teacher and an organizer and administrator of very great capacity. He passed away on October 26, 1937.

Dr. Fantham had a distinguished university career and held the degrees of M.A.Cantab. (Christ's College) and D.Sc. London (University College). He was a fellow of University College, London.

From 1904 onwards, Dr. Fantham was continuously engaged in university work. He held academic positions in the Universities of London, Cambridge and Liverpool and did war service as parasitologist, first with the Western Command and then in Egypt, Salonika and Malta, until he was invalided. In 1917 he became the first professor of zoology and comparative anatomy in the new University of the Witwatersrand, Johannesburg, South Africa, which post he held from 1917 to 1932. He built up a magnificent department and research school there. He served on the senate of the university, and was four times elected annually as dean of the faculty of science—no small tribute to his ability and integrity—and served for one year on the council of the university. In 1932 he became Strathcona professor and head of the department of zoology at McGill University. Under his guidance and inspiration, the zoology department attracted many students, and its numbers more than doubled. Recognizing the unique opportunity afforded by the numerous lakes and rivers for research in freshwater biology, he developed that work and soon had a number of students keenly interested therein.

Throughout his career, Professor Fantham devoted much time to research, and his many papers on parasitic protozoa, on soil protozoa, on eugenics, heredity and race admixture are well known. Practically every branch of protozoology is the richer from his contributions. He was a most consistent, logical and meticulous worker, who never spared himself. He had published over one hundred research memoirs, as well as books and magazine articles.

He was twice vice-president of the Royal Society of South Africa, was grand president of the South African Association for the Advancement of Science in 1927 and South Africa Medallist in 1931. He was one of the few non-medical fellows of the Royal Society of Medicine, was a fellow of the Zoological Society of London, the Cambridge Philosophical Society, Royal Society of Tropical Medicine and Hygiene, American Society of Parasitologists, American Association for the Advancement of Science, vice-president of the Eugenics Research Association and corresponding member of the Société pathologie éxotique of Paris. While he was in Canada, he was a regular attendant at the meetings of the American Association for the Advancement of Science and much appreciated this opportunity of meeting his fellow zoologists.

Dr. Fantham was much beloved by his students wherever he taught. He never spared himself on their behalf, and his home and library were always at their disposal. He was an artist of far more than average ability, a good speaker and public lecturer, very musical and with extremely wide interests. His fellow scientists mourn his early passing, which has left a gap that can not be filled.

RECENT DEATHS AND MEMORIALS

DR. GARDNER CHACE ANTHONY, dean emeritus of the Engineering School of Tufts College, died on November 28 at the age of eighty-one years.

PROFESSOR JOSÉ COMAS Y SOLA, director of the Fabra Observatory of the Academy of Arts and Sciences in Barcelona, died on December 2 at the age of sixty-nine years.

SIR CHARLES BRIGHT, London, an authority on telegraphy, died on November 20 at the age of seventy-three years.

THE death is announced of Dr. Ludwig Plate, who was the successor of Haeckel as professor of zoology at Jena and director of the Phyletic Museum. He had made extensive journeys to South America, the West Indies and Ceylon.

SIR GEORGE LEE, engineer-in-chief of the British Post Office and president of the British Institute of Electrical Engineers, unveiled on November 24 a mural tablet at the house where Alexander Graham Bell was born at 16 Charlotte Street, Edinburgh.

THE Physical Institute of the Moscow State University held on November 14 a memorial session for Lord Rutherford, who died on October 19. Professor Kapitsa, a member of the Academy of Sciences of the Union of Soviet Socialist Republics, who was a close collaborator for fourteen years, gave an address on his memories of Lord Rutherford.

SCIENTIFIC EVENTS

RESEARCH IN THE AMERICAN CHEMICAL INDUSTRY

ACCORDING to an article entitled "Facts and Figures of the American Chemical Industry," published by *Chemical and Metallurgical Engineering*, during the current year chemical manufacturers have spent $20,000,000, and chemical process industries several times this amount for research. It is pointed out that research in this field is of unlimited benefit in serving the public welfare, not alone in promoting health with

antiseptics, pure water, insecticides, fumigants, waste disposal, etc., as well as in purely practical ways. A few instances of the way it has lowered prices are given: "Before research one pound of iodine cost $4.50, after research, $1.30; one ampule of salvarsan before research cost $3.50 a dose, after research 20c a dose."

Products have also been improved by chemical research: "In 1910 an automobile tire costing $50 produced 5,000 miles; in 1936 a tire costing $15 will give 20,000 miles. The estimated annual savings to American motorists amount to $3,002,580,000." Chemical research has created new industries: "The production of synthetic resins in 1934 was over 100 million pounds, as compared with around 8 million pounds in 1924." It has freed industries from foreign monopolies: "Domestic production of dyes has risen to over 100 million pounds and our imports have dwindled from 50 million to about 5 million pounds a year; on the other hand, our exports have risen from nothing to about 20 million pounds annually." Out of every $100 in sales of inorganic chemicals, $2.25 is spent for research; out of every $100 in sales of organic chemicals, $4.30 is spent for research. Chemical research has resulted in:

New and improved processes.
Lower costs and lower prices of products.
New services and new products never before known.
Change of rarities to commercial supplies of practical usefulness.
Adequate supply of chemicals previously obtained only as by-products.
Freedom for American users from foreign monopoly control.
Stabilization of business and of industrial employment.
Products of greater purity.
Products of superior service, *e.g.*, light-fast dyes.
New medicines and other new health aids.
More efficient use of raw materials.
More efficient by-product recovery.

Chemical and Metallurgical Engineering writes:

Even during depression times there were in the United States approximately 1,600 industrial research laboratories with more than 22,000 technically trained men and women at work. Process industries were outstandingly first in rank as to number of laboratories, number of investigators and amount of money expended.

Educational records show the growing importance of chemical research. Nearly a third of all the doctorate degrees conferred by American universities are in the field of chemistry and chemical engineering. Over 3,000 graduate students are engaged in chemical research during their postgraduate college years. And to-day the demand for graduate degrees in chemical engineering exceeds the demand in all other divisions of engineering combined.

Research creates, chemical engineering develops and chemical industry makes commercially possible the advances of science. The result is human benefit, as well as industrial achievement, worth many times the immediate cost in dollars and cents.

THE AMERICAN STANDARDS ASSOCIATION

AT a meeting of the Board of Directors in New York City in October Dana D. Barnum, president of the American Standards Association, announced that eleven new industrial groups had joined the association since last March. These are the National Elevator Manufacturing Industry, the National Retail Dry Goods Association, the Brick Manufacturers Association of America, the Brick Manufacturers Association of New York, the American Trucking Association, the U. S. Independent Telephone Association, the Associated General Contractors of America, the American Society of Refrigerating Engineers, the Asphalt Shingle and Roofing Institute, the Heat Exchange Institute, the Hydraulic Institute.

This brings the basic membership of the association to a total number of seventy national organizations—trade associations, technical societies, departments of the federal government.

Following election in the summer two new members took their seats on the board. R. E. Zimmerman, vice-president of the United States Steel Corporation, represents the American Iron and Steel Institute, and C. E. Collens, president of the Reliance Electric and Engineering Company and past president of the National Electrical Manufacturers Association, fills the place left vacant last July by the retirement from active business of S. L. Nicholson.

As a result of the recent meetings of the International Standards Association in Paris, the United States and Italy have been invited to fill the two vacancies on the International Standards Association Council occurring through completion of the terms of Japan and Hungary. Mr. Cyril Ainsworth, assistant secretary, who attended the meetings for the American Standards Association, reported that the national standardizing bodies of seventeen countries were present. International standardization projects on aeronautics, automobiles, ball bearings, coal, navigation, tools, petroleum products, iron and steel, were among the subjects discussed. C. B. Veal, research manager of the Society of Automotive Engineers, and R. T. Brown, of the Goodyear Tire and Rubber Company, took part in the committee work on automobiles, tires and rims, and tire valves, aeronautics and petroleum products.

Among new projects, the International Standards Association is organizing five committees for standardization work in the field of acoustics—one on International Vocabulary, one on Units and Methods of Measurement, one on Electro-Acoustics, one on Archi-