SPATIAL PROCESSES: MODELS & APPLICATIONS.

By A. D. Cliff and J. K. Ord. Pion, London; distributed by Methuen, New York. $30.00. xii + 266 p.; ill.; index. 1981.

The analysis of the arrangement of data in space and time is a subject with applications in such diverse biological areas as ecology, epidemiology, animal behavior, population genetics, and oceanology. This book incorporates the authors' 1973 work, *Spatial Autocorrelation,* and also contains some 120 pages of new material on this subject. Except for Chapters 2 and 6, the level of presentation requires no more statistical sophistication than does Pielou's *Mathematical Ecology* (Wiley, 1977).

The chapters from the author's earlier work, which introduce the various autocorrelation statistics, discuss distribution theory, and deal with the use of the statistics to analyze both raw data and regression residuals, are substantially unchanged and will not be treated further here.

Both quadrat and nearest-neighbor analyses of point patterns are discussed in Chapter 4. A summary of a technique for generating maximum-likelihood maps of the intensity of a variable-intensity Poisson process is given. Chapter 5, which is of particular interest to biological and other researchers, introduces the spatial correlogram and discusses related descriptive techniques. Kooijam's method (see *Ann. Syst. Res.*, 5:113–132, 1976) allows one, after assigning distance classes, to calculate those weights which result in a maximal I statistic. Kooijman furnishes the first four moments of this statistic, so that it may be used as an overall test of spatial dependence. Further, the values of the weights furnish information on the nature of this dependence. Greig-Smith's technique (see *Quantitative Plant Ecology*, Butterworth, 1964) for analyzing the scale of variation is discussed in a two-dimensional context, and is further extended to deal with covariance between two spatial variables.

In Chapter 6, autoregressive, moving average, and other models of spatial data are considered. OLS estimates are unbiased and consistent for the parameters of the "conditional" AR model. In this model, the expected value of the i^{th} observation, conditional upon the other observations, is a linear combination of the other observations. Unfortunately many other equally attractive models exist, and, for these, easy methods of parameter estimation are available only in restricted cases.

Chapter 7 deals with hypothesis-testing when data are autocorrelated. In this situation, the classical assumption of independent observations is broken, and standard statistical analyses are inappropriate. Positive autocorrelation causes Student's t-test to be nonconservative, and causes overestimation of the significance of the correlation between two surfaces. Similarly, positive autocorrelation in regression errors causes an inflated F-statistic. Modified t-test and ANOVA techniques are discussed. In Chapter 9, regressive-autoregressive models are considered briefly.

This book is commendable for its wealth of examples drawn from epidemiology, ecology, sociology, and elsewhere. For this reason, and because of the techniques discussed, it should prove a useful reference to researchers with some statistical exposure.

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MOLECULAR ELECTRO-OPTICS. *Electro-Optic Properties of Macromolecules and Colloids in Solution. Proceedings of a NATO Advanced Study Institute on Molecular Electro-Optics held July 14–4, 1980, at Rensselaer Polytechnic Institute, Troy, New York. NATO Advanced Study Institues Series, Series B: Physics, Volume 64.*

Edited by Sonja Krause. Plenum Press, New York. $59.50. viii + 520 p.; ill.; index. 1981.

The 23 chapters in this book average somewhat less than 25 pages each and are of uniformly high quality. In spite of the stated intent of the authors to present reviews, rather than original work, many of the figures and tables appear to have been made especially for this presentation. Thus, this book contains much material that is useful and not obtainable elsewhere in as convenient a form.

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ENGLISH-RUSSIAN BIOLOGICAL DICTIONARY. *Fourth Edition (about 60,000 terms).*

Edited by O. I. Chibisova and L. A. Koziar. Published for 'Russky yazyk' Publishers (Russian Language Publishers), Moscow, by Pergamon Press, Oxford and New York. $120.00. 736 p.; no index. [Originally published in 1976 by Russian Language Publishers, Moscow.] 1979.

This is an English edition of a dictionary which was originally published in the Soviet Union in 1976. The dictionary is authored by a group of about 25 biologists and is a very useful reference containing about 60,000 terms. It is not going to be a bestseller in the U.S. because, as far as I know, very few biologists are attempting to translate their work into Russian. It is useless for reading Russian literature because it is only a one-way dictionary. I believe we would benefit much more from a Russian-English dictionary.