Quantitative Studies of Urban Problems

AAAS Symposium • 27 December 1969 • Boston

There seems to be considerable agreement among social scientists and other students of public affairs that America's greatest domestic problem is its cities. Our foreign affairs can hardly be considered to be in a happy state—the Vietnam war, the balance of trade payments, and a potential confrontation with the Communists over the Middle East and the Mediterranean all seem insoluble problems. But the problems of the American city, many agree, are larger and more difficult to solve.

Major efforts of many kinds are being made to deal with the so-called "urban crisis." The President has created a cabinet position to concern itself with urban affairs. Various centers and institutes for research into urban problems have been established within universities and other private and public research organizations. A number of philanthropic foundations have turned their efforts and their resources to this area.

Many disciplines have volunteered their special tools and skills to this problem area. What we term the urban problem is actually a problem of many dimensions. The manifestations of this problem, as they are described in the public press, seem to include virtually every feature identifiable with urban life. Among others, there are problems of a social, psychological, physical, and economic nature in our cities demanding the attention of a wide spectrum of our social and our physical sciences. It seems clear that the urban problem does not fall wholly within the purview of any one professional specialty or even within any small group of these disciplines. It also seems clear that little progress has yet been made by any of these specialties on this problem or any part of it. The complexity of this problem, its size and importance, has made it difficult to produce early results.

The role of the physical and mathematical sciences in the study of these urban problems is becoming increasingly clear. In such emotionally charged and politically sensitive problem areas, it is frequently the case that progress is impeded by pointless bickering and argument. Controversy is created where none should exist; argument frequently arises out of misunderstanding. And worse action is taken on the basis of bad "facts," which may be nothing more than myths, facts established by tradition. Eventually, the failure to progress adds fuel to the fires that were to be extinguished.

Operations research is one of the discipliness contributing to a better understanding of the urban problem and to better hopes for its solution. It seeks to develop a quantitative approach—a scientific approach—to the *statement* of the urban problem, to the *identification* of possible remedies, and to the *selection* of feasible political and economic solutions. It accepts none of the myths; it asks for measurement and definitions. It starts with the component problems of the city: the problem of providing the material, cultural, social, and other requirements for the city which make our urban centers desirable habitations. When enough is understood of the component problems, perhaps then we can deal with the entire urban system.

Part I of this session presents recent treatments of two component problems and a comprehensive approach to the total system. Our first paper deals with the subject of urban dynamics and shows how a model of the city and its various activities can be simulated to reveal the consequence of policy choices. A second paper deals with the problem of supplying a vital resource, water. A third deals with the problem of supplying a vital service, criminal justice. Together, these present a sampling of the operations research–systems analysis approach to urban problems. Progress on this route has been slow, but there is every indication that such quantitative treatment of these problems offers one of our better hopes for resolving the difficulties that we confront in our cities.

DAVID BOODMAN
Arthur D. Little, Inc., 35 Acorn Park, Cambridge, Massachusetts 02140