

fort to understand and appreciate the problems of the other.

Model-building itself is not really new, even though the term is. Models of various types, mathematical and otherwise, have been used for centuries in science and in engineering. The whole purpose of mathematical physics, for example, is to represent the physical laws of nature in the form of mathematical relationships for purposes of analysis. What is fairly new is the greatly increased emphasis placed on the use of models in the area of management decision-making with respect to complex man-machine systems. To meet ever-increasing requirements for models in this area, various mathematical and logical techniques have been developed, which have some general application to many problems encountered in industrial and military operations. These techniques are continually being elaborated and new ones developed as new problems are encountered.

I'd like to use the remainder of this talk to describe briefly some of the more important types of mathematical techniques that have been developed in recent years for use in model construction. First, however, I'd like to mention, in the way of a historical footnote, that the Ancient Babylonians employed mathematics to solve management problems nearly four thousand years ago. In one instance they used arithmetical methods to devise an equitable food-rationing scheme during a period of famine. The records also show that these people made considerable progress in the development and application of elementary geometry and algebra.

It should be noted that one of the major shortcomings of mathematicians in those days was their inability to perform certain arithmetical operations using prime numbers like 7, 11 and 13. This was very embarrassing to them, because everyone from the King on down looked upon mathematicians as being infallible. To cover their ignorance they asserted with great authority that such numbers were endowed with evil magical properties and that any tampering with them would surely have