Shorack GR, Wellner JA: *Empirical processes with applications to statistics.* Wiley Series in Probability and Mathematical Statistics, Wiley, New York 1986, XXXVIII + 938 pp, $ 59.95.

This encyclopaedic masterpiece fills a gap that was perhaps the widest in the literature of Probability and Statistics. It is the first comprehensive work which covers the whole breadth and depth of the theory of empirical processes based on independent real random variables with wide-ranging applications to the statistical theories of non-parametric estimation and hypothesis testing. Therefore it is of great importance both for statisticians who want to see and understand what is the probabilistic theory underlying many of the procedures they use and for probabilists interested in the statistical motivation for many of the theories they work on. These two aspects are very nicely blended in the book, which is designed to be a basic reference for research workers and a basic textbook for graduate students. This double aim has been fully achieved and hence it is easy to foretell that the book will be doing good service in both of its qualities for decades to come.

The first five chapters present the basic unified weak convergence theory of general weighted empirical processes based on a triangular array, the associated rank processes and corresponding reduced quantile processes, empirical processes of residuals in a linear model, stochastic integral processes, and supremum and L^2 functionals of these processes with various applications to testing and estimation. The approach to weak convergence is the constructional one based on the Skorohod-Dudley-Wichura theorem. The next two chapters and Appendix B are on the martingale-counting process weak convergence techniques as applied to the product-limit estimator based on randomly censored data. Chapters 8 and 9 are on Poisson representations and the exact distribution theory of functionals of the empirical distribution function G_n of Uniform (0, 1) variables. Then two chapters deal with linear or almost linear bounds for G_n and its inverse G_n^{-1} and with the weak convergence of the uniform empirical and quantile processes $U_n(t) = \sqrt{n}(G_n(t) - t)$ and $V_n(t) = \sqrt{n}(G_n^{-1}(t) - t)$, $0 \leqslant t \leqslant 1$, in weighted supremum metrics. Chapters 12–15 are devoted to the almost sure behaviour of U_n, V_n and $U_n + V_n$, and the next three chapters to the standardized U_n and V_n, to U_n indexed by functions and to the general quantile process. Then three chapters present applications to L-statistics, rank statistics and spacings, while the next two to problems under symmetry and to reliability, econometric and U-statistic empirical processes and the bootstrap. A short chapter follows on large deviation and Bahadur efficiency and the next one is about empirical processes of non-identically distributed random variables. The final Chapter 26 is a short glance into the convergence theory of empirical processes on general state spaces, expounded in much more detail in three recent monographs by P. Gaenssler, R. M. Dudley and D. Pollard. Appendix A is a very skillfully compiled collection of inequalities and other miscellanea.

This short list is, of course, just to poorly indicate the scope: only the table of contents takes 18 pages in the book. The number of misprints and inaccuracies I