dire consequences. The wisdom and prestige of these learned men was so great that these numbers are still considered to be magical in some quarters, even today.

Although mathematicians are no longer considered to be infallible, they have developed their art for 4,000 years to a point where it is quite useful in many areas of activity. Problem-solving situations that can be treated by mathematical analysis are generally of two types; those whose cause and effect relationships involve a fair degree of certainty, and those in which there is some degree of uncertainty, and which require the use of probability theory and statistics. In addition, there are problem-solving situations that are so complex that mathematical analysis alone cannot be used. These are situations that require computer-simulation techniques.

I shall try to relate the examples that follow, to the categories I've just mentioned. An important problem area in which cause and effect relationships are assumed to be known with some certainty has to do with so-called allocation problems. Allocation problems arise in situations where a system has a number of activities to perform, but where there are restrictions either on the amount of resources, or the way they can be spent, which prevent us from performing each of the activities in the most effective way conceivable. In such situations we wish to allot available resources to the various activities in a way that will optimize the total effectiveness of the system.

An important class of allocation problems is the one in which the effectiveness of the system, and all restrictions, are expressed as linear functions of the allocation variables - and I'll explain what that means in a minute. The analysis of this class of problems is called "linear programming." And it's important, not only because many real situations can be studied this way, but because we have to know how to solve the problem.