

Science and Mankind

IF we are to deal with the science of man, one of the first steps is to know our own position in the recurring cycles of civilization. Then we can see in what direction we are heading at present.

The cycle of economy and waste covers about 130 years. The waste began at 1535, 1660, 1790, 1920. The more austere periods revived in 1560, 1690, 1820; may we therefore look to 1950 or thereabouts? This is known in the northern saying, "from clogs to clogs in three generations".

The long general cycle of civilization in Egypt bore the best work in 3700, 2600, 1550, 450 B.C., and A.D. 760, an average of 1,115 years, resembling the

1,100 years of the "Great Year" known to the Etruscans. In each of the repetitions there was the same order of development—sculpture and architecture, painting, literature, mechanics, science, and lastly wealth, the stage we seem now to have reached. Following that, other races break in for plunder, and after some centuries of mixture a new dominant rises with a fresh cycle.

A still larger cycle is that of race. The Sumerian, the Semite, and the Perso-Aryan have successively been leaders of the East. We seem now to be nearing the end of Aryan rule, unless we can make recovery.

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Points from Foregoing Letters

THE transition temperatures of superconductive alloys are considered by Dr. H. Jones, who states that the change in the transition temperatures of superconductors when small quantities of other metals are added in solid solution arises from the change of entropy in the normal phase of the metal; the entropy of the superconductive phase being relatively little affected by the impurities.

Dr. H. London has investigated liquid helium II by means of an immersed Knudsen manometer. Instead of the repulsion which might be expected he found an attraction, which seems to indicate that the heat flow is associated with a flow of liquid.

Clusters of short-range tracks observed on photographic plates covered with paper and paraffin wax and exposed for five months at an altitude of 3,400 m. are described by Marietta Blau, who suggests that they are due to slow-moving ionizing particles arising from the disintegration of atoms in the photographic emulsion. This disintegration may be due to secondary radiation liberated in the paraffin wax by the cosmic rays.

The possibility of generating artificial auroras by powerful radio stations such as those of Cincinnati and Moscow is discussed by Prof. V. A. Bailey. A visible glow discharge near the lower part of the *E*-layer of the upper atmosphere could be produced by radiating a circularly polarized vertical beam of gyro waves at the rate of 500 kilowatts from a network antenna of 2 km. square. With one million kw. it might be possible on clear nights to provide an illumination over ten thousand square miles equivalent of that to the full moon when overhead.

Photographs of the spectra of the light emitted from the positive column in an electric discharge in wide tubes (3 cm. diameter) filled with rare gases (krypton, argon) or mercury gas are submitted by Dr. S. P. McCallum. They show that all have the same long-wave spectral limit at about 6850 Å.

Renewed and extended measurements of the Paschen continuous emission of hydrogen leads Dr. T. L. Page to admit that Kramers' law is valid for atomic hydrogen. He still considers, however, that it should not be used in calculating the absorption of the alkalis and the non-hydrogenic elements in a stellar atmosphere.

Dr. J. F. Schouten points out, contrary to Crawford's assumption, that the Lythgoe effect cannot be explained by theories based on photochemical changes alone. The close resemblance between the varying latent period and the α -adaptation strongly

supports Lythgoe's assumption that the effect is due to nervous interaction, which, moreover, must be of the inhibitive kind.

The discrepancy in the recorded values for the interfacial tension between mercury and water, which vary from 375 to 427 dynes/cm., are due, according to D. C. Henry and J. Jackson, to the effect of dissolved oxygen; this produces mercury ions which are strongly adsorbed at the interface. In vacuum or in the presence of hydrogen or nitrogen the higher value of 426–427 dynes/cm. is observed.

The dielectric polarizations of ammonia and the three methylamines have been compared at 25° in the gaseous, dissolved (benzene), and liquid conditions by Dr. R. J. W. Le Fèvre and P. Russell. For ammonia the polarization is greatest as a gas and least as a liquid, but for di- and tri-methylamines the reverse is the case. The last-named amines are therefore good examples of a less common type of behaviour referred to previously by Dr. Le Fèvre.

Dr. R. Brdička criticizes the findings of F. Bergh, O. M. Henriques and C. G. Wolffbrandt concerning the probable substances responsible for the 'polarographic' curve obtained with the serum of cancer patients. He concludes that the only active substances are cysteine or cystine, arising from the break up of serum proteins (for example, albumose).

Liberation of ammonia from nitrogenous organic compounds by ignited ferric oxide and heated red soil, under the influence of light, has been observed by G. Gopala Rao and Ch. I. Varadanam. The authors suggest that nitrification in soils may likewise be due to photochemical action.

Nicotinyl glycine alone among a number of related compounds is found by Maurice Landy to possess the same growth-promoting action upon *Staphylococcus aureus* as nicotinic acid.

A photomicrograph of the chromosome complex in a hybrid between the sugar-cane and the Indian corn is submitted by Dr. E. K. Janaki Ammal, showing that a majority of the chromosomes come from the female sugar-cane parent. The cross is a dwarf plant resembling a sugar-cane but having the characteristic epidermal hair found on the upper side of the leaf in *Zea Mays*.

Photographs of profiles of vowel sounds on sound films are submitted by Prof. E. W. Scripture. He points out that every element in a vibratory bit has its characteristic rate of fading and that the vowel vibrations are not forced vibrations and cannot have been produced by resonance.