

The work terminated in April, 1919, and an interesting body of scientific workers was disembodied, disbanded, or demobilised. The more important practical results of their work are being recorded for the use of the military authorities: the methods adopted, however, and many of the observations, calculations, and speculations, the

personalities of the men themselves, their various homes and adventures, the help (and the hindrance) they received from various people and officials, would provide material for a fascinating history of some "applications of physics to war problems"—a history, however, which will probably never be written.

Obituary.

PROF. J. A. McCLELLAND, F.R.S.

JOHN ALEXANDER McCLELLAND was born at Coleraine in 1870. Leaving the High School, he studied in University (then Queen's) College, Galway, and after a distinguished course he obtained a junior fellowship of the Royal University. Proceeding to Trinity College, Cambridge, he worked under Sir J. J. Thomson, and was one of the brilliant band of investigators who made history in those days in the Cavendish Laboratory, being contemporary with Sir Ernest Rutherford, Prof. Townsend, and others. In succession to the late Prof. Preston he became professor of experimental physics in University College, Dublin, and quickly began his famous researches on secondary radio-activity.

Shortly after becoming a fellow of the Royal Society, the National University was founded, and McClelland was appointed a member of the senate and of the governing body of University College, Dublin, positions which he held until his death. He at once devoted himself to the planning of the physical laboratory of the college. His efforts were highly successful, and a very efficient research department quickly sprang up, which accomplished wonders, considering the resources at its disposal. The number of students in the college in the beginning was 550, and at the present moment it is 1350, and the task of keeping pace with such rapid growth might easily have absorbed all the time of a lesser man; but McClelland had many other spheres of activity—secretary to the Royal Irish Academy, member of the Board of National Education, member of the council of the Royal Dublin Society, and governor of St. Andrew's College—yet he undertook a still more onerous task. He became a member of the Privy Council Committee on Scientific and Industrial Research, which necessitated frequent journeys from Dublin to London, and this during the war, when, apart from the great discomforts of travelling in those times, every crossing of the Irish Sea was a gamble with death. The constant strain was too much for him, and oftentimes his friends urged him to take a long rest. His sense of duty, however, prevented him from paying attention to his bodily weakness, and when at last the college authorities persuaded him to take a six months' rest, it was too late.

As a man of science the outlook of McClelland and his method of exposition had all the clarity

of Faraday. Although, unlike Faraday, he had a sound mathematical training, his mind worked in the direction of a "common-sense" explanation of the most complicated phenomena. This made him especially valuable as a teacher, whether for advanced or elementary work. It has been the privilege of the writer to sit with him on many boards, and this same faculty of cutting away the unessentials of a question, and presenting it in its reality, rendered him a valued colleague in many matters far removed from the world of science. A Presbyterian in religion, he was followed to his grave by men of every shade of thought. It is a commonplace almost devoid of meaning to speak of a loss as irreparable, but in his college and in the wider public life of Ireland everyone who knew him feels that a man has gone from amongst us whose place it will be impossible to fill.

A. W. C.

DR. J. G. BARTHOLOMEW.

GEOGRAPHERS throughout the world will recognise that scientific geography has sustained a grave loss through the death suddenly at Cintra about midnight on April 13 of Dr. Bartholomew, the head of the cartographical firm which has been known since 1889 as the Edinburgh Geographical Institute.

Dr. Bartholomew was a native of Edinburgh, where he was born on March 22, 1860, and where he was educated at the High School and the University. As a young man he entered the business founded by his grandfather. From the age of twenty-two he took an active part in its management, and at twenty-nine he succeeded his father in the supreme control. By this time he had devised the method of representing topographical features by the system known as layering, which has made the Edinburgh Geographical Institute celebrated throughout the world, and is now copied in all other cartographical establishments. Like many other novel ideas, it may seem very obvious once it has been introduced. It merely consists in the spreading of distinctive colours, tints, or shades between successive contours on a contoured map. It accordingly gives no information as to the physical features additional to that furnished by the contours; but it

makes that information available at a glance, and hence, simple as the device is, its introduction had a revolutionary effect in cartography, all the more so because it is found capable, like contouring generally, of being combined with other methods of representing physical features.

The first important work issued by the institute illustrating this new system was "The Survey Atlas of Scotland," first published in 1895, which was followed in 1903 by a similar atlas of England and Wales. Previously to that Dr. Bartholomew had published (1899) "The Atlas of Meteorology," a work of immense labour with several original features, which shows even more strikingly his zeal for scientific geography, and amply justifies the motto he had adopted, "Amore et labore." It came out as vol. iii. of a great atlas of physical geography which he had designed, but of which only one other volume appeared during his life, "The Atlas of Zoogeography," published in 1911. Much of the most devoted work of his latter years was given to the preparation of the atlas (reviewed in these columns a few weeks ago) now being published under the title of "The Times Survey Atlas of the World," by which he hoped to out- rival the best works of the kind published in other countries.

But the Geographical Institute was far from engrossing all Dr. Bartholomew's interests. He was a member of council of the Royal Society of Edinburgh from 1909 to 1912, but in Edinburgh he was, above all, known through his intimate association with the Royal Scottish Geographical Society, of which he might with little exaggeration be called the founder. From him, at any rate, came the first suggestion of such a society, and he was among the most eager of that small body of men who in 1884 spent without stint time, energy, and enthusiasm in getting it established. He was an honorary secretary of the society from the first, and remained so until his death. By the council of that society he was generally regarded as its mainstay and chief directing spirit, and nowhere outside his family will his loss be more keenly felt than on that board.

Dr. Bartholomew was an honorary member of many foreign geographical societies. The Victoria Research Medal, a medal not awarded regularly every year, but only when there is a fit recipient, was conferred upon him by the Royal Geographical Society in 1905 "for his successful efforts to raise the standard of cartography"; and in 1918 the Helen Culver gold medal was awarded to him on like grounds by the Geographic Society of Chicago. In 1909 he received from his own university the honorary degree of LL.D. In private life he was held by all who knew him in the highest esteem, and as revealing his nature nothing, perhaps, could be mentioned more characteristic than that, in spite of the fact that he lost a son in the war, he was able to speak even of enemy countries with rare magnanimity.

GEO. G. CHISHOLM.

WE much regret to announce the death on April 18, in his seventy-third year, of DR. RUDOLPH MESSEL, F.R.S., president of the Society of Chemical Industry and past vice-president of the Chemical Society.

WE notice with regret the announcement of the death, very suddenly, on April 17, of PROF. A. K. HUNTINGTON, emeritus professor of metallurgy at King's College, London.

WE regret to record the death on April 18 of PROF. L. T. O'SHEA, professor of applied chemistry in the University of Sheffield and honorary secretary of the Institution of Mining Engineers.

MR. JAMES GAYLEY, whose death was recently announced, was the first vice-president of the United States Steel Corporation and made many important contributions to the progress of metallurgical industry. He was president in 1904-6 of the American Institute of Mining and Metallurgy and had been a member of the Iron and Steel Institute since 1888. The honorary degree of B.Sc. was conferred on him in 1912 by the University of Pennsylvania and Lehigh University; in 1906 he was awarded the Elliott Cresson medal, and in 1913 the Perkin medal, by the Franklin Institute.

MR. WILSON WORSDELL, whose death on April 14 is recorded in the *Engineer*, was born at Crewe in 1850, was educated at Ackworth, and served a pupillage in the Altoona Locomotive Works of the Pennsylvania Railroad. On returning to this country Mr. Worsdell took up an appointment with the London and North-Western Railway, and in 1883 became assistant locomotive superintendent to the North-Eastern Railway; in 1890 he was appointed chief mechanical engineer of the same railway. Up to the time of his retirement in 1910 he supervised the construction of more than 1000 engines for the North-Eastern Railway.

THE death of SIR CHARLES ALLEN on April 13 is recorded in *Engineering*. Sir Charles was born in 1851 and educated at Halifax and at a technical college in Germany. In 1872 he entered the Bessemer works at Sheffield, of which his father, who was a brother-in-law of Sir Henry Bessemer, became chairman in 1889. He succeeded to the chairmanship on the death of his father in 1899, and the remarkable success of the company, especially in later years, is due largely to his ability. Sir Charles recognised fully the value of metallurgical research, and gave every encouragement in the developments of this branch; he was closely identified with the foundation of the Bessemer laboratory at the Imperial College of Science and Technology.