ject, perpetually perplexed with new problems, to have at its command the unerring judgment of Lord Rayleigh and his knowledge of theory and his keen instinct for practice. During the war, when any specially important or specially difficult point arose in connection with the application of science for the use of the Army or Navy, Lord Rayleigh was

very often consulted, and never in vain. Lord Rayleigh, I believe, has had every honour that this country can bestow, and he deserves that place on the walls of the Abbey close by the memorials to Davy and to Young, for, like them, he increased the prestige of this country in science, and widened the bounds of our knowledge of nature.

International Physico-chemical Symbols.

By PROF. ALEX. FINDLAY.

IN the years prior to the war endeavours were made by various internationally constituted bodies to secure greater uniformity in the symbols used in different countries and by different writers to represent physical, physico-chemical, and electrotechnical quantities. As part of the general movement to this end the International Association of Chemical Societies, founded in 1911, set up a Commission for the Unification of Physico-chemical Symbols, and in 1913 this commission submitted to the council of the International Association of Chemical Societies a list of symbols for quantities especially of physico-chemical importance. At this point, however, the need was felt for co-ordinating the work of the commission with that of other bodies, and a small "working committee," consisting of Sir William Ramsay (chairman), Dr. Friedrich Auerbach, Profs. P. A. Guye, P. J. Walden, and Alex. Findlay (secretary), was therefore set up in order to secure this co-ordination and to suggest methods of organisation and work.

The list of symbols drawn up by the Commission for the Unification of Physico-chemical Symbols was submitted for consideration and criticism to the chemical societies of the different countries represented on the International Association, to the Ausschuss für Einheiten und Formelgrößen, and to the International Electrotechnical Commission. The criticisms and suggestions received from these bodies were considered in May, 1914, by the working committee to which reference has been made above, and a list of symbols was then drawn up for the approval of the International Commission. Unfortunately, however, before the meeting of the International Commission took place, international scientific relations were ruptured by the outbreak of war, and the list of symbols recommended unanimously by the members of the working committee could not, therefore, receive the approval of the parent commission. As it is not to be doubted that this approval would have been given, and as it would have been a misfortune if the labours of the committee on which Great Britain, France, Germany, Russia, and Switzerland were represented had been in vain, the council of the Chemical Society, with the approval of the recently constituted International Union of Pure and Applied Chemistry, authorised the publication of the committee's

report and list of symbols in the Transactions of the Chemical Society, April, 1921.¹

As regards the general principles adopted by the working committee it may be said that in drawing up its list the committee restricted itself to symbols for quantities of chemical or physico-chemical importance and approved the general principle adopted by the International Commission that Greek letters should be used as sparingly as possible. In respect of symbols for quantities used, especially in mathematics, physics, and the various branches of mathematics and physics, the committee restricted itself to *noting* the symbols which had been recommended or adopted by the scientific bodies specially interested in these quantities, and there were included in the committee's list only those symbols about which there was general agreement among the specially competent bodies. As it was not possible, in the case of symbols which are employed in different branches of pure and applied science, always to obtain agreement among the representatives of different sciences, the committee adopted the symbols which find, or are likely to find, general acceptance by chemists or physico-chemists.

Although a practically universal agreement already obtained regarding many of the symbols, there were a number of quantities for which diverse symbols were employed by different writers or were suggested by various bodies. It was necessary, therefore, for the committee to examine, carefully and critically, the different suggestions and to make a decision as to the symbols to be recommended for use. The reasons for the choice of symbol made by the committee in the debated cases are appended to the list of symbols.

Although it is not possible to refer specifically to all debatable cases, reference may be made to a few important quantities. For entropy and for maximum work the committee recommends the symbols *S* and *A* respectively, although in doing so regret is expressed at having to depart from the classical symbols ϕ and ψ employed by Willard Gibbs. The committee, however, states that it felt such departure to be advisable on the twofold principle of disturbing existing usage as little as possible and of employing Greek letters as sparingly as possible. For degree of dissociation

¹ Copies of the report and list of symbols may be obtained on application to the Assistant Secretary of the Chemical Society, Burlington House, London, W.1.

(ionic, thermal, etc.) the committee recommends the symbol α ; for the ratio of specific heats the symbol γ ; and for electrode potential, as for electromotive force, the symbol E . It may also be noted that the committee recommends that kation should always be spelt with a "k."

While the committee considered it to be in-

advisable that any attempt should be made to compel authors to use the symbols which it recommends, it was of opinion that every means should be taken to encourage the use of these symbols, and it remains for the different official bodies concerned to consider how such encouragement can best be given.

Obituary.

DR. J. A. ALLEN.

MR. H. E. ANTHONY, associate curator of mammals in the American Museum of Natural History, New York, has sent us a detailed notice of the life and scientific work of Dr. J. A. ALLEN. Lack of space prevents us from publishing more than the following extracts referring to a few points of particular interest:—

Natural history has suffered a heavy loss by the death, on August 29 last, of Dr. Joel Asaph Allen at eighty-three years of age. Dr. Allen was best known for the work in mammalogy which he carried out as curator of ornithology and mammalogy in the American Museum of Natural History of New York City. However, his activities were manifold, and an insight into the truly remarkable amount of work accomplished by Dr. Allen may be gained from a glance at his bibliography, which in 1916 included the following: Papers on mammals, 271; on birds, 966; on reptiles, 5; on zoogeography, 9; on evolution, 22; on nomenclature, 35; on biography, 134; miscellaneous, 20; a total of no less than 1462 papers. Since the publication of this list other papers have appeared and a great deal of unpublished manuscript has been prepared for publication. One could not but be impressed by such a list as a mere feat of writing alone, but the workers in his field who consult the publications of Dr. Allen know that an infinite amount of patience, of painstaking application to tiring detail, and of well-balanced and judicious weighing of facts, is characteristic of his papers.

The bulk of Dr. Allen's papers deal with taxonomic questions, with the identification of collections and with the revision of groups. Many of the latter have become classical, and among the best-known might be mentioned the monographs on North American Rodentia, written in collaboration with Dr. Elliot Coues. Dr. Allen had marked capabilities for philosophical research into, and interpretation of, the phenomena of zoology, as is well shown by some of his earlier papers, but circumstances directed that he should expend his energies in other directions.

One of his youthful aspirations was for editorial work, and from 1874, when he edited his first "Proceedings of the Boston Society of Natural History," until 1918 he performed continuous service as editor of several scientific publications. For thirty-two years of this period he edited the *Bulletin of the American Museum of Natural History*, and for twenty-eight years the *Auk*.

NO. 2719, VOL. 108]

Probably Dr. Allen is best known internationally through his authoritative position on zoological nomenclature. In this exacting field he was pre-eminent; internationally his worth was recognised by his position on the International Commissions since 1910.

Among the many honours which Dr. Allen received may be mentioned the Walker Grand Prize of the Boston Society of Natural History in 1903, and the medal of the Linnæan Society of New York in 1916; he was president of the American Ornithologists' Union, 1883-91, president of the Linnæan Society of New York, 1890-1897, member of the National Academy of Sciences, etc. He was also an honorary member of the British Ornithologists' Union, the Zoological Society of London, the Australian Ornithologists' Union, and the South African Ornithologists' Union.

The early part of Dr. Allen's life was spent in New England. That part of his academic training which had most influence upon his later life was his association with the great teacher, Louis Agassiz. Struggling under the handicap of a constitution at no time very strong, he made several notable collecting trips, the most important being that to Brazil in 1865. His first museum appointment was with the Museum of Comparative Zoology at Cambridge, Massachusetts, but in 1885 he took a curatorship in the American Museum of Natural History of New York City. Here his tenure was continuous until the time of his death.

Dr. Allen numbered among his friends practically all the well-known workers on birds and mammals, and the respect for his scientific attainments promptly grew into a love of the man himself whenever one was fortunate enough to be numbered among his personal friends.

W. A. BAILLIE-GROHMAN.

It is with much regret that we record the death of Mr. W. A. Baillie-Grohman, who passed away suddenly on November 27 at Schloss Matzen, in Tyrol, in his seventy-first year. A man of striking physique, endowed with high courage and great mind, he possessed an intense affection for the wild and grand in Nature, coupled, remarkably enough, with an unflagging interest in much that is purely scholarly. That such a man, the son of a sporting Austrian of large estate, should have developed in early youth what proved to be permanent tastes for hunting and mountaineering was perhaps inevitable, and in due course his adven-