General sessions were held each morning to discuss general interest topics such as map models, map design and map generalization, as well as specialized cartographic applications.

MORTON A. MEYER, chief of the Census Bureau's Geography Division, discussed "A Geographic and Cartographic Program for the 1980 Census." To assign correct geographic identifications to the data provided from the major demographic and economic censuses is no small task. It requires accurate boundary information, up-to-date maps and effective data handling techniques. These requirements are met in part by the Bureau's Annual Boundary and Annexation Survey, the Metropolitan Map Series, and the GBF/DIME System. The Census Bureau is also exploring new techniques to facilitate the massive production requirements of the 1980 census and new mapping techniques to graphically illustrate the highlights of census statistical products.

GEORGE JENKS, of the Department of Geography of the University of Kansas, examined the deficiencies of contemporary map making. These deficiencies stem from several sources. Many cartographers often confuse the function of a statistical map with that of a statistical table. Secondly, many map makers do not adhere to the conventional symbology of thematic mapping -- the graphic language which has developed through centuries of cartographic experience. Thirdly, some statistical map makers do not sense the relationship between data processing and the fidelity with which their map portrays the information they wish to convey. And finally, too many map makers are either not trained in, or appreciative of, the subtleties of graphic communication; the subject matter should be presented with simple and clear graphic statements. Several examples were presented and contrasted; corrective procedures were suggested and some opportunities for improving statistical maps were proposed. Professor Jenks' paper, an abbreviated version of his presentation in Reston, also appears in The American Cartographer, volume 3, number 1, April 1976.

JAMES CORBETT, formerly with the Statistical Research Division of the Bureau of the Census, is responsible for the development of the theory underlying dual independent map encoding (DIME). In his paper "Topological Principles in Cartography" he set forth the mathematical foundation for modern automated cartography, based on relevant parts of topology and graph theory. The generality and future value of this theory were also discussed.

WALDO TOBLER has been with the Geography Department of the University of Michigan since 1961. His primary specialty is cartography and the development of computer methods, while his related interests are in the mathematical modeling of the geographical aspects of social processes. In his paper "Mathematical Map Models" he used examples to illustrate the mathematical model underlying only three classes of geographical map. The first model, a geometrical one, has a long history and is well known to cartographers. Some novel interpretations were demonstrated. The second model dealt with operations on a scalar function. Realizations of this model occur in the field of picture processing, and these can be applied to aerial photographs, to maps of topography, or to maps of population density. Illustrations were presented, using these topics, of the value of enhancement and degradation. A mathematical interpretation of these processes was given, and the roles of resolution and quantization were examined. The last example considered the case in which the cartographer is presented vector valued data, and a novel approach was again demonstrated.

ROBERTO BACHI was a professor of statistics in several Italian universities before organizing the Department of Statistics at the Hebrew University in Jerusalem, where he is currently professor of statistics and demography. He is the author of many books and papers on various topics of statistical methodology, general demography, social statistics, etc. He urged a reappraisal of the entire graphical field to insure that graphs and maps -- whose use is increasing due to growing demand and improved automatic production techniques -- meet proper scientific standards. The consequences of limitations of usual graphical methods should be evaluated and, as far as possible, eliminated or corrected. New methods should be developed to fill existing gaps. In his paper, "Graphical Methods for Presenting Statistical Data: Progress and Problems," he gave examples of proposals in this direction and discussed the possibilities of international cooperation in this area.

JOHN C. SHERMAN is a professor of geography at the University of Washington, Seattle. He has received various research grants and research contracts in the fields of cartography and geographic applications of remote sensing. His paper was entitled "Maps for the Visually Handicapped." There are two groups of persons for whom few maps are available. There are the partially-seeing and the legally or totally blind. He described the creation of two prototype maps and a new photo-mechanical system for creating

tactual maps which is applicable to almost any graphic device and which preserves the opportunity to fully utilize automated procedures in their creation. Particular attention was given to dual use maps for those with restricted or no sight, as well as for those with normal sight.

JOEL MORRISON is an associate professor of geography at the University of Wisconsin-Madison, and Director of the University of Wisconsin Cartographic Laboratory. His primary responsibility and research field is thematic cartography. Dr. Morrison discussed the theory of map generalization with particular reference to the processes of simplification and classification. He suggested that a nonrigorous definition of generalization is of little use for making a map with computer assistance. He offered a more rigorous definition for the purpose of classifying the processes involved in map generalization. He attempted to show how these processes have been and/or may be implemented in practice, and to provide some insight into the economics of generalization algorithms relative to the total map preparation costs.