

some tools (Late Acheulean) comparable to the Nanyukian. The latter stage was found by Dr. J. D. Solomon on the slopes of Mount Kenya in a rubble which was regarded as marking the Kamasian-Gamblian Interpluvial.

Therefore, the first climatic break in Pluvial II, Uganda, and as recorded in Bed III Oldoway, was a much earlier affair than I suggested.

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### Kelvin and the Age of the Sun

WHEN the age of the sun is discussed, it is often assumed that Kelvin asserted quite dogmatically that the age of the sun could not exceed 20,000,000 years. It is well, however, to turn to his own words on

"The Age of the Sun's Heat" in a lecture printed in *Macmillan's Magazine* in 1862 and reprinted in his "Popular Lectures and Addresses" (vol. 1), published by Messrs. Macmillan and Co. On p. 368, he wrote that it seemed most probable that the sun had not illuminated the earth for 100,000,000 years and almost certain for not exceeding 500,000,000 years. "As for the future, we may say, with equal certainty, that inhabitants of the earth cannot continue to enjoy the light and heat essential to their life, for many million years longer, unless sources now unknown to us are prepared in the great storehouse of creation." The concluding words display the prescience of this great man of science, much of whose work has now become so familiar that we have forgotten that it had ever to be brought into being.

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### Points from Foregoing Letters

THE average time that an atom of phosphorus spends in the body of a rat which has been fed with sodium phosphate is about two months. This is the conclusion to which O. Chiewitz and Prof. G. Hevesy have come by feeding rats with small quantities of sodium phosphate containing radioactive phosphorus as indicator, and analysing the excreta of the animals and their organs after death. The authors further believe that the formation of the bones is a dynamic process, involving continuous loss and replacement.

By the bombardment of magnesium with  $\alpha$ -particles, Dr. C. D. Ellis and W. J. Henderson have obtained, in addition to aluminium of mass 28, already known, two other radioactive products. One of these emits electrons of 11 min. period and the other positrons of 5-7 min. period; the authors suggest that these two radioactive products are, respectively, aluminium of mass 29 and silicon of mass 27.

H. J. Walke suggests that potassium of mass 43 should have a radioactivity of less than 16 hours, which is the radioactive period of potassium of mass 42; it could not, therefore, account for the long-period radioactivity of ordinary potassium. This has been attributed by Newman and Walke and by Klemperer to radioactive potassium of mass 40, and H. J. Walke now directs attention to recent publications supporting this latter hypothesis.

An electron density map of a molecule of resorcinol is given by Dr. J. Monteath Robertson. This is the first example of an organic molecule which has yielded to quantitative X-ray analysis without the aid of symmetry components in the molecule itself. The complete structure is determined, and it is shown that the hydroxyl groups belonging to adjoining molecules approach to within 2.66 Å., indicating the presence of hydrogen or 'hydroxyl' bonds between the molecules.

A suitable method for preparing colloidal dispersions of a cancer-producing substance, dibenzanthracene, for injection into experimental animals and for tissue cultures, has long been desired. H. D. Barnes describes such a method, in which he employs lecithin, a constituent of egg-yolk, as dispersing agent.

Further analysis of the amino acids which, according to Prof. A. I. Virtanen and T. Laine, are excreted in the soil by nodules of leguminous roots, have convinced these investigators that aspartic acid, which they failed to find on a previous occasion, is a constituent of the amino acid mixture. The remainder apparently consists of lysine. The authors believe that these compounds are the primary amino acids formed in the fixation of nitrogen by leguminous plants.

According to experiments by Dr. Paul Meyer, the colloid osmotic pressure of the body fluid of marine animals shows a close relationship to their general organisation. The values obtained with serum of Teleosteans are nearly as high as those of large terrestrial mammals. The assumption of Krogh that aquatic animals should require only a low colloid osmotic pressure in the blood to prevent filtration is not confirmed by the author.

Miss Nicholson and Prof. Yonge, disagreeing with Prof. H. Graham Cannon's views as to the function of the labral glands of the fairy shrimp, *Chirocephalus*, have stated that the material described by Graham Cannon as coagulated gland secretion was in fact the regurgitated contents of the gut. Graham Cannon now answers that there are essential differences between the coagulated mass described by him and that observed under different conditions by Nicholson and Yonge.

Sound-film tracks and breath-pressure records of speech-sounds, submitted by Prof. Scripture, indicate that successive speech-sounds may overlap one another in the spoken word. This may explain how the character of a speech sound can depend upon a sound that appears later in the printed word.

The outer portions of the 'wings' accompanying the Rayleigh line in the Raman spectrum of the light scattered by certain organic liquids such as benzene have been ascribed by Gross and Vuks to the persistence of quasi-crystalline lattice oscillations, rather than to the rotation of the molecules. Dr. S. C. Sirkar points out that one may then expect the intensity of the outer portions of the wings to diminish when benzene is mixed with a liquid like cyclohexane, which has feeble 'wings'. This, however, he finds does not occur.