

The efficiency for detecting radium in this counter was determined by counting Dr. Wright Langham ('W. L.') holding a 0.2- μ C. standard radium source against his stomach, so that the source was entirely shielded by his body as he sat in the insert. The net counting-rate was 1,133 sec.⁻¹, yielding an efficiency of 15 per cent. The statistical fluctuations in the background (± 6 sec.⁻¹) correspond to an uncertainty in the total radium of 10^{-9} C. The precision with which it is possible to determine the radium content appears to be limited by the uncertainty in the amount of other radioactive substances present in the body, and by the uncertainty in the degree of elimination of radon, which upsets the radioactive equilibrium of the subsequent daughter products. Most of the gamma-rays detected probably come from radium. It is interesting that, although one of the subjects ('P. H.') has worked for many years with radium, thorium and mesothorium, his radium content appears to be not greater than about 0.01 μ C.

Conclusions. In view of the foregoing, it is possible with a counter of this design to determine the total radium content of the body at levels well below the present set tolerance (0.1 μ C.), and to make similar determinations for any source giving sufficiently energetic γ -rays. In the absence of the radium group, the potassium content of the body can be measured with good accuracy, and it is quite conceivable that application of these techniques could yield important results in the study of the role of potassium in the metabolic process. These measurements can be made in short times *in vivo* with little inconvenience to the subject.

Since this counter was not designed specifically for the purpose of the present experiment, it should be possible to simplify and improve the system for this type of measurement. For example, the ten-channel analyser could be replaced by a single-channel analyser, or perhaps merely a scaler with a discriminator. Where good energy resolution is not an important factor, it would probably be possible to use many fewer photomultiplier tubes without serious loss of counting-rate. The size of the detector could be increased considerably to accommodate the subjects more comfortably. If smaller animals are to be counted, the counter size and number of tubes could be reduced. Such a counter is being built at this laboratory for studies on dogs.

The background due to cosmic rays was by no means negligible, and would be reduced materially either by additional shielding or by going to sea-level from the altitude of 7,300 ft. at which these experiments were carried out.

It might be possible to reduce background further without seriously impairing the efficiency of detection for the radiation of interest by a more judicious choice of the energy gates.

The superiority of the counter described here over Geiger counters is marked by its high efficiency, energy discrimination for γ -rays, and relatively large volume.

This work was done under the auspices of the United States Atomic Energy Commission. Our thanks are due to Dr. Wright Langham for stimulating conversations and for his generous support.

[May 20.]

¹ Cowan, jun., C. L., Reines, F., Harrison, F. B., Anderson, E. C., and Hayes, F. N., *Phys. Rev.*, **90**, 493 (1953).

² Nat. Bur. Stand. Circ. No. 499 (Sept. 1950).

³ Shohl, Alfred T., "Mineral Metabolism" (Reinhold Pub. Corp., New York, 1939).

OBITUARIES

Prof. H. E. Fierz-David

SCIENCE in Switzerland has sustained a great loss in the death on August 25, at Zurich, of Prof. Hans Eduard Fierz-David. Born at Zurich on January 5, 1882, Fierz-David began his education in his native city, eventually specializing in chemistry and prosecuting further studies in London and Munich. In the earlier part of his career he obtained a varied experience of applied chemistry, in particular with the International Nickel Company, also in brewing chemistry, and somewhat later with the firm of J. R. Geigy at Basle. Eventually he developed a special interest in synthetic dyes and the technology of dyes, dyeing processes, and textile fibres. Thus, in 1917 he was appointed to the chair of organic chemical technology, in the Eidgenössische Technische Hochschule, Zurich—a post which he filled with distinction over a long period, until his retirement as emeritus professor. His field of work is reflected in a series of standard publications, including "Grundlegende Operationen der Farbenchemie", "Künstliche organische Farbstoffe", "Fortschritte der Teerfarben und verwandter Industriezweige", and (with E. Merian) "Abriss der chemischen Technologie der Textilfasern".

A cultured man of wide interests, Fierz-David had an international outlook. He was a good linguist, and he cherished the humanistic aspect of his science. This last feature of his character found effective expression in the elegant historical study of alchemy and chemistry which he published at Basle in 1945 under the title, "Die Entwicklungsgeschichte der Chemie". Significantly, he dedicated this book to his friend, C. G. Jung; for among his varied interests he was a member of the Psychological Club of Zurich. Although an apostle of progress in chemistry and its applications, he deplored the methods of 'mass-production' and the intense specialization to which students are subjected in many modern teaching laboratories. Moreover, he recognized the enormous importance of a human relationship between teachers and students. Looking back to his own student-days, in a letter written a few years ago, he crystallized his feelings for a past order of things into a single sentence: "In this age, one has forgotten how to live".

JOHN READ

Mr. W. N. Croft

WILLIAM NOBLE CROFT, who died on July 10 in his thirty-eighth year, joined the Geological Department of the British Museum (Natural History) as palaeobotanist early in 1939, and almost at once set off on a British-Swedish-Norwegian Expedition to Spitsbergen, mainly to investigate Devonian fossils, reaching England again just after the Second World War broke out. Before joining the Royal Engineers, Croft completed a paper on a Lower Devonian flora of the Welsh borderland, though his stratigraphical work on this area is still unpublished. Immediately on leaving the army, he went to the Antarctic for a year as geologist and palaeontologist to the Falkland Islands Dependencies Survey; some of the results of this work have recently been published in the Survey's "Scientific Reports". In palaeobotany, Croft's main interest centred on Devonian plants; last year he published an account of some Devonian charophytes known as trochiliscs, and he had almost completed a paper on blue-green algæ from the Rhynie chert. He was an accomplished technician,

and his room was full of strange gadgets of his own devising, including a sewing-machine converted into a microscope and a bacon-slicer adapted to rock-cutting. The Croft parallel grinding apparatus is in use in many palaeontological laboratories. His colleagues will greatly miss not only his judgment and his insistence on the highest standards in everything he touched, but also his singularly attractive charm of manner.

W. N. EDWARDS

WE regret to announce the following deaths:

Prof. H. M. Hallsworth, C.B.E., first Dale professor of economics in the University of Durham.

Dr. B. Mouat Jones, lately vice-chancellor of the University of Leeds, on September 11, aged seventy.

Mr. A. Marcan, formerly government chemist and chief assayer in Siam, aged sixty-nine.

NEWS and VIEWS

H. Kamerlingh Onnes (1853-1926)

HEIKE KAMERLINGH ONNES, "le gentleman du zéro absolu", was born at Groningen in Holland a century ago, on September 21, 1853. After studying mathematics and physics at the local university, he went to Heidelberg in 1871 to work under R. W. Bunsen and G. R. Kirchhoff. Eight years later he obtained his degree at Groningen with a thesis entitled "New Proofs of the Rotation of the Earth about an Axis". In 1882, at the age of twenty-nine, he was appointed professor of experimental physics and meteorology at Leyden, where he afterwards established the Cryogenic Laboratory which was destined to become famous throughout the world. Under the influence of J. D. van der Waals, Kamerlingh Onnes studied the equations of state and the general thermodynamic properties of liquids and gases. A pioneer of exact physical measurements at low temperatures, his name is associated particularly with the liquefaction of helium in 1908 and with the discovery of the phenomenon of superconductivity. He was a great organizer possessed of infinite patience, and a master of experimental technique, and he trained a staff which included glass-blowers, skilled mechanics and scientific workers from all parts of the world. Kamerlingh Onnes received the Nobel Prize for Physics in 1913 and the Rumford Medal of the Royal Society in 1912. He was elected foreign member of the Royal Society in 1916, honorary fellow of the Chemical Society in 1920, and corresponding member of the Prussian Academy in 1923. During the First World War and during the early post-war years he devoted himself whole-heartedly to relief work in Europe. Modest, genial, cheerful and universally beloved, he died on February 21, 1926.

Earthquake in Western Cyprus

ON September 10, at about 6 a.m. local time, an earthquake occurred with epicentre slightly north of Paphos in Cyprus. The shock, which was registered at Edinburgh, was slightly less intense than the most important of the recent earthquakes in the islands in the Ionian Sea, but nevertheless it caused severe damage and casualties. Three villages, Kithasi, Stroumbi and Ayios Nikolaos, were almost completely destroyed and some 135 other villages within a twenty-mile radius from Ktima were seriously damaged. Much damage was done in Paphos, and the electricity supply and other public services were interrupted. About forty persons were killed and more than a hundred severely injured. Some of the casualties were taken to the hospital at Limassol, where the earthquake was also felt. About fifteen hundred people are known to be homeless as a result of the earthquake. Limassol was shaken by a slight earthquake last year; but the greatest of the recent

past earthquakes in Cyprus happened on January 20, 1941. According to the International Seismological Summary, produced at Kew, the epicentre was at lat. 35.2° N., long. 33.6° E., which is just north-east of Nicosia. This shock, according to J. P. Rothe, of Strasbourg, was felt with intensity IX at Paralimni, thirteen miles from Famagusta (see also *Nature*, 148, 145 and 174 (1941); and 149, 640 (1942)). The depth of focus may have been 100 km. Shocks have occurred at other times from epicentres near Nicosia, near Limassol and at sea to the south of Paphos. Other epicentres have been at sea east of Cyprus (between Cyprus and Latakia). The line of past epicentres appears to stretch from Alexandria in Egypt to Nicosia in Cyprus and then to bend to the east, so that the present epicentre is somewhat north-west of this line.

Fifth British Mathematical Colloquium, Durham, 1953

THE fifth British Mathematical Colloquium was held in Durham during September 8-10. Members were accommodated in University College and Hatfield College, and the main lectures were given in the Applebey Lecture Theatre of the recently opened Science Buildings. Analysis, topology and differential geometry, number theory and algebra were each given one day, the programmes being: September 8: J. L. B. Cooper, "Critical Point Methods of Functional Analysis"; J. D. Weston, "Convolution Algebras"; H. R. Pitt, "Convergence of Fourier Series"; September 9: J. H. C. Whitehead, "The Elements of Homotopy Theory"; M. G. Barratt, "The Calculation of Homotopy Groups"; A. H. Stone, "Coverings of Topological Spaces"; A. G. Walker, "Differential Geometry in the Large"; September 10: K. Mahler, "The Formal Approximation of Analytic Functions by Rational Functions"; E. M. Wright, "Problems about Prime Numbers"; R. A. Rankin, "The Minkowski-Hajós Theorem on Linear Forms and the Factorisation of Abelian Groups"; R. Rado, "Existence Combinatorics—Order in Chaos". In addition, 'splinter groups' displayed much enthusiasm in afternoon discussions of recent research topics in algebra, analysis, algebraic and differential geometry, topology and number theory. The stimulus of talks and debates on present-day activities in mathematical research was felt by all members of the Colloquium. The sixth Colloquium is to be held at Cambridge in April 1954.

Forests, Catchment Areas and Water Supplies throughout the World

UNDER the title of "Forests, Catchment Areas and Water Supplies" (*Indian Forest Records* (New Series), Silviculture, 7, No. 4, 258; 1952), a series of articles by Prof. E. P. Stebbing has been reprinted