he plays and do this in some manner unknown to A. To hold his own, A must also change his strategy from play to play. In order to keep the strategies to be used for various plays a secret from one another, A and B will make their selections by some random means. Before doing so, however, each player must determine the relative frequency with which he should select the various strategies open to him, so as to secure for himself the greatest possible expected gain.

A player who changes his strategy from play to play, selecting each new one randomly, but according to prescribed relative frequencies, is said to employ a mixed strategy. His basic problem is to select the optimum mixed strategy. And this is the fundamental problem in game theory.

For those of you who are interested in how A calculates his best mixed strategy, consider the equation shown on the slide. Incidentally, that second equation should be a little A sub-I J, not a big A sub-I J. Let P sub-I be the probability that A will select strategy A sub-I for any given play. And let V by the expected value of the game to A if he uses the best mixed strategy. Then, if the linear equations that are shown on the slide are solved simultaneously for the three Ps - P-1, P-2 and P-3 - the values of these Ps will give the relative frequencies with which the various strategies must be selected, for A to have the optimum mixed strategy. The first equation simply shows that the sum of the probabilities must equal one. That is, A must play some strategy every time.

The second equation states that the expected value of the game to A must be the same no matter which strategy B employs. Player B will determine his best mixed strategy in a similar manner. It should be noted that the expected loss or gain to B must be the same as the expected gain or loss to A. That is, B must have the same value for both player A and B.

Let us look, now, at a particular example of a two-person game. Suppose that