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(*b*. Budapest, Hungary, 2 October 1908; *d*. Edinburgh, Scotland, 12 December 1977)

mathematics.

Arthur Erdélyi was the first child of Ignác and Frieda (Roth) Diamant. After his father's death, he was adopted by his mother's second husband, Paul Erdélyi. He attended elementary school in Budapest from 1914 to 1926. After studying at the Deutsche Technische Hochschule in Brno, Czechoslovakia he matriculated at the German University of Prague and was awarded the degree of doctor rerum naturalium in 1938. Forced by the Nazis to flee Czechoslovakia, Erdélyi managed to obtain a research grant from from Edinburgh University, where in 1940 he was awarded the degree of doctor of science. In 1942 he married Eva Neuburg, and in 1949 he left Edinburgh to become a professor at the California Institute of Technology. He returned to Edinburgh in 1964 as professor of mathematics, remaining there until his death. In 1975 Erdélyi was elected a fellow of the Royal Society of London, and in 1977 he was awarded the Gunning Victoria Jubilee Prize of the Royal Society of Edinburgh.

Erdélyi began his mathematical career with a study of the confluent hypergeometric function and before arriving in Edinburgh in 1939 had already established himself as a leading expert in the area of special functions. In Edinburgh he continued to pursue his investigations, broadening his interests into generalized hypergeometric functions, classical orthogonal polynomials, and, in particular, Lamé functions, on which he published a series of fundamental papers. His career at Edinburgh University was interrupted, however, by the death at Caltech of Harry Bateman, who left behind voluminous notes on special functions that demanded editing and publication. After due consultation with leading experts, Erdélyi was appointed by Caltech in 1947 to supervise the editing and publication of the Bateman manuscripts. With him came F. G. Tricomi from the University of Turin, W. Magnus from the University of Göttingen, and F. Oberhettinger from the University of Mainz. Together they produced the threevolume *Higher Transcendental Functions* (1953–1955) and the two-volume *Tables of Integral Transforms* (1954). These books became basic reference sources for generations of applied mathematicians and physicists throughout the world, and the most important part of this work, *Higher Transcendental Functions*, remains the most scholarly and comprehensive treatment of the special functions of mathematical physics that is available.

The Bateman Manuscript Project marked a turning point in Erdélyi's development as a mathematician. As the project neared completion, he turned from an investigation of special functions for their own sake to the study of asymptotic expansions of integrals and solutions of differential equations. Erdélyi's most important contribution to this area was in the asymptotic evaluation of integrals. Fundamental to many of his investigations was the idea of an asymptotic scale and generalized asymptotic expansion, an idea that dates back at least to H. Schmidt but that Erdélyi was the first to exploit on a systematic basis. The application of these ideas yielded new theorems on the asymptotic expansion of Laplace integrals involving logarithms and exponential functions, as well as an elegant and unified treatment of Watson's lemma. Darboux's method, and the asymptotic behavior of functions in transition regions.

Erdélyi demonstrated that the Poincaré-type definition of an asymptotic expansion is much too narrow for a satisfactory discussion of the asymptotic behavior of functions depending on more than one parameter. These investigations of asymptotic analysis were influenced by the work then being undertaken in the Guggenheim Aeronautical Laboratory at Caltech on the development of an improved boundary-layer theory for viscous fluid-flow past obstacles, and Erdélyi's lifelong interest in singular perturbation theory can be traced back to this time. His book *Asymptotic Expansions* appeared in 1956 and is now regarded as one of the classic monographs on the subject of asymptotic analysis.

A third major area of Erdélyi's scientific work was in fractional integration and singular partial differential equations. His first major contribution to this area was in 1940, when together with H. Kober he introduced certain modifications of the Riemann-Liouville and Weyl fractional integrals and discussed their connection with the Hankel transform. These generalized fractional integration operators are now called Erdélyi'-Kober operators. These results lay dormant for over twenty years until Erdélyi's interest was revived by the publications of Alexander Weinstein on the generalized axially symmetric potential equation. Erdélyi's first paper on this equation appeared in 1956, giving criteria for the location of singularities of solutions, and it laid the foundation for numerous later developments in the analytic theory of partial differential equations. This paper was soon followed by many others on the axially symmetric potential equation and the Euler-Poisson-Darboux equation, as well as further applications of fractional integration to dual integral equations and the theory of generalized functions. He was actively involved with this work at the time of his death.

Arthur Erdélyi was an excellent expositor, and with his broad interests he had something to say in many areas of mathematics. His reputation was based on much more than his published papers, although this alone would have sufficed to make him one of the leading analysts of his time. His combination of mathematical scholarship, an interest and enthusiasm for mathematics, a

concern for younger workers, and a willingness to devote his time in aid of the mathematical community won Erdélyi the admiration and respect of an entire generation of mathematicians.

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