

OBITUARIES

Prof. T. Levi-Civita, For. Mem. R.S.

TULLIO LEVI-CIVITA was born at Padua on March 29, 1873, son of a renowned advocate who was mayor of Padua and senator of the realm. He entered the University of his native city where, after studying with Veronese and Ricci, he graduated in 1894; four years later he was appointed to the professorship of mechanics at Padua. In 1914, he married Sig.na Libera Trevisani, one of his former students. In 1918, he was called to the University of Rome, where he occupied the chair of theoretical mechanics until his dismissal, in 1938. He died in Rome, after a lingering illness, on December 29.

Levi-Civita was unquestionably one of the best-equipped and most versatile mathematicians of our time: primarily an applied mathematician, he had been strengthened by the magnificent discipline of the Italian geometrical school which, apart from inspiring his valuable researches in differential geometry proper, furnished him with powerful weapons for attacking the problems of physical science. In the latter field his interests were all-embracing, and he made important contributions to such diverse topics as potential theory, wave motion, hydrodynamics, analytical dynamics, relativity theory, thermodynamics and theoretical physics, in particular, quantum mechanics. On the more technical side, where he was often called into consultation by his colleagues, he studied various complex problems in electrodynamics, elasticity and strength of materials, devising practical methods of calculation which have since proved their worth.

In the field of pure mathematics his interest was scarcely less extended. One may mention that his first papers were on the distribution of prime numbers and the foundations of geometry; afterwards, as a natural outcome of his other work, he was drawn to the study of conformal representation—in which, as regards its applications, he was one of the pioneers—and the theory of partial differential equations. He also made one of the earliest contributions to the theory of functions of two complex variables: all this, be it observed, in addition to the work in differential geometry for which he is chiefly celebrated.

At this point it is interesting to recall that Levi-Civita's teacher, Ricci, was once refused a Royal Prize for his work on tensor calculus, on the ground that it could not conceivably be of use to anyone, even a differential geometer. An apt comment on this verdict was later to be provided by Einstein's general theory of relativity, the foundations of which were actually laid in a great memoir by Ricci and Levi-Civita themselves. However, both before and after the tensor calculus had become useful, Levi-Civita was its most assiduous cultivator; and during a long period the *Rendiconti* of the Lincei were enriched by a series of notes on differential geometry, treated by its methods. These researches culminated in the memoir of 1917, introducing the concept of parallelism with which his name is associated, and constituting perhaps his surest title to fame.

The fecundity of such a great and varied production is amply proved by the number of disciples who have followed in its wake and the schools which have found inspiration in its conceptions. This multiform activity was centred, not in the published work, but

directly in its creator. For more than forty years Levi-Civita was one of Italy's greatest teachers, drawing to himself students from all over the world, aiding and encouraging them with inexhaustible patience and generosity. Part cause, part effect of these contacts was a knowledge of mathematical literature that was truly encyclopædic; until the end Levi-Civita maintained his grasp of nearly the entire range of contemporary mathematics, and with his reading went a vast scientific correspondence, to which he attended with his customary diligence and zeal. As a writer of text-books, Levi-Civita is mainly known in Great Britain by the English version of his work on the tensor calculus; but it should be added that his comprehensive treatise on mechanics (written in collaboration with Amaldi) is the leading Italian work on the subject. A course of lectures on differential systems and wave propagation has also been published in book form.

Nevertheless, however splendid his achievement, to those who have known him it must always take second place to the man himself. This cannot often be said of a mathematician; not to say it of Levi-Civita would be unjust to his memory. The exquisite courtesy, the humility carried to such lengths that it might have been judged hypocrisy in another, were typical manifestations of his generous spirit. Many will have received some special token of his kindness; many more will have enjoyed his hospitality, or carry with them the indelible souvenir of his presence in the lecture room: the characteristic figure on the rostrum expounding, with overwhelming enthusiasm, some point in the theory of mechanics or differential equations.

Levi-Civita was the recipient of many academic distinctions and honorary member of numerous societies, in particular, of almost all the scientific academies of Italy and Germany. In 1938, when dismissed from his post in consequence of the racial legislation, he was also expelled from the latter, with the sole exception of the Pontifical Academy of Sciences. In Italy itself his death occasioned no official response, save within the Vatican City, where, at a recent session of the Pontifical Academy, he was duly commemorated. His last years had been overcast by an ever-deepening pre-occupation with the future of his country; it is easy to imagine how so liberal a mind, coloured with the Garibaldian traditions of his early education, viewed the progressive decay of international relations and ethical standards. With his death there has passed away a man of science and an Italian whom we can ill afford to lose and whom we shall not soon see replaced.

L. ROTH.

Dr. A. K. Chalmers

WE regret to announce the death at the age of eighty-six of Dr. Archibald Kerr Chalmers, one of the most eminent contemporary epidemiologists. He was born at Greenock in 1856, and received his medical education at Glasgow, to which he remained faithful, and qualified in 1879. After holding resident appointments at the Glasgow fever hospital, he was appointed medical officer of health for that city in 1892, and held the office until his retirement in 1925. Throughout his life he showed a remarkable administrative and literary activity. During his term of office he was busily engaged in the management of acute infectious diseases. Besides Chalmers's principal