

able scholarly undertaking of J. H. Bennett to assemble Fisher's writings in more accessible form, earlier works being five volumes of *Collected Papers* (University of Adelaide, 1971-74) and another volume of correspondence, *Natural Selection, Heredity and Eugenics: Selected Correspondence of R. A. Fisher with Leonard Darwin and Others* (Oxford University Press, 1983).

The present collection of statistical correspondence is organized into a long "chapter" on statistical inference (pp. 1-244), another substantial chapter on statistical theory and method (pp. 245-306), and a grab bag of short chapters on topics such as history, philosophy, teaching, and scientific research (pp. 307-360). The correspondence, arranged in each section alphabetically by name of correspondent, covers the full 40 years up to Fisher's death in 1962 but has only two main contributions from the 1920s and is weighted to the mid-1950s, when Fisher was preparing the short summing-up volume *Statistical Methods and Scientific Inference* that appeared in 1956.

Fisher's originality and genius sparked a major share of the statistical developments of the 20th century. His most productive period began in the 1910s with analytical representations of sampling distributions and continued through the 1920s with key conceptual and technical developments in estimation theory. The middle of the decade saw the publication of the first of many editions of the pathbreaking *Statistical Methods for Research Workers*. In parallel with these works, Fisher made major contributions to genetics, leading to the 1930 publication of *The Genetical Theory of Natural Selection*. The flow of innovative papers on statistical theory and methods continued through the 1930s and included the 1935 publication of *Design of Experiments*.

Although he was widely recognized and honored, for example by election to Royal Society fellowship in 1929, Fisher's career was marred by animosities directed at individuals who criticized him, often not understanding his radically new ideas. Frictions with Karl Pearson developed early and continued through Pearson's death despite wide acceptance of the merits of Fisher's positions. In the 1930s, Fisher increasingly interacted with the British-American school of mathematical statisticians who took his ideas as a starting point, and he became embroiled in bitter controversies, especially with theoreticians led by Jerzy Neyman, who in Fisher's eyes distorted his positions and substituted unsound and dangerous theories in place of his own. Fisher returned with vigor to statistical controversies in the 1950s but achieved quite limited success in persuading theorists to stay on his side. A few months

before his death, he would refer to "that darkest Continent, N. America!" (p. 215).

I find few important revelations in Fisher's letters, but there are many pungent statements of attitudes and positions that can deepen understanding of applied statistics and the logic of statistical inference, especially if read in conjunction with the well-signposted papers and books that Fisher was writing, revising, and discussing with friendly colleagues. Along with having direct teaching value, the letters will be an enormous resource as statisticians and other scholars increasingly seek to research, revalue, and place in scientific context the development of 20th-century statistics. It is never too soon to start, but the dust has not entirely settled on the arguments of 35 years ago, and it is only in recent years that we have achieved balanced views of the period up to 1900 in distinguished books by Theodore Porter (*The Rise of Statistical Thinking*, Princeton University Press, 1986) and Stephen Stigler (*The History of Statistics*, Harvard University Press, 1986).

The most prominent themes throughout the letters concern the gradual evolution of Fisher's thought on probability and related concepts of what he called the logic of uncertain inference. Large fractions of the text are devoted to lengthy exchanges with H. Jeffreys (9% of the text) in the 1930s, French colleagues G. Darmon (4%) and M. Fréchet (7%) centering on 1940, and British colleagues G. A. Barnard (12%) and D. J. Finney (6%) over the final 15 years but peaking in the mid-1950s. The exchanges with N. Campbell in 1922 give a look at Fisher's early, mainly frequency-based ideas on probability. The long series with Bayesian geophysicist Jeffreys says much about both men and may be the most important part of the book, including Fisher's interpretation of Bayes's prior probability as "a value averaged over objective frequencies" (p. 167), which was not accepted, or perhaps understood, by Jeffreys, and containing illuminating discussions of Laplace's concept of "equally possible" cases and Fisher's concept of a "hypothetical infinite population." Fisher put much effort into elaborating his "fiducial argument" and distinguishing its logic from the simpler Neymanian concept of confidence limits that developed from the earliest of Fisher's writing on fiducial intervals. Technical aspects of the fiducial method were discussed in correspondence with D. A. S. Fraser, L. J. Savage, and J. W. Tukey, occupying 10 to 13 pages each in this volume, and are reflected in many of the other letters in the long chapter 1.

Fisher was broad in his outlook toward probability and came to regard fiducial probability as very much in the spirit of

classical writers such as Bayes. He did not oppose Keynes's "measure of rational belief" interpretation, which he called "penetrating" and "needed" (p. 56), but he regarded it as too all-embracing and attempted to formulate a system of logical varieties appropriate to varying circumstances. The interpretation of significance tests and the explanation of concepts related to likelihood are frequently discussed in the letters.

I am slighting in this review the many illustrations of practical statistical thinking that Fisher generously provided in response to inquiries from far and wide. The correspondence shows little of the irascible nature that made Fisher's jousts with opponents in published discussions famous. He is mainly polite and occasionally shows a jocular and fun-loving side. He was barely tolerant of able young statisticians such as M. S. Bartlett, S. S. Wilks, and J. Wishart, whom he would berate, I believe unfairly, in the early 1930s, suggesting they had not read his original papers when they attempted alternative derivations and elaborations of his models. Fisher did not always attempt to follow the technical arguments that correspondents bounced off him, even when they nominally concerned his own fundamental principles, being more concerned to repeat and polish his own formulations. And for this concern subsequent generations will be grateful, for Fisher expresses deep ideas with brevity and penetration. Although they do not make easy reading, the effort of following his arguments is always repaid.

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