

Newcomb had, however, suggested many years before the possibility that the lunar fluctuation might arise from changes in the earth's rate of rotation.

Prof. de Sitter stated that his work had been assisted by excellent series of photographs of the satellites obtained at many observatories. He made a comparison between the accuracy of heliometer and photographic positions; the probable error of one position with the former was 0.075", while that from a plate with six images, measured in two positions, was 0.02"-0.03".

Weather and Health.

AN interesting report, prepared by Dr. Ellsworth Huntington with the advice of a strong committee, based on the daily meteorological and mortality records of the city of New York from April 15, 1882, to Mar. 24, 1888, appears as *Bulletin No. 75* of the National Research Council (National Academy of Sciences, Washington). Gross mortalities at ages under five years and over five years are considered separately, also mortalities in these age periods from causes other than pneumonia and influenza. Mortality from pneumonia and influenza (all ages) forms a separate group. The data are expressed as percentages of the daily average of the particular year, and, when necessary, corrections for seasonal trend are introduced. For sufficient reasons, graphical methods are chiefly used, in particular climographs: that is, a third variable, daily deaths, is shown by contour lines on a bivariate diagram, for example, of temperature and relative humidity. It is contended that the method leads to clearer results than the use of correlation coefficients and massed averages.

The principal conclusions reached are these. Judging by the data of deaths from all causes except pneumonia and influenza among persons over five years of age, the optimum temperature is close to 65° F. Among children under five years the optimum is about 10° lower. Among extremely young infants, however, there is evidence that the optimum is higher. So far as influenza and pneumonia are concerned, it appears that the chances of contracting the disease are at a maximum with the lowest and a minimum with the highest temperatures, but that the chances of death after the disease has been acquired are subject to the influence of the normal temperature optimum. It appears that at the optimum temperatures, low atmospheric humidity is harmful but, among young children, plays only a minor part. Above the optimum temperature, the best humidity appears to be progressively lower as the temperature rises.

Much stress is put upon the relation between inter-diurnal variability of temperature and mortality. "No matter whether a drop of temperature causes the mean temperature to be better or worse, it tends to produce a stimulating effect which induces a relatively low death-rate both on the day in question and the next day. In similar fashion, no matter whether a rise of temperature brings a favourable or unfavourable mean temperature, its effect for two days is to raise the death-rate." Still more interesting is the apparent fact that a moderately high degree of variability of temperature from day to day is more favourable than low variability. In this respect there is a similarity between the experience of New York and of Stockholm, which suggests that there is a definite optimum variability independent of temperature.

The author asks whether "the apparent difference from season to season" may not "merely represent

the fact that in cold weather we are protected from changes of temperature". He finds that ideal weather in New York would be characterised by an average temperature of about 65° and a relative humidity of nearly 90 per cent. The preceding ten days should have been characterised by fairly strong changes of temperature, averaging 4°, and should culminate in a fall of 10° or 12°. It seems that south-east England, outside the smoke-laden area of London, approaches as near to the ideal as we may hope to come, but the author points out that many other variables remain to be considered.

University and Educational Intelligence.

CAMBRIDGE.—The Sadleirian professorship of pure mathematics will be vacant on Sept. 30, 1931, by the resignation of Dr. E. W. Hobson.

The Appointments Committee of the faculty of mathematics has reappointed Mr. S. W. P. Steen, of Christ's College, and Mr. T. G. Room, of St. John's College, to be University lecturers in the faculty, and Mr. E. C. Bullard, of Clare College, to be University demonstrator in geodesy.

A report has been received from the managers on the regulations for the Quick professorship of biology. In October, Prof. G. H. F. Nuttall retires from the chair, after having held it for twenty-five years. By the terms of Mr. Quick's will, the benefaction must always be used to promote "study and research in the sciences of vegetable and animal biology". Authority is given to the managers, however, to propose to the University changes in the particular field of biology with which the chair shall be associated. From 1906 until 1919 this field was defined as protozoology; in 1919 parasitology replaced protozoology. The managers now recommend to the University that the next tenure of the Quick professorship should be associated with the field of research which they define as the study of the "Biology of the Cell". If this recommendation is approved, they intend to offer the chair to Mr. D. Keilin, who has for some years been carrying on research work of this type in the Molteno Institute.

The University has conferred the honorary degree of M.A. on Mr. E. Everett, on his retirement, after more than forty years' service, from the post of assistant to Sir J. J. Thomson at the Cavendish Laboratory.

DURHAM.—The Council of Armstrong College has appointed Dr. E. G. Richardson to be lecturer in physics. Dr. Richardson is at present lecturer in physics at University College, London, and is engaged on research in connexion with the propagation of high frequency radiation in gases.

LONDON.—The London School of Economics and Political Science has been granted the sum of £142,000 by the Rockefeller Foundation. This sum has been allocated as follows: £60,000 for reconstructing and extending the library; £10,000 for the purchase of additional books; £30,000 towards the purchase of land for new school buildings; and £42,000, in annual grants of £6000, for providing increased facilities for post-graduate teaching and research.

The late Mr. Clifford B. Edgar has bequeathed £4000 to the London School of Hygiene and Tropical Medicine for the promotion of research. Mr. Edgar was a graduate of the University, and intimately connected with its work for many years, having acted as chairman of the Finance Committee from 1910 until 1920.

The Court of Common Council has renewed for 1931

its grant of £105 in aid of the University's extension work, and the Drapers' Company has renewed for the year 1932 its grant of £500 for the Department of Applied Statistics at University College. The Civil Service Commission has notified the University of the renewal for 1931-32 of the present subvention of £2250 from Indian revenues towards the cost of probationary instruction of selected candidates for the Indian Civil Service.

OXFORD.—At Rhodes House, on May 9, Prof. A. Einstein delivered in German the first of his three Rhodes Lectures on "The Theory of Relativity—its Formal Content and Present Problems". He gave a general exposition of the special and general theories of relativity, emphasising the need of "logically satisfying" assumptions and explaining the methods of advance from the Euclidean to a pseudo-Euclidean metric and hence to the Riemann metric. The general theory could not, however, provide a logical explanation of the electromagnetic field. In his second lecture, on May 16, Prof. Einstein will discuss the problem of the finite universe. In his last lecture, on May 23, he proposes to give an account of his attempt to derive both the gravitational and electromagnetic fields by the introduction of a directional spatial structure.

The following courses of free public lectures in metallurgy have been arranged by the Armourers and Brasiers' Company:—At 8 o'clock on May 21 and 28 and June 4, at the Royal School of Mines, "Thin Films on Metals", by U. R. Evans, and at 5.30 on May 27 and June 3 and 10, at King's College, Strand, "Some Impurities in Metals and the Production of Metals of High Purity", by Dr. W. Rosenhain. No tickets are required.

Birthdays and Research Centres.

May 18, 1873.—Dr. H. ELTRINGHAM, F.R.S., president of the Entomological Society of London (1931).

Is more or less continuously engaged in the histological structure of insects, more especially that of special glands and organs. At present investigating the structure of the abdominal organs in the smaller caddis flies, the action of 'diaphanol' on chitinous and other structures, and the structure of the eye in Aleurodes.

At all times prepared to undertake histological investigations into the finer structure of insects, and should be glad to have unusual material for this purpose from anyone who has the opportunity of obtaining same in a proper state of preservation. Would be glad to furnish suitable preservative fluids to anyone who can obtain material suitable for investigations of this character.

May 19, 1876.—Prof. W. K. GREGORY, curator of the Department of Ichthyology, American Museum of Natural History.

My chief investigation now in progress is the study of the skulls of fish of many orders and families. Each skull is considered from two points of view: first, as a natural mechanism (the inert part of a machine that serves in the complex turnover of energy taken in and paid out by the organism as a whole); secondly, as a morphological pattern, which has acquired its various characters at different stages of its phylogenetic history.

I should welcome researches bearing upon the hypotheses that triradiate sutures arise through the equal growth away from each other of three centres

of ossification and that the semicircular canals arose in a similar manner. A functional analysis of parts of the neurocranium (cranial vault, interorbital bridge, ethmo-vomer block, keel-bone or parasphenoid) leads to interesting results.

May 23, 1850.—Dr. G. C. DRUCE, F.R.S., Fielding curator in the University of Oxford.

I am at present engaged in an investigation of the flora of Cyprus.

May 23, 1864.—Sir ARTHUR SMITH WOODWARD, F.R.S., lately Keeper of the Department of Geology, British Museum (Natural History).

I have accumulated many fossil fishes on which I hope soon to continue research, but I have been occupied for a long time in preparing (and largely re-writing) a second English edition of Zittel's "Palaeontology", vol. 2 (Fishes, Amphibians, Reptiles, and Birds), which is now in type and nearly completed. A new edition of my "Outlines of Vertebrate Palaeontology" will probably follow. I think that one who has had long experience of any sphere of research can do good service to science by attempting, from time to time, to digest and correlate the results of the multitude of technical papers and memoirs which now appear in more rapid succession than ever.

Societies and Academies.

LONDON.

Royal Society, April 30.¹—J. A. Todd: On twisted cubic curves which satisfy twelve conditions. The paper deals with the problem of determining the number of twisted cubic curves in space which satisfy the joint condition of meeting r lines in one point, s lines in two points, and of passing through t fixed points where $r + s + 2t = 12$, so that the condition determines a finite number of curves. The simpler cases are treated by a variety of elementary methods; for the more complicated cases the principle of special position is employed, in which the given lines and points are made to assume particular positions in such a manner that the curves which are required fall into various classes, of which the number of curves in each is determined by simpler considerations.—H. T. Flint: A metrical theory and its relation to the charges and masses of the electron and proton. This paper points out the analogy existing between the equations of the quantum theory and the electromagnetic equations of Maxwell, pointing to the existence of a definite natural metric in a five-dimensional continuum. Parallel displacements along the world lines in this continuum are associated with no change in length, but in the four-dimensional world the change of length is a periodic function, with a frequency proportional to the mass associated with the world line. This view leads at once to the interpretation of the ratio of the masses of the electron proton as a metrical ratio, and makes a unitary physical theory possible.—A. M. Mosharrafa: Material and radiational waves. The Maxwellian equations of electromagnetic and electron theory are derived from one set of basic relations in a manner which throws some light on the relationship between material and radiational waves, and accounts for the existence of exactly three types of physical entities, namely: positive electricity, negative electricity, and radiation. It is shown that a physical entity may be associated with the propagation of a vector A in a direction n . If A and n are in the same direction, the entity is recognised

¹ Continued from p. 726.