

social services will become prohibitive, especially if they are based on number of children. Richard Meier, in his book *MODERN SCIENCE AND THE HUMAN FERTILITY PROBLEM*, has used Mauritius as a cautionary example of a society with unchecked population growth, and Titmuss uses his description to great advantage. Nevertheless, he realizes the likelihood of opposition; he hopes, however, that it can be overcome. In this respect, the tenor of both reports is the same in that they hope that reason will prevail in problems of an intricate social, cultural, political and motivational context. A part of the summary states this view, which can be applied to all the proposals:

Under certain conditions—and admittedly very stern conditions—the challenge of over-population could, in one generation, be largely overcome. Already certain countries, for example Japan and Puerto Rico—are showing the way. With its relatively small size, ease of communication, educational provisions and other advantages, Mauritius could soon begin to rival them. It could set an example to the poorer countries of the world. It could make its own contribution towards solving the great problem of poverty.

We do not think that a purely negative approach to this question of family limitation would by itself have much appeal. It has to be seen and understood in the whole context of social and economic advance. (p. 241)

Unfortunately, these hopes have so far not been borne out. On account of public reactions, the 1960 legislature postponed *sine die* a discussion on a program for family limitation.

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STATISTICAL GEOGRAPHY¹

THIS generally excellent presentation is advertised as “a handbook without parallel for social scientists concerned with areal analysis.” This is a reasonable claim because it is

¹ Duncan O. D.; Cuzzort, R. P.; Duncan, B.: *STATISTICAL GEOGRAPHY: PROBLEMS IN ANALYZING AREAL DATA*. Glencoe, Illinois: The Free Press, 1961. 191 pp.

literally the first such exposition to attempt a survey of the entire store of tools at hand. Even so, the presentation is incomplete. During the time it apparently was in press, significant contributions were made and gains consolidated.

Professional practice in geography and related disciplines has resulted in an unduly long barren period between the two world wars—a time during which virtually no attention was paid to the particular theoretical and methodological problems now deemed so important in this work. It would seem that this certainly is not unrelated to the fact that geography has lost its prominent position in the curricula of certain leading academic institutions.

The current awakening in the subject and the merged interests of sociologists, geographers, regional scientists and others have brought such a large and continuing flow of important contributions that whosoever would at any time now attempt to assay the field can hope only to provide a summary to that date, to point out trends, and to identify “problems which seemingly need to be solved” before a definitive textbook or manual for the analysis of areal data can be offered. This is precisely the attitude the authors have assumed, with excellent results.

A quite original contribution can afford to be “locked up” for a fairly long time in press. Not so, however, for any work which is substantially a summary or review inventory as is *Statistical Geography*. An examination of the bibliography of this work is revealing. Of the 148 items cited, only 16 predate World War II, with a large number of these only tangentially related to the subject matter here. The quickening pace of pertinent publications since World War II is faithfully reflected by the bibliography at least until 1957. For that year there is the maximum number of 26 works cited. However, despite the fact that recently the pace has been even further accelerated, Duncan, Cuzzort and Duncan list only 11 items for 1958, six for 1959, and one for 1960. The 1960 item is a product of one of the authors, and hence accessible to him before its publication date. In reality, 1957 should not be considered a peak

year. Certainly each year since has produced even more significant works although, of course, this is largely a matter of individual opinion at this early date.

Despite the fact, then, that this work seems even now seriously limited and outdated, there is much of considerable value to be studied carefully and appreciated. For example, an intriguing presentation and explanation of the effects of the differences in the sizes of areal units upon measurement, certain kinds of correlation, and inferences is offered. Here the problems arising from the fact that many computed measures are not parametric to the actual areal distributions but rather to the arbitrary system of areal subdivision employed are investigated. Unfortunately, the authors were not able to (or did not) present pertinent very recent (and earlier) findings based on spatially continuous variables which help to overcome many of the difficulties they see as due somehow to the inherent nature of the data to be considered. In particular, they have neglected the means of measuring the degree of areal association of two discrete populations when macroscopic spatially continuous point "accessibility" values are used rather than more microscopic, arbitrary areal "density" values which in the limit are meaningless. It is therefore regrettable that the authors further endorse the frequently quoted but misleading statement that every change in scale (taken here to mean change in the size and hence number of areal subdivisions considered as basic units of association with no change in the total universe area) "will bring about the statement of a new problem, and there is no basis for presuming that associations existing at one scale will also exist at another." In light of recent developments, to continue research in these terms of "areal levels of generalization" is no longer nearly so relevant and, in fact, can be quite misleading.

An intriguing presentation of the nature of, and the means of capitalizing on the oftentimes apparent inconsistencies resulting from the temporal and areal analyses of comparable data is offered. To this reviewer, the discussion of the temporal

aspects of areal variation comprises the high point of the book despite a minor irritation resulting from the fact that the authors lend additional currency to the use of the term "longitudinal" in the manner of social scientists which, to the geographer, seems most charitably described as peculiar.

Of approximately equally high calibre is the recurring consideration throughout of the problems associated with the attempts to make inferences concerning individuals in areas when all that are available as variables are averages or proportions for populations in areas. However, no definitive statements of the means of establishing limits are included by the authors.

Routine, but very careful, consideration of the types and the quality of areal data encompass a discussion in which areal units are considered as collections, segments of space, locations, members of a set, and in relation to other units in a spatial context. In this last connection, a potential-of-population map (one of only three maps in the entire book!) for the United States in 1950 is presented. Although this map is generally accurate, impossible bends in contours are displayed apparently because the authors interpolated "rigorously" but not logically among the control point values obtained by summation. While such a summation or mechanical integration is, in practice, necessary to obtain approximate values of potential at various places over an area, it should never be lost sight of that what is being approximated is a definite integral and hence a spatially continuous quantity with an associated continuous gradient as a first derivative. In addition, non-urban values of potential can and should be shown to rise far higher in New Jersey, for instance, than indicated on this particular map despite the excuse that it fails to show details accurately in the vicinity of large urban centers.

While the distinctions in the analysis of areal data as measurement of areal distributions, analysis of spatial structure, and the explanation of areal variation may have a certain validity based on the traditions of academic disciplines, the

continuation of these divisions seems no longer defensible with regard to the now frequent and fortunate crossing of disciplinary boundaries by researchers, and especially in light of geography's recent emergence from its restrictive shell. However, the authors, themselves, it would seem, recognize the virtual inseparability of these considerations. Their apologies for having "trespassed" by presenting this book, while graciously intended, really seem unnecessary.

Especially enlightening is the discussion of so-called "regional differences" as nothing more than "unexplained" or residual variation in contrast to common parlance (and professional shortcuts) where we often speak of "regions" as constituting an influence on social and economic phenomena. Rather than recognizing regions as a cause of areal variation we must look on them as the consequence, or perhaps better as the generalized areal presentation of the results of the interplay of phenomena.

Throughout the entire work, correlation and regression coefficients based on least squares methods are employed. It is assumed that the reader is thoroughly familiar with the elements of conventional statistics, but some consideration is given to the establishment of appropriate tests of significance for areal data suggestive of the problems in auto-correlation for time series.

If another edition of this book is to be forthcoming, or if someone else undertakes to present "a handbook without parallel for social scientists concerned with areal analysis," it is hoped that there will be included a number of additional things not presented here. Especially desirable would be a discussion of the entire range of ideas associated with the computation of the various spatial moments for an areally distributed population. From such computations of moments arise measures of various centers; measures of dispersion, both particular and general; and indices of skewness and kurtosis for areally distributed populations. For actual population distributions over very large areas on the earth's surface, the sphericity of the

earth may also need to be considered. Just as the normal "curve" is a standard in conventional statistics, so too can "surfaces" be employed for areal distributions including both density and probability types. A discussion of the nature and significance of basic and derived quantities, degrees of freedom, and the level of abstraction seems necessary, including the statement of the roles of discrete and continuous variables with emphasis upon the distinction between *smooth* and *smoothed* distributions. One would like also a more adequate indication of some of the more important substantive results already achieved in statistical geography.

Despite the many reservations he has expressed, this reviewer finds this book extremely valuable and unhesitatingly suggests that, for the time being, it be made required reading not only for those whose professional pursuits are especially closely linked to areal distributions, but also for all social scientists.

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NEGROES AND PUERTO RICANS IN THE NEW YORK METROPOLITAN REGION

OSCAR Handlin's small book¹ is the third of a series of volumes from the New York Metropolitan Region Study. An historian, the author has provided a broad historical setting of successive immigrant stocks in New York City. A century ago the Irish were the newcomers. Later, the various nationality groups from Eastern and Southern Europe were the slum dwellers. After World War I the Negroes from the South began flocking to New York, and since World War II the Puerto Ricans have appeared in increasing numbers. The author indicates that each group in turn was viewed with alarm. Although this backdrop probably provides little comfort to the city fathers worried about problems of juvenile de-

¹ Handlin, O.: *THE NEWCOMERS: NEGROES AND PUERTO RICANS IN A CHANGING METROPOLIS*. Cambridge, Harvard University Press, 1959. 171 pp.