inclination of successive molecules to one another would be altered just as is the case in the crystalline state when an ester is converted into an acid, and, in the second place, the length of the zig-zag composed of a finite number of molecules would be shortened. If the chains of the molecules commence at the interfaces between the isotropic and anisotropic regions, then the chemical change will produce a tension along the length of the fibre.

When a contraction wave passes along a muscle fibre the hydrogen ion concentration in the muscle increases, due to the production of lactic acid from glycogen, so that the chemical changes occurring during stimulation are sufficient to account for the conversion of a salt into an acid and of an expanded into a contracted molecular film, and hence for the tension along a muscle fibre. W. E. GARNER.

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Ether and the Metaphysical Mind.

DR. JEANS states in his Kelvin Lecture to the Institution of Electrical Engineers, published as a Supplement to NATURE of March 7, that our own physicists have asked for a machine, while "the more metaphysical minds of the Continent have usually been content to accept action at a distance." He goes on to say "it is something more than a coincidence that Newton, Clerk-Maxwell, Kelvin, and Faraday are all British, while Boscovitch, Einstein, and Weyl are not."

Of the three men chosen as typical of the more metaphysical minds of the Continent, all are mathematicians primarily, while two at least of them are of eastern origin—Slavonic or Jewish. These men are therefore representative—if genius is representative of anything—of eastern rather than western Continental thought. Two natural philosophies are apparently now available—a natural philosophy based upon essentially British lines of thought as represented by Newton, Clerk-Maxwell, Kelvin and Faraday, and a natural philosophy based upon an eastern philosophical outlook. Does this not perhaps account for the difficulty that relativists are finding in getting this new plant of eastern origin to take root in British soil? Dr. Merz, in "A Fragment of the Human Mind," pp. 18, 24, 25, etc., has pointed out more than once that when an *impasse* is reached in a discussion of some philosophical question, as, for example, in "Hume's dilemma," it is characteristically British to appeal to common sense.

We appear to be witnessing not so much the birth of a new theory, for there are already half a dozen or more species of relativity theory — Einstein's, Eddington's, de Sitter's, Weyl's, Silberstein's, Whitehead's, Robb's, and so on—as the birth of a new branch of knowledge—*mathematical metaphysics*.

Just as there have always been minds that prefer physics to metaphysics, so there will always be minds that prefer mathematical physics to mathematical metaphysics. The former will draw their inspiration, meantime, from the Larmor-Thomson-Lodge School; the latter from the Einstein-Eddington-Jeans School. The essential distinction between them appears to be that one demands "a machine," *i.e.*, a mechanical (not necessarily Newtonian) model of the physical universe, built in normal space and time; whereas the other is content with describing it through the medium of a mathematical analogue or map. Many of us would be well enough pleased to possess either —the model or the map.

F. F. P. B.

The Migrations of the Painted Lady Butterfly.

ELSEWHERE in this issue (p. 535) is a short account of our present, very incomplete knowledge of the migrations of the Painted Lady butterfly (*Pyrameis cardui*). This article has been written with the sole object of obtaining co-operation in a problem which can only be solved by the combined efforts of a number of observers who know what to look for and are kept interested by knowing what relation their observations bear to the whole question.

As is stated in the article, only in Western Europe, North Africa, and Palestine is there any possibility of piecing together the hundred or so known records, and even in this area the conclusions will not be trustworthy until the records are ten times more numerous. In the rest of the world, and particularly just to the south of the Palæarctic Desert belt, in Nigeria, Senegal, and the Sudan, for example, every record is of the greatest value, and any one may help to give the clue to the mystery of the origin of the flights which reach the North African coast.

May I, therefore, ask any interested person in any part of the world to publish—or to send to me—notes on the seasonal abundance of *Vanessa cardui* in his district, and particularly on any sudden appearances or disappearances of large numbers, and in general any notes or observations relating to the migration of this or any other insect.

Records of actual migrations should include the locality, date, species, approximate numbers, sexes (if possible), direction of the flight and of the wind, and any other notes on the meteorological or biological conditions. If, in addition, specimens actually caught on migration could be sent to me for examination and dissection, I should be very much obliged.

All original notes and observations sent direct to me will be published, as in the past, with full acknowledgments if of sufficient interest.

C. B. WILLIAMS.
(Acting Chief Entomologist.)

Ministry of Agriculture,
Cairo, Egypt,
January 14.

The Spectrum of Potassium excited during its Spontaneous Combination with Chlorine.

THE spectrum of ionised potassium has been studied by many scientists by exciting the vapour with the condensed spark, electrodeless ring discharge, and electronic impacts. I have been recently studying the spectrum emitted by potassium burning in chlorine at normal pressure *spontaneously*, and have obtained the following interesting results.

The photographs taken with the quartz spectrograph show a very strong emission band in the red extending from about 7200 to 6150, corresponding to the emission and absorption bands obtained by McLennan and Ainslie in the fluorescence and absorption spectra respectively of dense potassium vapour. Besides this, many arc lines of moderate intensity and the following *enhanced lines* are seen:

4466, 4388, 4307, 4220 and 4115.

As the slit was kept fairly broad, some of the wavelengths given are the mean values for lines very close to each other.

These results show that the *electron affinity* of the chlorine atom, together with the temperature attained by the potassium vapour as a result of the chemical reaction, must account for the excitation of the *enhanced lines* in the absence of any external electrical forces. I am following up the work in connexion with the remaining alkali metals. A