News and Views

Royal Society Elections

AT the meeting of the Royal Society held on May 3, the candidates whose names were given in NATURE of March 10, p. 352, as having been selected by the Council for fellowship of the Society, were duly elected. In addition, two foreign members were elected, namely, Prof. H. L. Lebesgue, of Paris, the discoverer of 'Lebesgue integration', and Prof. O. Warburg, of the Kaiser-Wilhelm Institut für Zellphysiologie, Berlin-Dahlem, who is known for his work on cellular metabolism and respiration.

Prof. Henri-Léon Lebesgue, For. Mem. R.S.

HENRI-LÉON LEBESGUE was born in 1875 at Beauvais, and after studying at the Ecole Normale Supérieure, taught from 1899 until 1902 in the Lyceé at Nancy, where he wrote his famous thèse de Doctorat "Intégrale longueur, aire", which was published in the *Annali di Matematica*, in 1902. After holding academic posts at Rennes and Poitiers, he was appointed in 1910 lecturer at the Faculty of Sciences of Paris, in 1921 professor of mathematics at the Collège de France, and in 1922 a member of the Academy of Sciences. Prof. Lebesgue's reputation was first made by his definitions of the functional operations of integration and derivation, which are of such generality that they may be applied to classes of functions vastly more extensive than the restricted classes to which earlier definitions had been applicable. It was Cauchy who first replaced the geometrical idea of an integral, as an area, by a precise arithmetical definition, regarding it as the limit of a sum of elements $f(x)\ \Delta x$ when Δx tends to zero ; and on this basis he proved theorems of existence and uniqueness. Riemann generalised Cauchy's conception by extending it to certain functions which were discontinuous at points forming sets dense everywhere ; but the functions integrable in Riemann's sense are still a limited class.

IN order to obtain a more general definition, Lebesgue first devised a theory of the 'measure' of a set of points, which was a great improvement on the theory of 'content' previously given by Cantor, namely, that the content of the sum of two sets is not in general the sum of their contents, whereas the measure of the sum of two mutually exclusive sets is always the sum of their measures. He then departed from the procedure of Cauchy and Riemann for defining $\int f(x)dx$, by dividing the range of variation of $f(x)$ into intervals (as contrasted with dividing the range of variation of x into intervals), and considering the measures of the sets of points belonging to these intervals, whence a definition of the integral naturally follows. Lebesgue's definitions of integration and derivation have led to developments of far-reaching importance in the theories of Fourier series and other trigonometric series, of singular integrals, integral equations, Dirichlet's problem, the calculus of variations, functional operations, and the properties of analytic functions in the neighbourhood of their singularities.

Prof. O. Warburg, For. Mem. R.S.

PROF. OTTO WARBURG is well known for his very important work on metabolism and respiration in cells. In this work he made extensive use of the manometric technique, which he greatly developed. This method was applied by him and the members of his school to a great variety of biological problems with conspicuous success. By using very thin slices of animal tissues suspended in serum, precise measurements of respiration and other metabolic processes could be made under approximately physiological conditions. By this means he discovered an important difference between the metabolism of normal tissues and that of rapidly proliferating tissues such as tumours, namely, the fact that the latter show a high ærobic glycolysis. By the study of the inhibitory effect of certain specific poisons, such as cyanides and carbon monoxide, on respiration, he showed the important rôle played by catalytic compounds of iron. On studying the effect of light of different wavelengths on cells poisoned by carbon monoxide, a photochemical absorption spectrum was obtained which was found to be very similar to that of a hæmatin compound. In this way he showed the importance of hæmatin compounds in cell respiration. In the analysis of these effects he displayed remarkable technical genius. In addition to this hæmatin system (known as the respiratory enzyme), Prof. Warburg has recently discovered another important intracellular system involving a different type of catalytic pigment, belonging to the class now known as flavines. Prof. Warburg is also well known for his fine work on photosynthesis.

Bicentenary of Stahl (1660-1734)

Two hundred years ago, on May 14, 1734, Georg Ernst Stahl, the celebrated German physician and chemist, died at Berlin at seventy-three years of age. For many years he had been physician to Frederick I, King of Prussia, and he was widely known for his original views and for his numerous writings. He wrote, edited or superintended no fewer than 250 works. Born at Anspach, Bavaria, on October 21, 1660, at a time when Germany was just recovering from the terrible effects of the Thirty Years War, he studied medicine at Jena ; at the age of twenty-seven years became physician to the Duke of Weimar and six years later was appointed professor of medicine, anatomy and chemistry in the newly founded University of Halle. He taught there for twenty-two years (1693–1716), and it was during that time he enunciated the doctrines of vitalism and animism and the theory of phlogiston, the latter a generalisation which did much to make chemistry a science. "The doctrine of phlogiston," says Thorpe, "was embraced by nearly all Stahl's German contemporaries, notably by Marggraf, Neumann, Eller and Pott. It spread into Sweden, and was accepted by Bergmann and Scheele ; into France, where it was taught by Duhamel, Rouelle and Macquer ; and into Great Britain, where its most influential