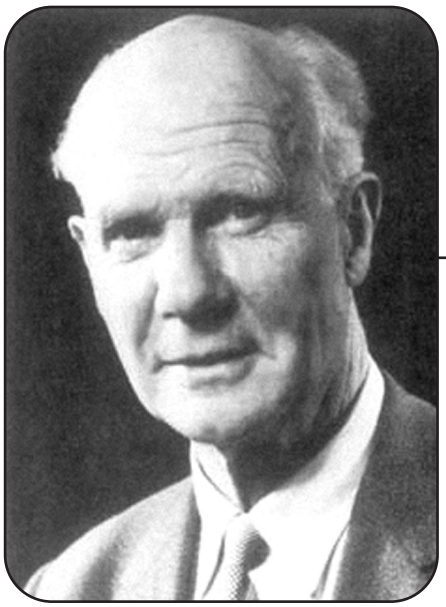

EGON S. **PEARSON**

By Herbert A. David

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Egon Sharpe Pearson was a long and leading figure on the world statistical scene and an honorary member of the American Statistical Association. He had been living in retirement in Sussex and, in spite of a heart condition, had been working on the history of statistics until a few months before his death in 1980.

Pearson was born in London at a time when his father, Karl Pearson, was putting forward his famous system of frequency curves. Educated at Winchester and at Trinity College, Cambridge, Egon Pearson's initial research was in solar physics. He joined Karl Pearson's department of applied statistics at University College London in 1921 and attended all of his father's lecture courses. In 1922 there began the stream of important publications that soon established the younger Pearson's reputation. When Karl Pearson retired in 1933 his department was split in two; Fisher was appointed Galton professor of eugenics and Pearson was appointed reader and then professor of statistics in 1935. With his father's death in 1936 Pearson assumed the editorship of *Biometrika*, retaining it until his retirement in 1966; he continued until 1975 as editor of *Biometrika* auxiliary publications.

Karl Pearson deeply influenced his son by force of example and by providing him with many of the tools for future work. Egon Pearson's statistical philosophy was shaped to a much greater extent by W.S. Gosset ("Student"), particularly by Gosset's pioneering work in small-sample theory, which was later put on a rigorous footing and much extended by R.A. Fisher. Pearson was excited by these developments with which his father never felt wholly comfortable. In the 1920s both Gosset and Pearson became concerned with the too-ready assumption of normality that followed Fisher's great success in development an elegant small-sample distribution theory under normality. As a result, Pearson developed a lifelong interest in what would now be termed robustness studies, with Tippett's random numbers providing the means for simulation until the computer could take over.

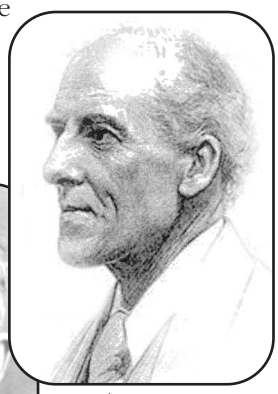
Also in the 1920s Pearson began the extraordinary 10-year collaboration with Jerzy Neyman for which both men are best known despite their numerous important individual contribu-

tions. The Neyman-Pearson theory of testing statistical hypotheses has become an integral part of every statistician's education and vocabulary. In 1928 the likelihood ratio criterion was put forward. No optimality was claimed, but the criterion was shown able to reproduce many existing tests and to provide appealing new ones. A major breakthrough occurred in 1933 with the optimality result that has become known as the Neyman-Pearson fundamental lemma. This settled the testing of a simple (i.e., fully specified) hypothesis against a simple alternative; later papers dealt with the more complicated situations arising when null and alternative hypotheses are not both simple. Pearson was the initiator of the partnership. Correspondence with Gosset, begun some six months before that with Neyman, shows, according to Pearson, that the concepts of the alternative hypotheses, two kinds of error, and use of the likelihood ratio principle to determine tests statistics were already formulated before being put to Neyman. The latter's contribution was absolutely essential, however, to give precision to Pearson's "loose ideas." Neyman provided mathematical refinement and generality, and took the lead in the pursuit of optimal approaches.

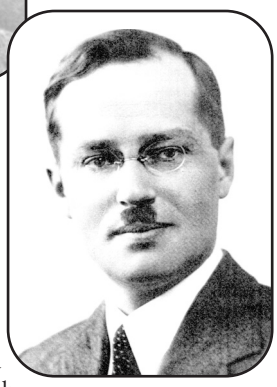
W.S. Gosset

Pearson managed to launch a second very successful collaboration, this time with H.O. Hartley. Toward the end of the 1930s he saw the need for a complete revision of Karl Pearson's two-volume *Tables for Statisticians and Biometricians*. Over the years new tables were computed by Pearson and Hartley, as well as others, to be collected in *Biometrika Tables for Statisticians* of which Volume 1 appeared in 1954 and Volume 2 in 1972. With their attractive layout, easy means for interpolation, and extensive, helpful introductory material, these tables have been widely recognized as models of their kind.

Endowed with a sense of history and an exceptionally lucid style, Pearson has contributed much to an understanding of issues in which he or his father were principals. His biographical accounts in the 1930s of Karl Pearson and Gosset are masterly. It appears however, to have required the prodding of M.G. Kendall to persuade Pearson to turn more systematically in later life to such historical writing. Some of this work was published in *Biometrika* in a still ongoing series of articles (by various authors) on the history of probability and statistics, a series that with Kendall's help was instituted by Pearson in 1955. In 1978 Pearson completed the editing of lectures, delivered by his father from 1921 to 1933, on the history of statistics in the 17th and 18th centuries. For about two years before his death in 1980, Pearson was engaged in editing a letter exchange between Gosset and Karl Pearson (1908-1935) and between Gosset and himself (1926-1937).



Karl Pearson



Jerzy Neyman

University College London was closed from 1939 to 1945 and Pearson, together with three members of his staff, constituted what was essentially an operations research group in the Ordnance Board, Ministry of Defense. In spite of bombings, V1 flying bombs, and V2 rockets, Pearson found this assignment, in a way a research job, "undeniably personally rather enjoyable." He had not been in active service during World War I because of a heart murmur, and the war work provided an escape from the heavy dual responsibility of running a department and editing *Biometrika*.

Pearson, who had none of his father's aggressiveness, suffered during the 1930s from the hostility of R.A. Fisher, who was on the floor above. Naturally there were jurisdictional problems regarding the scope of their two departments. Pearson, however, held most of Fisher's work in high regard and was able to write in later years that he had long gotten used to Fisher's never having mentioned his name in print! With Fisher safely in Cambridge, the earlier postwar years were rather pleasant. Students during this period found Pearson to be an unassuming man and his lectures the embodiment of common sense. He was always more concerned with the essential ideas and their application than with the mathematics, and would punctuate his presentation with a large number of illustrative charts. Even though he did not regard himself as made to be a department head, he managed to attract to his staff, for significant periods, such eminent people as Neyman, B.L. Welch, F.N. David, N.L. Johnson, and Hartley. The result was a very stimulating environment.

Egon Pearson

As editor of *Biometrika* Pearson established a reputation for fairness and promptness. He was helpful and constructive whenever possible and at times would become deeply involved with a submitted paper. One would never guess from his distinguished performance over a 30-year period that he regarded the editorship as a responsibility thrust upon him. Apparently he would have preferred to be left alone to get on with his own ideas.

Pearson was inevitably the recipient of many honors, including a C.B.E. for his contribution to the war effort, a term as President of the Royal Statistical Society, and election as Fellow of the Royal Society. Of most enduring significance, however, are the two volumes of Pearson's selected papers and his joint papers with Neyman, issued by the *Biometrika* trustees in 1966 to celebrate his 30 years as editor. He has put all statisticians in his debt. His modesty and warmth will always be cherished by his many friends. ■