defects; but other even isotopes (mercury-202) have recently been separated[14], as a more abundant supply, and krypton-84 has been used for similar purposes[15].

Medical applications. The high cost of separation makes stable isotopes too expensive an item for most medical experiments; one application, however, is a promising exception. Natural iron (iron-54, 56, 57 and 58), when irradiated in a pile, produces radioactive iron-55 and 59. Iron-59 has a half-life (46 days) which makes it suitable as a tracer in experiments with human beings; iron-55, while satisfactory for general biological experiments, has a half-life (four years) which makes it a hazard in experiments on humans. Attempts to obtain iron-59 from pile-irradiated cobalt have proved difficult, owing to the high concentration of cobalt-60. If, however, one forms a 'source' of iron-58, from which the exclusion of iron-54 by electromagnetic separation is easy, then the iron-59 produced by pile irradiation can be extracted by a Szilard–Chalmers process, and the bulk of the iron-58, by repeated irradiation, is eventually converted to iron-59. In this way an adequate supply of suitable radioactive iron is made possible.

Superconductivity. Isotopic effects are usually confined to nuclear interactions, but a recent discovery by Serin, Reynolds and Nesbitt[16] has shown a variation in the superconductive transition temperature of mercury with variation in mean isotopic mass. This effect has been confirmed in Britain and in America[17] by using the separated isotopes of tin, and the theoretical prediction, $T \times m^{1/2} =$ constant, has been approximately confirmed. The British results suggest that possibly the exponent of the mass factor is slightly less than $\frac{1}{2}$.

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OBITUARIES

Dr. Yoshio Nishina

THE death occurred on January 10, at the age of sixty, of Dr. Yoshio Nishina, president of the Scientific Research Institute, Ltd. By his death, the Japanese scientific world lost an eminent leader.

Dr. Nishina was born on December 6, 1890. Graduating from Tokyo Imperial University in 1918, he entered the Institute of Physical and Chemical Research. In 1921 he went to Europe to study at the Cavendish Laboratory, Cambridge, under Lord Rutherford, then at the University of Göttingen, and later at Copenhagen under Prof. N. Bohr. While working in Copenhagen during 1923–27, he published several important papers, such as "Study on *L*-series X-ray Absorption Spectra of the Elements from Sn to W", "Study on the Effect of Chemical Combination upon X-ray Spectra", and "Study on Quantitative Chemical Analysis by X-ray Spectroscopic Method". Collaborating with Dr. O. Klein, he calculated the scattering cross-section of hard X-rays by a free electron and deduced the well-known Klein–Nishina formula in 1928. In November 1928, he returned to the Institute of Physical and Chemical Research by way of the United States and initiated the pioneer work in the fields of cosmic rays and nuclear physics in Japan.

In 1937 Nishina constructed a 27-in. cyclotron to pursue nuclear research. One of his investigations in this field was to assign the elements ruthenium, rhodium, palladium, silver, cadmium, indium, tin and antimony to fission products of uranium and thorium. He showed that uranium-237 is produced from uranium-238 and uranium Y from thorium-232 by the $(n, 2n)$ reaction. The mechanism of metabolism of plants and animals was studied, using radiosodium and radiophosphorus as tracer. In 1944 a 60-in. cyclotron was constructed by which 18-MeV. deuterons could be produced. Nishina flew to Hiroshima and Nagasaki to investigate the effects of the atomic bombs just after the explosion in 1945.

He was also interested in cosmic ray research. He measured the intensity of cosmic rays in 1944 in the Shimizu Tunnel at a depth equivalent to 1,400 m. of water. The continuous measurement of cosmic ray intensity which is still being carried on was started by him in 1935.

Theoretical physics in Japan also owes much to his leadership.

Dr. Nishina was appointed as the first president when the Institute of Physical and Chemical Research was reorganized as the Science Research Institute, Ltd., in 1948. In 1949 and 1950 he visited Copenhagen and the United States as a representative of the Japan Science Council. As president of the Scientific Research Institute, Ltd., as vice-president of the Japan Science Council and as president of the Japan Federation of Unesco Cooperative Associations, his activities were many and varied.

His death is a great loss not only for the rehabilitation of science and technology in Japan but also for her progress in general. KENJIRO KIMURA

Sir Frank Lindley, C.B.

SIR FRANK LINDLEY, who died at Ditchling on August 15 at the age of seventy, spent practically the whole of his working life in the service of the Patent Office, of which he was comptroller-general from December 1932 to September 1944.

He was educated at Brighton Science School and graduated with an honours degree in physics at University College, London. After entering the Patent Office in 1903 he studied law and also found time to take part in student activities at Birkbeck College. When reading for the Bar he was elected Barstow Law Scholar, took a University scholarship in the LL.B. examination, and became a King Edward VII research scholar of the Middle Temple He became a senior examiner in the Patent Office in 1922, transferred to the Trade Marks side as assistant comptroller in 1926, and succeeded Sir William Jarratt as Comptroller-General of Patents, Designs, and Trade Marks in 1932.

The earlier period of Sir Frank's comptrollership was dominated by the dual tasks of administering the recently passed Patents Act of 1932, which

extended the official search for novelty of inventions to general literature, and taking a very active part in the reform of the Trade Marks law which resulted in the passing of the Trade Marks Act of 1938. The later period was dominated by administration of the Patent Office in war-time when, in spite of bomb and fire damage and much devastation, the work of the Office was carried on continuously. During this period he worked unsparingly at settling the terms of licences for working enemy-owned patents and copyrights, and in dealing with emergency legislation in all branches of Patent Office work. After retiring from the Patent Office he acted for two years as scientific adviser to the Appointments Department of the Ministry of Labour and National Service, in spite of failing health. He endured the progress of Parkinson's disease with conspicuous courage and was bravely upheld by Lady Lindley, whom he first met at Birkbeck College and who survives him with a son and daughter.

NEWS and VIEWS

Dr. Elizabeth A. Fraser

WITH the departure of Dr. E. A. Fraser, the Department of Zoology at University College, London, loses its member of the longest standing. When she joined the Department as a student in 1905 it was headed by E. A. Minchin; but it was under his successor J. P. Hill that she began those original studies in vertebrate development which have been her chief scientific interest ever since. This work has, among other things, contributed much to our understanding of the evolutionary morphology of the excretory organ of the vertebrates, and has provided the basis of our knowledge of the segmental structures of the marsupial head. All her work shows the accuracy and care in minute observation that is an important part of the heritage of classical embryology. With this she combines an appreciation at once sympathetic and critical of the schools of experimental morphology that has served as an admirable stimulus to her many students. Past students of the Department have, indeed, much to thank her for. Whether as assistant, senior lecturer, reader, acting head of the Department (during its war-time evacuation), or since the War as an honorary research associate, she has followed their progress with helpful interest and has never spared herself in their service.

John Kidd, F.R.S. (1775–1851)

JOHN KIDD, who died a century ago on September 17, 1851, studied medicine at Guy's Hospital, London, and in 1801, after graduating, was appointed reader in chemistry in the University of Oxford. He held the Aldrichian professorship of chemistry from 1803 until 1822, when, through the influence of his former teacher, Sir Astley Cooper, he became regius professor of medicine. He was also physician to the Radcliffe Infirmary and, though he had a large private practice, found time for chemical, geological and mineralogical pursuits. He published "The Outlines of Mineralogy" in 1809 and enriched the Ashmolean Museum's collection of geological specimens. A Fellow of the Royal Society, Kidd's contributions to the *Philosophical Transactions* included an "Essay on the Spontaneous Production of Saltpetre" (1815) and a paper on "The Anatomy of the Mole-cricket" (1825). Elected keeper of the Radcliffe Library in 1834, he supervised the compilation of the section on medicine and natural history of its catalogue. His Bridgewater treatise "On the Adaptation of External Nature to the Physical Condition of Man" (1837) reached its sixth edition in 1852. Kidd's dislike of ostentation led him to abandon the wig, large hat and gold-headed cane, beloved of his medical colleagues at that time.

Nuffield Foundation Grant for Research at King's College, London

IT is announced by the University of London that the Court of the University has accepted a grant of £10,000 from the Nuffield Foundation for research in biophysics in King's College under the direction of Prof. J. T. Randall, Wheatstone professor of physics. The grant is available over a period of three years and makes provision for a number of fellowships. The present work of the Laboratory, already supported by the Medical Research Council and the Rockefeller Foundation, is to be extended so as to develop the use of electronic devices in conjunction with ultra-violet and infra-red radiations in the study of cells and the structure of biologically important molecules.

Laboratoires: Bilingual Review of French Technology

A NEW quarterly review in French and English, *Laboratoires* (No. 1, April–June, 1951; pp. 56; Paris: Laboratoires, 11 rue Tronchet; 400 francs or 1500 francs a year), is devoted to French scientific instruments and technical developments. As Prof. G. Yvon explains in the foreword, the aim of the review is to present an accurate picture of research and technical activities in France to-day, and in this way to enable the world to appreciate more fully the work done by French men of science, technologists and industrialists. The first number contains seven articles by leading French scientific workers and technologists. The first, by L. de Broglie, is a discussion of the position of science in general culture, and this is followed by a description by L. Binet of two series of experiments which serve to illustrate the importance of the use of fish in the study of antitoxins. A condensed version of the first part, dealing with precision in metallurgy, of P. Chevenard's important address on January 15 to the members of the Société des Ingénieurs civils de France is given in the third article. "The Engineer and Technical Research" is discussed by M. Roy, a leading French aeronautical authority; and in an illustrated paper on French optics, by P. Fleury, director of the Institut d'Optique, Paris, the development of optical science and of the optical industry in France is outlined. Finally, the number concludes with two interesting articles: one on the influence of the electrical and electronic industries on the evolution of scientific research, by M. Ponte, director-general of the Compagnie Général de T.S.F.; and the other on calculating machines and human thought, by V. Zelbstein, president of the French association of electronic engineers, in which he maintains that many of the ideas involved in cybernetics date back to Descartes, Pascal and