

Much light can be thrown on the problem of immunity by a study of the resistance of plants to non-living poisons and alkalis. Dr. Winifred E. Brenchley considered the effect of excess mineral nutrients, of inorganic and organic poisons, of gases and sprays, and in the section on resistance to alkalis reviewed much recent work on the plants of chalky soil, and on chlorosis. Prof. F. T. Brooks discussed the resistance of trees to ligneous fungi, and Dr. Tewfik Fahmy described the production of cotton plants immune to the fungus *Fusarium vasinfectum* var. *Egypticum*, by breeding and selection.

Prof. L. W. Rischkow reviewed the conditions where resistance of the host was shown towards virus diseases, and Dr. R. N. Salaman dealt with the same subject, but from a different point of view. He showed that a plant could be rendered immune from attack by a virulent form of virus 'X', if it were previously vaccinated with a non-virulent strain of the same virus. Dr. Kenneth Smith and Mr. J. P. Doncaster had a paper on "The Particle Size of Plant Viruses".

Immunity against bacterial plant pathogens was treated in an encyclopædic manner by Prof. Tr. Săvulescu, who claimed that the use of vaccines or bacteriophage, in plant therapy, is understood in theory, but is not yet of practical utility. A very extensive bibliography appears at the end of Prof. Săvulescu's paper. Two very informative papers on "The Nature of Resistance of Cereals to Rust", by Dr. E. C. Stakman and Miss Helen Hart, and "The Development of Disease-Resistant Plants", by Dr. H. B. Humphrey, end the volume.

The teacher of mycology, and those plant pathologists who were not fortunate enough to attend the Congress, cannot but be grateful for this volume of reports. It is a welcome gathering of knowledge from many, and often conflicting, points of view, which do not appear so conflicting when tempered by the international atmosphere of the conference, and when bound within the confines of one volume. With the exception of one paper in Italian, all the communications are in English, French or German, and with the provision of a French summary to each article, the contents will be available to most students.

Science News a Century Ago

Prof. Edward Turner (1798-1837)

ON February 13, 1837, Prof. Edward Turner died at Hampstead at the age of thirty-nine years through inflammation of the lungs. He had been appointed professor of chemistry at University College, London, in 1828, and his death was regarded as a severe loss not only to the College, but also to many scientific societies in the Empire. Born in Jamaica in 1798, he was taken to Edinburgh at an early age and was educated there, graduating M.D. in 1819. After a period of study under Stromeyer at Göttingen, he began to lecture in Edinburgh and published his "Introduction to the Study and Laws of Chemical Combination", which he afterwards worked into his "Elements of Chemistry", 1827, one of the standard text-books of the time.

At University College, Turner had a large class and his lectures were remarkable for their lucidity. Speaking of his work to the Chemical Society in 1900, Sir Edward Thorpe said he was "an excellent

manipulator and his analytical and determination work was of a high order. He is specially to be remembered for his determination of the atomic weights of lead, chlorine, silver, barium, mercury, nitrogen and sulphur; they were the first atomic weights to be measured by a British chemist and are worthy to be ranked with those of Berzelius". In the course of his work, Turner pointed out that the atomic weights hitherto commonly used by British chemists had been adopted without due inquiry and that several of the most important ones were erroneous, and that the hypothesis that all equivalents are multiples of a whole number of the equivalent of hydrogen was inconsistent with the state of chemical knowledge at the time, being at variance with experiment. His work led to the rejection of Prout's theory, and the position he arrived at was precisely that to which Stas arrived half a century later."

Turner was buried in Kensal Green Cemetery. A marble bust of him was placed in University College by his pupils. He was succeeded by Thomas Graham.

Claude-Pierre Molard (1758-1837)

BY the death on February 13, 1837, of Claude-Pierre Molard, the French nation lost a distinguished mechanician who had been one of the most active founders of the National Conservatoire des Arts et Métiers in Paris and its director from 1801 until 1816. When he died, he was president of the Section of Mechanics of the Paris Academy of Sciences. Molard was the elder brother of another well-known mechanician, Emmanuel-François Molard (died 1829), and was born near St. Claude, Jura, on June 6, 1758. Though the son of poor parents he was able to attend schools at St. Claude and Lyons and became a draughtsman, his ability as such attracting the attention of Jacques de Vaucanson (1709-82), who had formed a collection of machines which he left to the nation, and which eventually formed the nucleus of the collections at the Conservatoire.

In 1785, Molard went to Paris to work under Vandermonde, who was in charge of Vaucanson's collections, and he was made a member of the commission appointed by a decree of February 11, 1794, to report on the preservation of monuments and works of art. To this commission belonged Lamarck, Berthollet, Vauquelin, Monge, Prony and other men of science, and it was through them the decree of 19 vendémiaire an III. (October 10, 1794) was passed which led to the foundation of the Conservatoire.

Skey on Muscular Fibre

At a meeting of the Royal Society on February 16, 1837, a paper was read by Frederic Skey entitled "On the Elementary Structure of Muscular Fibre of Animal and Organic Life". The author, said the report, concludes from his microscopic examination of the structures of muscular fibres that those subservient to the functions of animal life have, in man, an average diameter of one 400th of an inch, and are surrounded by transverse circular striæ varying in thickness and in the number contained in a given space. Each of these muscular fibres is divisible into bands or fibrillæ, each of which again is subdivisible into about one hundred tubular filaments, arranged parallel to one another, in a longitudinal direction around the axis of the tubular fibre which they compose, and which contains in its centre a soluble

gluten. The diameter of each filament is one 16,000th of an inch.

Frederic Carpenter Skey (1798–1872) was a pupil of Abernethy and became successively assistant-surgeon, lecturer on anatomy and surgeon at St. Bartholomew's Hospital. He was elected F.R.S. in 1837 and in 1863 served as president of the Royal College of Surgeons.

Royal College of Surgeons

THE *London Medical Gazette* of February 18 contains the following eulogy of the Royal College of Surgeons:

"Of the existing institutions connected with the medical profession the College of Surgeons is in various respects by far the most important. The building is worthy of the great national establishment; the library is a magnificent addition, which has grown up of late years; the museum is a monument worthy of the name it bears, and creditable to the nation. Nor do the names of many among its present members reflect less honour upon English surgery than the greatest of their predecessors, while of the existing Council it is but justice to add that they have shown their determination to keep pace with the march of intellect and the improvement of the times. In these respects—we mean setting aside ancient prejudices—in gathering wisdom from passing events—and in rendering their institution available to great national objects—we must say they have far outstript their elder brethren in Pall Mall, and accordingly are their character and influence as a public body proportionately greater. It is in Lincoln's Inn Fields that the battle between the new and the old race of practitioners must be fought. . . ."

University Events

CAMBRIDGE.—Prof. J. Proudman will give a course of six lectures on dynamical oceanography in the Zoological Lecture Theatre at 5 p.m. on Mondays, Wednesdays and Fridays, commencing on Monday, February 15.

The following have been approved for the degree of Sc.D.: D. A. Bannerman, of Pembroke College, and E. A. Guggenheim, of Gonville and Caius College. Miss Frances Mary Hamer, of Girton College, has been approved for the title of the degree of Sc.D.

EDINBURGH.—The Cameron Prize for 1937 has been awarded by the Senatus to Prof. J. Bertram Collip, professor of biochemistry in McGill University, Montreal, in recognition of his many contributions to endocrine therapy and in particular his work on the parathyroid gland.

At a meeting of the University Court on January 25, an offer was received from the University Grants Committee of a non-recurrent capital grant up to a maximum of £15,000 towards the cost of a building for a Students' Union for men and women on the King's Building site at West Mains Road, the building to include a refectory and a gymnasium. The total cost, exclusive of furnishings, is estimated at £20,000, and the Committee has offered the grant on condition that the remainder of the cost be obtained from other sources, and that the scheme should be proceeded with as soon as possible, and in any case within two years from the date of the offer.

Societies and Academies

London

Royal Society, February 4.

R. A. WATSON WATT, A. F. WILKINS and E. G. BOWEN: The return of radio waves from the middle atmosphere. Observations spread over a year from May 1935 have established the existence of sustained stratified electrification, persisting for several days, of such ionization density and gradient as to return radio waves of frequency 6–12 Mc./sec. at vertical incidence, at such heights as 8.5, 9.3, 10.3, 10.75 and 13.5 km. with reflection coefficients of the order of 0.7, giving measurable echoes up to the tenth order, beyond which they are not readily distinguished from ionospheric echoes. Apparently independent stratification at 45–50 km., with a reflection coefficient of 0.3 for 6 Mc./sec. waves, and the *D* region at and above 60 km. are also recorded. Reflections from all these regions are obtained at and above the frequencies proposed for television services. The ionization does not fall to very low values at night, and has no seasonal variation of large amplitude. Evidence is given of replenishment around the 20–30 km. levels by local thunderstorms.

H. J. BHABHA and W. HEITLER: The passage of fast electrons and the theory of cosmic showers. Relativistic quantum mechanics have been used to calculate the number of secondary positive and negative electrons produced by a fast primary electron with energy E_0 passing through a layer of matter of thickness l . The primary electron in the field of a nucleus has a large probability of emitting a hard light quantum which creates a pair. The pair electrons emit again light quanta which create pairs, and so on. The number of secondaries increases rapidly with E_0 . If an electron of 10^{11} e-volts passes through a lead plate of 5 cm. thickness the number of particles emerging from the plate amounts to 1,000 or more. Thus showers can be explained by the ordinary quantum theory. Comparison with experiments shows that Rossi's transition curve and Regener's absorption curve in the atmosphere can be understood on this theory. The penetrating power of fast electrons appears to be very much greater than a straightforward consideration of the energy loss would indicate. The absorption coefficient of the radiation found at a depth of 100 metres of water cannot, however, be understood on the basis of this theory if this radiation is due to primary electrons.

Paris

Academy of Sciences, January 11 (*C.R.*, 204, 77–160).

MARCEL GODCHOT and MILLE GERMAINE CAUQUIL: The action of hydrocyanic acid on 4-methylcyclohexanone and the preparation of the two stereoisomeric 4-methylhexanol carboxylic acids.

PAUL LÉVY: The arithmetic of the laws of probability.

MARC COURTAND: *Gauche* curves of the third order.

PAUL VINCENSINI: Bodies of constant width in space of three dimensions.

ANDRÉ MARCHAUD: The contingent and paratangent at a point of a simple Jordan surface.

MICHEL GHERMANESCU: Homofocal quadrics.

LOUIS THIBAUDIER: The Poncelet polygons inscribed and circumscribed in two conics.