tion of which, is pretty much beyond the capability of any other method.

Before I talk about some specific mathematical techniques I'd like to make several practical observations with regard to the use of system models. First, the usefulness of any model will be limited by the amount and quality of basic operational data available for input. The model designers should ordinarily be able to get most of these data from existing records and measurements of the system's past operation, and, by working closely with system management and operating personnel. However, if information about the value of a particular factor in the system is not available from these sources, a reasonable range of such values may be estimated and the model used to examine system operation for this range. If it is found by this means that the performance of the system is strongly effected by the value of the missing factor, then some experimentation with the system components may be required to attain this value.

Second, it should be emphasized that model analysis cannot be a complete substitute for full-scale trial of a system. Models can help to organize and analyze experience data for the purpose of drawing certain conclusions, but many intangible factors which a model can't take into account will often effect system operation significantly. Therefore, managers must know the limitations of the models they employ, and must use their experience and good judgment to interpret model results in the light of these intangible factors.

This brings up the problem of communication between the mathematical analyst and the manager. A system model may be so intricate in its technical detail that the executive cannot possibly verify the logic to the same extent that he might in a conventional management staff study. I mention the problem, but I know of no way to solve it, except perhaps through the development of mutual confidence over a period of time as each side - the manager and the analyst - makes a conscious ef-