

officials. Indeed, quite the contrary is true, and an appropriate delegation of responsibility—either to subordinate public officials or by contract to private persons or organizations—for the detailed administration of research and development work is essential to its efficient execution.

It is not always easy to draw the line distinguishing essential management and control responsibilities which should not be delegated to private contractors (or, indeed, to governmental research organizations such as laboratories) from those which can and should be so assigned. Recognizing this difficulty, it nevertheless seems to be the case that in recent years there have been instances—particularly in the Department of Defense—where we have come dangerously close to permitting contract employees to exercise functions which belong with top Government management officials. Insofar as this has been true, we believe it is being rectified. Government agencies are now keenly aware of this problem and have taken steps to retain functions essential to the performance of their responsibility under the law.

It is not enough, of course, to recognize that governmental managers must retain top management functions and not contract them out. In order to perform those functions effectively, they must be themselves competent to make the required management decisions and, in addition, have access to all necessary technical advice. Three conclusions follow:

First, where management decisions are based substantially on technical judgments, qualified executives, who can properly utilize the advice of technical consultants, from both inside and outside the Government, are needed to perform them. There must be sufficient technical competence within the Government so that outside technical advice does not become *de facto* technical decision-making. In many instances the executives making the decisions can and should have strong scientific backgrounds. In others, it is possible to have non-scientists so long as they are capable of understanding the technical issues involved and have otherwise appropriate administrative experience.

By and large, we believe it is necessary for the agencies concerned to give increased stress to the need to bring into governmental service as administrators men with scientific or engineering understanding, and during the development of Government career executives, to give many of them the opportunity, through appropriate training and experience, to strengthen their appreciation and understanding of scientific and technical matters. Correspondingly, scientists and engineers should be encouraged and guided to obtain, through appropriate training and experience, a broader understanding of management and public policy matters. The average governmental administrator in the years to come will be dealing with issues having larger and larger scientific and technical content, and his training and experience, both before he enters Government service and after he has joined, should reflect this fact.

At the present time, we are strongly persuaded that one of the most serious obstacles to acquiring and maintaining the managerial competence which the Government needs for its research and development programs is the discrepancy between governmental and private compensation for comparable work. This obstacle has been growing in-