Measurement of River Bores

WITH reference to the note in NATURE of April 25, p. 711, concerning the observations of the bore in the River Trent, may I direct attention to the observations made by the surveyors of Whangpoo Conservancy Board in February 1920 on the famous bore of the Ch'ien Tang River ? Apart from general tide readings, special water-levels were observed every ten minutes during the day and every minute for one hour before and after the passing of the bore, at six stations covering a reach of 18½ miles, for two weeks. The maximum height of the vertical face of the bore was 4½ feet, the total rise in that tide being about 16 feet.

Representative figures, diagrams and photographs are given in the publication entitled "Report on the Hydrology of the Hangchow Bay and the Ch'ien Tang Estuary". This is now out of print, but a copy was deposited in the Science Library at South Kensington.

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 May 29.

The Beams Ultracentrifuge

AN ultracentrifuge designed by Beams has been in operation in this laboratory for the past year. From information published[1,2,3,4], we assumed the forces to be of the order of 5×10^5 times gravity when driven by air at about 80 lb. pressure. On subsequent measurement we find that the maximum force developed is 4×10^6 times gravity. This is obtained at a speed of 10,000 r.p.s., which is considerably in excess of that obtained by Beams[4] with a similar rotor under the same conditions.

The figures given in cytological papers from this Department therefore require correction.

A paper on the apparatus and methods of measurement is in course of preparation.

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[1] Beams, *Rev. Sci. Inst.*, 1, 667 (1930).
[2] Beams and Weed, *Science*, 74, 44 (1931).
[3] Beams, Weed, and Pickels, *Science*, 78, 338 (1933).
[4] Beams and Pickels, *Rev. Sci. Inst.*, 6, 229 (1935).

Points from Foregoing Letters

A DESCRIPTION of a new fossil human skull from the middle gravels of the Thames 100 ft. terrace at Swanscombe, Kent, is given by A. T. Marston. Its features are those of a specialized type less advanced than the well-known Piltdown skull. The author considers that the Piltdown skull must be assumed to come from a later geological horizon than the Swanscombe skull.

Values of 206·00 and 208·00 for the mass of lead isotopes are calculated by Prof. A. J. Dempster, by comparison with palladium and rhodium, by means of the mass spectrograph. This is in agreement with the atomic masses to be expected for lead isotopes derived from the radioactive transformation of uranium (238·088) and thorium (232·070), allowing for the loss of mass due to the emission of alpha-rays (helium) and beta-rays (electrons), and also for the mass equivalent of the energy of the emitted particles.

Graphs showing the ranges of particles emitted by boron and lithium (due to the capture of slow neutrons only) at different air pressures are submitted by J. Rotblat. Taking into account the most probable values of the masses of the particles involved in the transformation, the author finds in the case of lithium good agreement with the total energy calculated ($4·5 \times 10^6$ e.v.). In the case of boron good agreement is obtained if the velocity-range calculated from the theories of Bethe and of Bloch is substituted for the experimental velocity-range relation given by Blackett and Lees. The boron curve indicates that there is an additional release of energy from boron, probably in the form of gamma-rays.

When a fast electron beam is diffracted by an etched surface of a single crystal of copper, Dr. W. Cochrane finds, in addition to the cross-grating pattern, also the 'Kikuchi' light and dark line pattern, which indicates a high degree of perfection in the crystal.

Data indicating the growth-promoting action of glycolic, pyruvic and glyoxylic acids upon the mould, *Aspergillus niger*, are given by N. Nielsen and V. Hartelius, in continuation of their investigation on the nature of the growth substance produced when cane sugar is inverted by means of acids.

Dr. H. G. K. Westenbrink shows that fundamentally the same ratio holds for the velocities of intestinal absorption of certain sugars (d-galactose, d-glucose, d-fructose, d-mannose, l-xylose and l-arabinose) with the rat and the pigeon. With both rat and pigeon there is a distinct difference between the velocities of absorption of l-xylose and l-arabinose.

Dr. S. L. Frolova describes and illustrates spontaneous aberrations of the chromosomes in mass cultures of several species of the fruit-fly, *Drosophila*. Of six changes observed, three were inversions in the autosomes of *Drosophila repleta* and *D. sulcata* and the other three consisted of a deficiency in an autosome of *D. lugubrina* and two inversions in the X-chromosome of *D. sulcata*.

A table summarizing the values of the dissociation energies of the sulphur, selenium and tellurium molecules, as deduced from both spectroscopic and thermochemical observations, is given by P. Goldfinger, W. Jeunehomme and B. Rosen. The authors state that a determination of the heat of combustion of the recently isolated sulphur monoxide would enable a choice to be made between the alternate values deduced from spectroscopic data.

A. Akhieser, L. Landau and I. Pomeranchook have calculated the cross-section for the scattering of light quanta by light quanta for the case of large frequencies.