights, of which the ordinary weather maps of surface conditions gave no definite indication, do furnish a reasonable explanation of this fact.

I do not think the existence of these northerly winds admits of doubt: they were actually observed by pilot balloon in north-east France on the night of Oct. 19, 1917, at a height of 14,000 feet. Nor do I think there is any doubt about the existence of the steep horizontal gradient of temperature: with the distribution of surface pressure which existed at that time, there could not have been strong northerly winds at great heights without a steep horizontal gradient of temperature. The question on which there may be difference of opinion is, whether the northerly winds were the cause or the effect of the horizontal gradient of temperature (if one can speak of cause and effect in connexion with phenomena which must co-exist and which must develop together).

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