a ship is searching a thousand square mile area for a submarine which, in turn, is studiously trying to avoid being found. Furthermore, suppose the search area is divided into two sub-areas, A-1 and A-2, having areas of 300 and 700 square miles, respectively. Finally, suppose that the search rate in A-1 is 10 square miles an hour, while the search rate in A-2 is 30 square miles per hour; and that both hunter and hider know this. A game matrix is set up, as shown on the slide, with detection probability per hour taken as the value of the game to the hunter. This was found by deciding the search rate per hour in a given sub-area, by its area. The problem is to determine what fractions of their time the hunter and hider should spend in each of the sub-areas in order to optimize their respective chances of succeeding.

As it turns out, each has spent 56% of his time in A-1, and 44% of his time in A-2. And the expected probability of detection per hour is about .02. It was interesting to note that if the hunter conducted his search uniformly over the whole thousand square mile area and the hider knew it, the expected detection probability per hour would drop to .01. On the other hand, if the hider moved uniformly over the whole area and the hunter knew it, the expected detection probability per hour would rise to .03.

Game theory is potentially valuable in both business and military situations. Its application in such situations depends largely on how accurately and exhaustively the choices of strategies and their consequences can be determined by the analyst.

Many systems existing today - particularly military systems - are so large and complicated that ordinary means of analyzing them are inadequate. Frequently we can construct mathematical models for portions of such a system, but a study of the system as a whole requires what I like to refer to as the last resort approach;