

great deal if you lose (up to your total investment plus confusion and time); and, in view of the great uncertainties and typical drastic changes in specifications, have little chance of winning.

EXCESSIVE CENTRALIZATION OF DECISION-MAKING

There seems to be an inevitable tendency in bureaucracies for decisions to be made at higher and higher levels. The forces in this direction are simple and easy to understand, but so powerful that they are almost irresistible even when understood. There are some good reasons for making decisions at high levels. The high level official can take a broader, less parochial view; he perhaps has a better conception of over-all Service or national requirements; the fact that he is at a high level suggests that he may be an abler person. On the other hand, there are excellent reasons for making most decisions at lower levels. Officials on the spot have far better technical information; they can act more quickly; giving them authority will utilize and develop the reservoir of ingenuity and initiative in the whole organization. Moreover, if large numbers of detailed decisions are attempted at a high level, or if decisions first made at lower levels may readily be appealed to be remade, the higher levels will become swamped in detail, decisions will be delayed, the organization will become muscle-bound, and the higher levels will have neither time nor energy for their essential function of policy-making.

Nevertheless, the high level official is acutely conscious of his advantages in making any particular decision; and while the lower level official is at least equally conscious of his advantages, the higher level official is in a position of authority, and decides who is to make the decision—too frequently, of course, himself. The result is a constant tendency for the center of gravity of decision making to shift to higher echelons. New higher echelons, in fact, get invented from time to time to facilitate this movement.

The implications are serious for the kind of flexible research and development management that will capitalize on the ingenuity and initiative of science and industry. The problem is not confined to the military Services or to the government. Industry and universities have their bureaucracies too. One very perceptive administrator of industrial research, C. E. K. Mees, described the problem in industry as follows:

The best person to decide what research work shall be done is the man who is doing the research. The next best is the head of the department. After that you leave the field of best persons and meet increasingly worse groups. The first of these is the research director, who is probably wrong more than half the time. Then comes a committee, which is wrong most of the time. Finally, there is a committee of company vice-presidents which is wrong all the time.¹³

¹³ As quoted by John Jewkes, David Sawers, and Richard Stillerman, *The Sources of Invention*, Macmillan & Company, Ltd., London, 1958, p. 138.