

Letters to the Editor.

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Relativity and Materialism.

PROF. WILDON CARR has for a number of years been busily engaged in ringing the death-knell of materialism. I was therefore not a little surprised to read in NATURE (October 20) his statement that Einstein's theory was the "death-knell of materialism." I thought, from my previous acquaintance with Prof. Carr's writings, that Bergson, Croce, and others had already done all that was necessary in that direction. But no! Prof. Carr has resuscitated it for the express purpose of killing it once more. That unfortunate doctrine seems to exist mainly for the purpose of being periodically slaughtered by professors of metaphysics; and we are led to the conviction that materialism must have very singular properties to survive so many tragic executions.

Well, it does possess a property which must naturally appear singular to those steeped in metaphysics—it happens to be true. Scientific materialism, as now understood, does not profess to be a rounded or final system of philosophy: it is merely a name for a few general principles, laid down by science, and selected for emphasis on account of their high human significance. Science makes new knowledge; philosophy (rightly understood) does not; it simply collects together certain principles yielded by science, those principles being selected as having some bearing on the deep undying problems of most profound human interest.

Among the scientific principles thus selected and emphasised by materialism—and the only one among them still seriously controverted—is that which states that mind cannot exist apart from matter, or as I prefer to put it, that mind is a function of material organisms. Prof. Wildon Carr is of opinion that mind *can* and *does* exist apart from matter; and he is under the impression that this opinion is justified by the principle of relativity. So far as I can follow his argument, it amounts to this. Space and time are relative to the observer; therefore the existence of an observing mind must be antecedent to the existence of space and time. True; but space and time are not matter: they are not objective things; you cannot weigh them or touch them; they are part of the mental framework which we erect for our convenience in dealing with external nature. They are concepts; just as the number 10 is a concept; not a thing, but a framework into which things can be fitted. "For the concept of relative space-time systems the existence of mind is essential." Prof. Carr might with equal profundity have said that for the presence of dew the existence of water is essential. Dew is aqueous; a concept is mental; but let me inform Prof. Carr that neither one nor the other of these propositions gives the slightest qualm to any scientific materialist, nor have they the least relevance to the question whether or not mind depends upon matter. We are not concerned with "concepts," which, of course, imply the previous existence of mind, but with objective *things*.

Now Prof. Carr argues that the "space-time

system," involved by relativity, is conditional on the existence of mind. Very well then. It follows that if mind were to be extinguished throughout the universe, the laws at present ascribed to the universe would cease to operate, or perhaps the universe itself would cease to exist. Now that is an altogether incredible proposition. If Prof. Carr's mind were to be extinguished, the laws of nature would still remain as they are. If everybody else's mind were also to be extinguished the laws of nature would be unaltered. "Concepts" would vanish no doubt; but the validity of the principle of relativity itself does not depend on the existence of a mind which can testify to it. Prof. Carr exhibits that incurable confusion between concepts and objects which is common to all those who think that metaphysics is a rival method of science in the making of new knowledge.

Relativity of space and time no more conflicts with scientific materialism than does relativity of motion. But it is idle to argue with sentiment, and it is with sentiment alone that we have to do—sentiment unsupported by a fragment of evidence, and asserting itself in flat contradiction to every principle of logic. As a mere statement of truth, materialism will always reign, as it has reigned now for centuries as the basis of scientific experiment. But on a show of hands it will always be in a minority; its reign is that of an uncrowned king. There exists a wide and universal human sentiment which loathes materialism. That sentiment comes out in many different forms: in the vulgar superstitions of the uneducated, in spiritualism, in metaphysical dissertation. They are but the same deep sentiment on different intellectual grades, but as false and rotten in the higher grades as they are in the lower. Everywhere it comes out: in physiology we find it as vitalism; among the public at large it supports religion, the most powerful single factor that has moulded the destinies of civilised humanity. Materialism must always be unpopular; that is why it is so often being killed. But it is true; that is why it never dies; that is why it never will die; unless, indeed, it is one day drowned in the floods of oily sentimentalism.

Two hundred and fifty years ago the world of physics was fermenting as it is now. Newton was introducing a revolution of thought, comparable to the revolution of the last twenty years. Then, as now, the sudden upsetting of old ideas had in some sense a demoralising effect. There seems a real danger that metaphysics may take root, for a brief period, amid the general disorganisation consequent upon the revolution. A spectator does sometimes see most of the game, and I trust it may not be considered presumptuous in a spectator to sound an old note of warning at a time when many insidious invasions of science are being attempted by metaphysics: "Physics, beware of Metaphysics."

November 18.

HUGH ELLIOT.

Metallic Colouring of Beetles.

IN reference to Mr. Onslow's letter on this subject in NATURE of November 17, I may say that it requires some care to prepare specimens for the pressure test. The chitinous coat is thick, and is softer below than it is at the colour-producing surface. The inner layers should be removed so far as possible, and the test-piece (which should not exceed 1/50 in. in diameter) cut from the remaining part.

In my experience, when these conditions are attended to the colour vanishes under pressure, and