

ruption until his death, where, for fourteen years, he had been professor of physics and director of the Sloane Physical Laboratory. Prof. Bumstead was the most enthusiastic and devoted of Yale men. He came over to Cambridge in 1904, and worked for a year at the Cavendish Laboratory; the result of his work is contained in a paper in the *Philosophical Magazine* for June, 1906, p. 292, on the heating effects produced by Röntgen rays in different metals. On his return to America he made, in spite of serious ill-health, important researches on the properties of α -rays.

Excellent as Prof. Bumstead's published work is, it gives but an inadequate idea of his powers, or of his singularly clear and sane judgment. He edited the collected works of Willard Gibbs—the greatest physicist ever associated with Yale. When America joined in the war, he threw all his energies into the application of science to the purposes of the war, and at the end of 1917 he came over to this country as Scientific Attaché to the American Embassy. Prof. Bumstead's duties were to co-ordinate the scientific work done in America and in England and France, so that the results obtained in one country should be as soon as possible at the services of the others. For this work his personal qualities and scientific attainments made him especially fitted, and he did most valuable work whilst he was in this country. He was at the time of his death president of the National Research Council in the United States.

Prof. Bumstead had a singularly attractive and charming personality. Sympathetic, modest, without a trace of self-assertion, he was the most delightful companion and most valued friend.

J. J. T.

PRINCE P. A. KROPOTKIN.

THE death of Prince P. A. Kropotkin at Dmitrov, near Moscow, on Friday last, January 28, deprives the world of a picturesque figure and science of a devoted student. For many years Prince Kropotkin was an esteemed contributor to the columns of *NATURE*, and when he left England to return to Russia in 1917 he wrote to express regret that the very close relationships which had existed between him and us for so long were being severed. He said at the same time that he had been a reader of *NATURE* from the first number, and had even been permitted to receive it while a prisoner in the fortress of St. Peter and St. Paul in St. Petersburg.

Prince Kropotkin was born on December 9, 1842. At the age of fifteen he entered the select military school at St. Petersburg; on leaving he joined a Cossack regiment stationed on the Amur, and while aide-de-camp to the commander of the General Staff in Eastern Siberia, he crossed North Manchuria from Transbaikalia to the Amur and up the Sungari to Kirin, travelling in all as many as 50,000 miles. In 1867 he abandoned a military career, and returned to St. Peters-

burg, where he entered the University, and devoted himself seriously to geographical work. He then became closely associated with political movements, and gave himself up to propaganda. In 1873 he was arrested and imprisoned, but escaped in the following year and made his way to England, shortly afterwards going to Switzerland. After the assassination of Alexander II., Kropotkin was expelled from Switzerland, and settled in Savoy, where he was arrested in 1883 on a charge of organising a dynamite outrage, and was condemned to five years' imprisonment, but was released in 1886. He then returned to England, and remained here until June, 1917.

In 1876 Kropotkin published his "Researches on the Glacial Period," in which he described a journey in Finland and a short visit to Sweden, both made in 1871, under the auspices of the Russian Geographical Society, for the special purpose of studying the glacial formations and the eskers. His conclusions were that this low tableland was once covered by an immense ice-sheet, which, creeping from Scandinavia, crossed the Gulf of Bothnia and traversed southern Finland in a direction south by east, leaving behind it the marks of its course in the shape of numberless striæ and moraines.

Perhaps Kropotkin's most notable work was "Mutual Aid, a Factor in Evolution," published in 1902. The view put forward was that in the case of animals there is very little evidence of any struggle for existence among members of the same species, though plants, beyond all doubt, jostle their own kin out of existence. Animals, as a rule, are banded together for mutual protection, and those that have the best organisation for mutual defence are those that thrive best. Among men, mutual aid is more general than among animals; among savages, it is the chief factor in evolution. Kropotkin traced the growth of the modern benefit societies, co-operative associations, and trade unions back through successive stages of the history of a nation—through the State, the medieval city with its fortifications and hired defenders, the village communities, and finally to the clan, showing how man has attained his present position chiefly by practising mutual aid. There is no doubt that in the development of this thesis Kropotkin was keenly interested, and that the work itself represents, more closely than anything else he did, the main trend of his conception of the meaning of life and progress.

Kropotkin was a pioneer advocate of the intensive cultivation of crops, and in a suggestive little book entitled "Fields, Factories, and Workshops" he described what was done in this direction in Guernsey, as well as indicated how similar principles of culture could be applied elsewhere. His view was "that 600 persons could easily live on a square mile, and that with cultural methods already used on a large scale 1000 human beings—not idlers—living on 1000 acres could easily, without any kind of overwork, obtain from that area a luxurious vegetable and animal food, as

well as the flax, wool, silk, and hides necessary for their clothing."

These two latter works reveal Kropotkin's unbounded faith in man and his hope for a high human destiny through the reconstruction of society and communal production. His knowledge extended over a wide scientific field, and his interest in its advancement never failed. His many friends in this country will long cherish his memory with affection and esteem.

THE death occurred, on January 18, of MR. RUPERT FARRANT, at the age of thirty-six years. Mr. Farrant was educated at the Westminster Hospital, and he studied also at King's College and St. Bartholomew's Hospitals; after he had qualified as a practitioner in 1906, he held many resident posts in various London hospitals. In 1909 he was made a fellow of the Royal College of Surgeons, and on two occasions he delivered Hunterian lectures at the college. Mr. Farrant made a special study of the ductless glands, especially of the thyroid, in connection with the

general metabolism of the body, and he put forward a theory of a correlated cycle of changes in the histological appearance and functional activity of the gland under the influence of toxins. He saw active service at Gallipoli, in Egypt, in Mesopotamia, and in France, where he received injuries by a shell explosion, from the concussion of which he never completely recovered.

It is with deep regret that we learn of the sudden death, on January 31, in his fiftieth year, of DR. J. C. CAIN, editor of the Chemical Society's publications since 1906, and author of leading works on synthetic dyestuffs and intermediate products.

WE much regret to announce the death, on January 30, at sixty-five years of age, of MR. C. E. FAGAN, secretary of the British Museum (Natural History), to whose expected retirement after a long period of devoted service reference was made in our Notes columns on January 13, p. 638.

Notes.

THE gold medal of the Royal Astronomical Society has been awarded by the council to Prof. H. N. Russell for his contributions to the study of stellar evolution. It will be presented to Prof. Russell at the annual general meeting to be held on Friday, February 11, when the president of the society, Prof. A. Fowler, will deliver an address on the notable work for which the award has been made.

THE Lords Commissioners of the Treasury have appointed Sir Robert Robertson, K.B.E., F.R.S., Director of Explosives Branch, Research Department, Woolwich, to be Government Chemist in succession to Sir J. J. Dobbie, who has retired.

A MEMORIAL lecture on the life and work of the late Sir William Abney is to be delivered to the Royal Photographic Society of Great Britain by Mr. Chapman Jones. April 26 next has been provisionally fixed for the date.

THE council of the Chemical Society has arranged to hold the anniversary dinner at the Hotel Cecil on Thursday, March 17 (the day of the annual general meeting), at 7 for 7.30 p.m., and to invite, as guests of honour, the past-presidents who have attained their jubilee as fellows of the society.

DR. W. R. G. ATKINS, of Trinity College, Dublin, has been appointed head of the department of general physiology at the Plymouth Laboratory of the Marine Biological Association.

SIR NORMAN MOORE, president of the Royal College of Physicians, has appointed Dr. Herbert Spencer to deliver the Harveian oration on St. Luke's Day (October 18), and Dr. Michael Giabham, of Madeira, to deliver the Bradshaw lecture in November. The council has appointed Dr. Major Greenwood to deliver the Milroy lectures in 1922.

NO. 2675, VOL. 106]

A DISCUSSION on gravity at sea will be held in the rooms of the Royal Astronomical Society, Burlington House, to-morrow, February 4, at 5 p.m. The chair will be taken by Sir Arthur Schuster. Prof. W. G. Duffield will open the discussion, which will be continued by Sir S. G. Burrard, Dr. H. Jeffreys, Dr. J. W. Evans, and Dr. A. Morley Davies.

A SPECIAL joint meeting of the Society of Chemical Industry and of the Institution of Mechanical Engineers will be held at the rooms of the institution, Storey's Gate, Westminster, S.W.1, on Friday, March 4, at 6 p.m., when M. Paul Kestner, president of the Société de Chimie Industrielle, will read a paper on "The De-gassing and Purification of Boiler Feed-water."

At the meeting of the London Mathematical Society to be held in the rooms of the Royal Astronomical Society at Burlington House, W.1, on Thursday, February 10, at 5 p.m., Prof. A. S. Eddington will deliver a lecture on "World Geometry." The lecture will be concerned with the mathematical side of the general theory of relativity, with especial reference to electricity and gravitation and the work of Prof. H. Weyl. Visitors from other societies will be welcome.

IN the issue of NATURE for January 27 there appeared an illustration (p. 699, Fig. 2) of a sculptured group from the decoration of the building of the Institute of Human Palæontology in Paris. The official description which was supplied with the photograph stated, no doubt by inadvertence, that the anthropoid forming part of the group was an orang-utan. A close inspection, however, shows that it is undoubtedly a gorilla.

Science of January 14 announces that the Rockefeller Foundation has given to France complete con-