

## OBITUARIES

The Earl of Berkeley, F.R.S.

**R**ANDALL THOMAS MOWBRAY BERKELEY, eighth Earl, was born on January 31, 1865, and died on January 15. He was head of the historic house which acquired the Berkeley lands in the twelfth century, and is among the very few that can rightly claim a pre-Conquest pedigree; even the critical genealogist Horace Round allows the Berkeley descent from Eadnoth the Staller, an officer of the household of Edward the Confessor.

In feudal days the Castle of Berkeley was held directly of the King, so that its owner was a baron by tenure, a status which in 1421 was merged in a summons by writ and a hereditary peerage. Since such baronies can be held and transmitted by females, on the death of the sixth Earl in 1882 it passed to his niece, wife of General Milman, who thus became Baroness Berkeley, while the earldom, created in 1679, went to a cousin as heir-male. For some seventy years this title had not been assumed, while there was doubt about its inheritance, leading to a famous lawsuit. Meanwhile the lands were in possession of the Lords Fitz-Hardinge. But in 1891 Randall Berkeley established his claim to the earldom before the Committee of Privileges.

Lord Berkeley began his active career in the Royal Navy and reached the rank of lieutenant. But being drawn to scientific research, he left the Service and built a laboratory at Foxcombe, on Boar's Hill near Oxford, a house which he much enlarged, adding a really fine stone hall. It is now the Theological College known as Ripon Hall. There he carried out his experiments, the success of which was shown by his election to the Royal Society in 1908.

Berkeley's work centred around the idea of measuring the physical properties of concentrated solutions, in order to test the possibility of applying to them equations of the type of that used by van der Waals for gases, vapours and liquids. The fundamental determination required is obviously that of osmotic pressure, either measured directly, or deduced by the principles of thermodynamics from the measured vapour pressures. To obtain accuracy in the results, many and great experimental difficulties had to be overcome. The original method of directly measuring osmotic pressure, invented by Pfeffer, is quite unsuitable when concentrated solutions are used. Instead of allowing solvent to enter a porous porcelain cell closed by a semipermeable membrane of copper ferrocyanide until equilibrium is obtained, Berkeley and his colleague E. G. J. Hartley deposited the membrane in the walls of a porous tube with its ends sealed, and varied the hydrostatic pressure on the solution until no further movement, either in or out, occurred. From 1904 until 1919 a series of papers, most of them in the *Proceedings or Transactions of the Royal Society*, appeared from the Foxcombe laboratory, gradually improving the methods and results, and dealing with other allied subjects, such as the vapour pressures and densities of solutions of varying temperature and concentration. The results of the measurements on bodies like sugars were shown to conform with equations such as

$$\left(\frac{A}{v} - p + \frac{a}{v^2}\right)(v - b) = RT.$$

Berkeley had an instinctive grasp of the methods of

science and, moreover, had the skill, thoroughness and patience to apply them to his complex problems.

In 1916, on the death of his kinsman, the last Lord Fitz-Hardinge, Lord Berkeley inherited Berkeley Castle and the Berkeley estates, comprising valuable property in London as well as the lands in Gloucestershire. He left Boar's Hill and devoted himself to the restoration of Berkeley Castle and to other local activities; for some time he was master of the Berkeley Hounds. His first wife was the widow of Mr. Arthur Jackson. She died in 1898, after which his step-daughter, Miss Sybil Jackson, acted as hostess at Foxcombe. In 1924 he married as a second wife a daughter of John Lowell, of Boston, U.S.A., with whom in these later years he spent much time in Rome and California. He had no children by either marriage and the romantic Earldom of Berkeley becomes extinct.

W. C. D. DAMPIER.

## Dr. F. Holweck

It is reported that the French physicist Fernand Holweck died recently in Paris, but the circumstances of his death are not clear.

Fernand Holweck was both a scientific worker and a technician. He had been educated at the *École de Physique et de Chimie Industrielles de la Ville de Paris*, where Pierre Curie had taught, and became, first an assistant, then a "Chef de Travaux" in Madame Curie's laboratory. He had received the title of *Maitre de Conférences*.

His first important work, for which he received the degree of doctor of science, was on the X-rays of long wave-length (1920-25). He actually filled the gap between the soft X-rays and the extreme ultra-violet rays, by studying the absorption discontinuities characteristic of the *K*- and *L*-levels of light elements. Later (1928-38) he extended the study of soft X-rays to their action, and specially their quantum action, on bacteria and viruses.

In the technical field, so early as 1923, Holweck made a helicoidal molecular pump, and a radio emitting valve which could be opened for the replacement of the electrodes. Both proved to be very useful improvements at the time, and were adopted by the French Navy. Later, in collaboration with R. P. Lejay and P. Chevallier, Holweck constructed an improved portable pendulum for gravitation measurements, and he had been working on this subject since 1930.

F. Holweck received in 1927 the Pierson-Perrin Prize for his work on soft X-rays. In 1936 the Paris Academy of Sciences awarded him the Prince Albert I of Monaco Prize for his work on gravitation.

In the War of 1914-18, Holweck served as radio operator. He was married, and had three children. He was a friendly man and liked to crack a good joke. His inventive spirit, his creative skill and his good nature will be greatly missed by physicists.

A FREE FRENCH SCIENTIST.

WE regret to announce the following deaths:

Dr. W. P. Durfee, emeritus professor of mathematics and emeritus dean of Hobart College, Geneva, N.Y., on December 17, at the age of eighty-six.

Dr. Cornelis Winkler, formerly professor of neuropsychiatry at Amsterdam, and honorary member of the Sections of Neurology and Psychiatry of the Royal Society of Medicine, aged eighty-six.