

are prone to take particular pride in making contributions to the general body of knowledge in the natural sciences and to feel more identified with a career in a university setting, while mechanical engineers are much more interested in solving technical problems and look forward to a career in industry.⁹ Since these interests become deeply ingrained in the value systems and personality structure of scientists in contrast to engineers, and vice versa, it is well to distinguish between the problems attendant upon employing scientifically trained persons in development activities and those attendant upon employing engineers in research activities. Research differs from development not only in its objectives, but also in the kinds of professionals who are likely to be most amenable to these objectives. This is sometimes overlooked by those who talk about R. & D. without distinguishing between "R" in contrast to "D".

Much of the conflict between scientists and managers that has been described in the relevant literature arises from the fact that scientists today are being employed in industry and government in increasing numbers. In these contexts, they are subjected to the process of bureaucratization. In the process of bureaucratization, as it was originally described by the German social scientist, Max Weber, a formalization of the structure of administration takes place.¹⁰ This includes (1) a clearly defined hierarchy of authority which appears as a pyramid in an organization chart, (2) a high degree of specialization of function in various departments and down to the level of individual jobs within the organization, and (3) a proliferation of formal policies, written regulations, job descriptions, and other prescriptions. In this bureaucratic form of organization that is characteristic of government agencies and large industrial corporations, employees are hired to fill the pre-stated requirements of particular jobs; personnel are presumed to be interchangeable within job categories; and thus men are hired to meet the requirements of the job, rather than tailoring the job to correspond to unique individual capabilities. Furthermore, the normal pattern of career progression in bureaucracies is upward through the hierarchy into managerial roles within the particular organization. Finally, and perhaps most important for our considerations here, the bureaucratic form of organization ordinarily assumes that quality control over work will be exercised by higher level management officials within the organization, rather than in terms of internalized professional standards.

Thus we can see the contrasts between the conditions of work that scientists have learned to expect by virtue of their professionalized training and the conditions of work that they find in the
