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The delineation of the system of State economic areas developed out of the need to devise tabulation areas larger than counties but smaller than States for the migration data of the 1950 Census. Multi-county areas for migration data had been prepared for the 1940 Census by the then prominent geographer and demographer, O.E. Baker. However, because of the intervention of World War II, the 5-year interval migration data of the 1940 Census were neither published nor tabulated, although they were card punched.

In 1949, Donald Bogue of the Scripps Foundation headed a successful effort to salvage these data before the cards were destroyed. But, in connection with the 1950 Census it was decided not to use Baker's areas. Baker -- who had recently died -- probably had known as much as anyone about the regions of the United States. However, there was little information available about the basis of delineation of his areas. Furthermore, since 1940, the Standard Metropolitan Area system had been adopted and generalized to county lines outside of New England. These circumstances led to a decision to re-delineate the nonmetropolitan part of the Nation, using more systematic procedures than those under which Baker's areas were produced, and to use such areas with the SMA's as migration measurement units. Bogue got the assignment.

In the early stages of this work, it became apparent that the Agriculture Division of the Bureau of the Census desired a system of multicounty units for cross tabulations of the 1950 Agriculture Census. The Department of Agriculture had a set of type-of-farming areas available, but they were far too variable in size and consistency from State to State to be suitable. It was demonstrated that a general purpose set of economic units would be superior to the typeof-farming areas for agricultural tabulations even though not delineated solely on the basis of agricultural considerations. Thus, the system of State economic areas was prepared for use in the Censuses of Population, Housing, and Agriculture, with some subdivisions of areas for agricultural purposes being made that were not to be recognized in other tabulations. Program requirements made it necessary that standards of minimum population size and number of farms be observed wherever feasible to permit reliable tabulation of sample statistics, but that the total number of areas be kept within bounds to limit costs of presentation. In general, we endeavored to include at least 100,000 persons in each population-housing area, (although some exceptions were made) and 10,000 farms in each agricultural area (again with some exceptions in practice).

The nonmetropolitan economic areas were designed to be areas of relative homogeneity of resources, economic activity, geographic factors, population and social characteristics, rather than integrated, nodal areas. They were essentially production areas rather than marketing, commuting, or service areas. This is a major feature distinguishing them from the functional economic areas now being developed. The areas were based on social as well as economic criteria. Measures such as race, fertility, infant mortality, cultural history, and housing conditions were used in their delineation, but the intellectual climate of the time did not permit them to be called socio-economic areas.

The areas were announced in 1950 after a fairly extensive review procedure which included consultants in every State. A bulletin was published by the Census Bureau showing the boundaries and giving a number of statistics for the areas. Narrative descriptions of the character and identity of each area together with names for them, were not published until 1961 when the book, <u>Economic Areas of the United States</u>, by Bogue and myself appeared. The areas were not controlled by the Budget Bureau or officially designated by that agency as the Standard Metropolitan Areas were.

From the 1950 Censuses, reports were issued by economic areas (or subregional combinations) showing migration, rural housing, and agricultural data that were not also available for counties. The agricultural census use was repeated in 1954. In the 1960 Census, much more extensive migration materials on the SEA basis appeared and the rural housing report was repeated and improved. The reports of this Census also include a valuable compilation of base data by SEA's, but these figures are summations of county-level statistics and carry no new detail for SEA's. Under a project headed by Donald Bogue, special cross-tabulations of population data from the 1960 Census have been made by SEA's and are to be published by him in 1968. In the Agriculture Census of 1959, a subregional level of detail was substituted for the full set of State areas, and the data were not published but simply distributed to some interested users. Thus far, this is also the procedure used in the 1964 Census of Agriculture.

Use of the concept and of data based on it. -- Considerable use has been made (1) of the State economic area census data, (2) of the SEA's as a means of grouping data for analysis, and (3) of SEA's as sampling universes for surveys. The Department of Agriculture has probably been the major single adopter of the system. USDA has computed major statistical series by SEA's on population migration, replacement measures for persons of working age, and farm level-of-living indexes, in addition to numerous studies in the field of agricultural economics. No systematic effort has been made to identify or count all of the uses made of the SEA system. I have encountered many uses of the concept in such a chance and unexpected way that I believe most of the use outside of the Department of Agriculture has

not come to my attention and is not susceptible to complete compilation.

When I am asked whether I think that the system and data based on it have been satisfactory for most uses or adequately used in regard to the Census resources put into them, I find it difficult to give a categorical reply. There is an obvious need for a set of areas between the State and county level. Yet an almost infinite number of best areas could be devised for the infinite number of special uses and definitions desired. Area delineation is basically a "to each his own" proposition. Whether or not the SEA system has been used sufficiently is probably answerable only in terms of whether any other system would have been used to a greater extent, and in the absence of another existing system the question remains.

The discussants on the session at which this paper is being given illustrate two levels of criticism that have been directed to the SEA system. Otis Dudley Duncan has expressed the view that the "...agricultural tail was allowed to wag the Census dog in the organization of the SEA system". 1/ The authors of the system certainly tried not to do this, even though one of the purposes for which the areas were intended was agricultural analysis. Considerable weight was given to the major economic activity of the county groupings irrespective of whether or not this activity was farming. But Duncan's opinion is a matter of judgment and clearly an analyst of nonagricultural data might decide not to use the system if he felt it to be overly agricultural.

A second form of criticism is the flat assertion, made several times in recent years by Karl Fox, that the areas have "...been almost totally useless to social scientists". 2/ This is simply not correct, and would seem to reflect either a lack of acquaintance with the relevant literature or an implication that those who have employed the SFA's are not really social scientists. I am not sure which is the greater sin. But the assertion has been made sufficiently often in connection with the campaign for functional economic areas that some comment on the extent and variety of use of the SFA system is necessary.

One of the early uses of the SEA's was for a study of juvenile delinquency and dependency in Iowa. The author of the study (a professor then as now in the department of which Dr. Fox has long been head) commented "We have found (the economic areas methodology) much better than any other method known to us". 3/

In the late 1950's, Allan Beegle and Leo Schnore concluded in a "Memorandum on State Economic Areas" that "In general, State Economic Areas appear to serve the main purpose for which they were designed...." 4/ In 1958, I compiled a list of more than 50 demographic studies alone in which the system of State economic areas had been used. Of particular interest in judging the usefulness of the system to demographers was the fact that <u>every</u> study on the list had required either collection of original data or summation of county data by the authors. None were based on analysis of previously published SEA data, for practically no such data came out of the 1950 Population Census.

In 1964, I compiled an illustrative list of about 80 items that had appeared since 1958, largely demographic and economic (but again with no pretension of completeness). Shryock at this time concluded that "...various exhibits seem to me to demonstrate fairly extensive use of SEA's, in view of the fact that this Bureau has not really published a great many kinds of data for them". 5/

For more current usage -- and in the absence of comprehensive lists -- I should like simply to mention three recent publications. Each has come across my desk quite by chance within the 6 weeks prior to writing this paper, and each represents a different type of use of the SEA system. The first is an article by David Heer of Harvard University on <u>Negro-White Marriage</u> in the United States . 6/ In the study, Heer grouped data on Negro-white intermarriage by State economic areas in California, and then analyzed actual and statistically expected intermarriage percentages for each area. This is an example of the use of the system to aggregate data for meaningful areas where county frequencies are too small for analysis.

A second example is <u>An Exploratory Analysis of</u> the Roles and Role Conflicts of Vocational <u>Teachers in Oklahoma</u>, by Solomon Sutker and associates. <u>7</u>/ In this work, the State economic areas were used for stratification purposes in the selection of a sample of high schools for study.

A third instance is the recent issuance by North Dakota State University, of a series of circulars on <u>Crop Costs and Returns</u>. 8/ A separate circular has been issued for each economic area in the State. The circulars are essentially work sheets on which the individual farmer can compare his production inputs and labor-management returns, crop by crop, with the usual costs and returns that research has revealed currently pertain for his economic area.

My own view is that the use and usefulness of the State economic areas has been neither exceptionally good nor poor. Personally, I like the system best in the South and Border regions, where a combination of small counties, and sharp changes in physical geography and cultural zones permit delineation of areas with a higher and clearer degree of interareal variation and internal meaning than is possible in some other parts of the nation. Because they consist of county building blocks, the utility of the SEA's is somewhat limited in some of the Western States where population is low and where individual counties are typically too large in area to be relatively homogeneous. But this problem occurs with any county-unit system.

I firmly believe that the areas would have received greater use if the Census Bureau had consented to name them. Although metropolitan areas have always been named. the published Census data for SEA's have been burdened with the mask of numerical anonymity. What does it mean to anyone but the constant user of the system to speak of Nebraska Area 1, West Virginia Area 4, or Texas Area 15? One can much more readily place and visualize data for the Nebraska Sand Hills, the West Virginia Southern Coal Fields, or the Lower Rio Grande Valley. Bogue and I, together with Shryock and Brunsman of the Census Bureau, made a strong plea in 1959 that names (as well as numbers) be employed in the 1960 Census publications, but without effect.

Another distinction between the status accorded the State economic areas and the standard metropolitan areas, is the fact that the metro areas are labeled as "standard" and are controlled and announced by the Bureau of the Budget. Such a designation both engenders and effectively forces greater use of a system. But Budget Bureau designation is anything but an unmixed blessing for an areal system in which statisticians or other researchers have an interest. It subjects a system to constant lobbying and political pressure over boundaries, wherever economic rewards are at stake -- if we can judge from the experience of the metropolitan areas. And the Budget Bureau is not always able to resist pressure for changes that constitute a violation of proclaimed standards, if the requests have sufficient political clout behind them.

The future.--What would we do differently if the areas were being delineated for the first time today, rather than in 1949? Obviously one great difference in the state of the arts is the availability of the computer. It would be practical to consider additional quantifiable variables and to engage systematically in formal tests of adherence to homogeneity or goodness of fit criteria (although such tests are in my opinion, often of more theoretical than real importance).

But perhaps a more crucial question is whether so-called uniform or homogeneous areas would be used again. The 1960 Census made it possible for the first time to seriously consider delineation of job commuting areas. The temptation would have been great, had such data been available in 1949, to forget horizontal similarity and go for vertical integration. Also, it must be recognized that with the decline in primary-industry employment since 1949, the great improvement in highways, and the corresponding extension of commuting zones, the relative logic of integrated commuting areas and interest in them is greater today than earlier. Although the principal proponents of integrated or so-called "functional" economic areas seem to feel it necessary in the advocacy of that system to disparage the State economic area system, I feel no reciprocal antipathy toward the functional approach. I do think there are surprisingly grave defects in the first version of a national functional area delineation submitted to the Budget Bureau earlier this year (1967). But the notion is a logical extension of the metropolitan area system and properly

claims a place in the spectrum of area systems.

Must one system preclude the use of the other? I say no. They are not based on the same premises; they are not necessarily in conflict. The need to examine both the horizontal and vertical features of the spatial arrangement and organization of our society needs no defense. Each has its superior uses. This conclusion may come as bad news to the Bureau of the Census, of course, which is faced with the chore of identifying and providing at least minimal tabulations for as many systems of classification as it adopts.

The statistician's stake in the continuation of the SEA system in the population census is not tremendous, except in the case of migration data. Indeed, one of the criticisms made by Duncan in the 1950's was the fact that there had not been programs of cross-tabulation at the SEA level of data that were not otherwise available at the county level. But I think it essential that the 1965-70 migration tabulations be made by the SEA classification, both because of the need for time series comparison with the 1955-60 material and because I consider the SEA's to be superior to functional economic areas as units of migration analysis.

Functional areas tend to merge and obscure the common outmigration pattern of most hinterlands with the immigration of the central and suburban counties, without there being any functional relationship between the two. For example, the Northern Blackland of Texas has three metropolitan areas within it -- Dallas, Waco, and Austin, of which Dallas in particular is a city of heavy inmigration. The nonmetropolitan part of the Blackland (Texas Area 8) is an area of net outmigration, but despite the proximity and dominance of the three cities mentioned, only a fourth of the gross outmovement from Area 8 went to those metropolitan areas from 1955 to 1960. On a functional economic area grouping, this coexistent condition of immigration and outmigration would be masked by the inclusion of the hinterland counties with the functional centers. We would know less rather than more about migration patterns. But the State economic area system segregates the migration patterns more meaningfully.

A similar instance is Memphis. Shelby County is an area of net inmigration. The functionally related counties around it are all areas of net outmigration. But do the people from the surrounding counties seek Memphis as the primary destination? No, less than 15 percent of migration from the nonmetropolitan State economic areas contiguous to Memphis went to Shelby County from 1955 to 1960. From such considerations, as well as from the fact that we have not had consecutively comparable migration figures from any two of the last three censuses, it is my strong conviction that the basic unit of tabulation for streams of migration in 1970 should continue to be the State economic area. I am in favor, how-ever, of identifying the 1965 <u>county</u> of origin on the basic tape so that special tabulations of data by combinations of counties other than SEA's would be feasible. This was not done in 1960.

In sum, the State economic area system has its advocates and satisfied users and it has its detractors and nonusers. It probably has not had as extensive a place in the statistical program of its sponsor, the Bureau of the Census, as was generally envisioned at the time of delineation. The general use of data based on the areas would be facilitated if the Bureau of the Census would employ names for them. Principal adoption of the system has come in demographic and agricultural research, although by no means to the exclusion of use in other fields. In recent years, interest in nodal areas -- especially those reflecting work commuting patterns -has risen more rapidly than interest in areas of comparative homogeneity. These differently premised area systems serve different uses and properly should not be viewed as duplicative or competitive. The conclusion is offered that so far as data of the Bureau of the Census are concerned, the State economic areas are especially useful for tabulation of streams of migration. This quality is enhanced by the opportunity through continued use of SEA's in 1970 to compare migration streams with those of the recent past.

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