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REVIEW

Statistical Models and Turbulence. Edited by M. ROSENBLATT & C. VAN ATTA. Springer-Verlag, 1972. 492 pp. DM 28.

The book is the proceedings of a symposium arranged by the Institute for the Application of Statistics in the Physical Sciences (a section of the International Statistical Institute) and held at the University of California at San Diego from 15 to 21 July 1971. ISI unites the experts in the field of mathematical statistics and probability theory, and the idea of the meeting was to gather the probability theory people and turbulence people for mutual discussions and exchange of information. The idea was not realized successfully enough: most of the papers in the volume are interesting either only to research workers in turbulence or only to experts in probability theory and statistics, and I also know that there was not much exchange of information between the two groups in the breaks between the sessions. However the meeting collected many first-rate scientists, and the volume is quite an important contribution to the literature on turbulence. Its significance for probability theory is less evident, though the book contains good surveys by M. Rosenblatt on probability limit theory for stochastic process and by E. Parzen on recent developments in time-series analysis, and valuable mathematical research papers by G. Kallianpur and E. J. Hannan.

I think that the idea of uniting in one room experts in probability and turbulence mechanics is nevertheless a good one and deserves further attempts to be realized in spite of the limited success of this meeting. Therefore I want to mention especially a few papers in the volume which are of considerable interest to both the mathematical and mechanical people: J. L. Lumley on applications of central limit theorems to turbulence problems; J. M. Burgers on some questions connected with the model equation to which has name is attached; K. M. Case on topics related to this equation; D. Ruelle on a sophisticated mathematical description of transition to turbulence; S. Corrsin on a random geometrical problem suggested by turbulence; and B. B. Mandelbrot on possible mathematical refinement of the lognormal third Kolmogorov similarity hypothesis. All the other papers that are not purely mathematical are typical turbulence research papers of a rather high level. Some of them I want to mention especially (this selection is of course quite subjective): S. A. Orszag & G. S. Patterson on numerical simulation of isotropic turbulence; J. R. Herring & R. H. Kraichnan on comparison of the corollaries from different closure approximations for isotropic turbulence with the data of laboratory and computer experiments; T. S. Lundgren on a closure hypothesis of the hierarchy of equations for the turbulent probability density functions, which allows the inertial subrange in the turbulence spectrum to be obtained and the Kolmogorov constant to be evaluated approximately; and three papers (by J. C. Wyngaard & Y. H. Pao, C. Van Atta & J. Park and C. H.

Gibson & P. J. Masiello) on careful experimental investigations of the structure and intermittency of the turbulence in the dissipation subrange. (Further recent contributions to this latter topic by M. Kholmyanskii in *Atmosph. and Oceanic Phys.* **9**, 1973, 801 and by C. W. Van Atta & T. T. Yeh in *J. Fluid Mech.* **59**, 1973, 537 contain additional riddles to be solved by researchers.)

Now for the last but not the least comment on the volume. At first sight the book appears to be a poor piece of polygraphy; but it is in fact a paper-bound collection of the copied typescripts, with each paper being in its own style of type, the equations partially handwritten and partially typewritten, the figures placed at the end of each paper, etc. However, there are practically no misprints in the volume and the print is sufficiently clear and easy to read in all the papers. Moreover it is quite important that the volume was published only half a year after the symposium and that the price of the volume is comparatively low on today's Western standards. These facts increase significantly the value of the book for the scientific community.

A. M. YAGLOM