

individual or agency. The significance of the research contract for the professional scientist is profound because it establishes a relationship that cuts across the normal lines of hierarchical authority in a bureaucratic type of organization. The scientist, as principal investigator, becomes responsible for the quality of his work and for meeting various research requirements to the project monitor, or official representative of the sponsoring group or agency, rather than to his immediate administrative supervisor in the employing organization. Under such conditions, the employer comes to provide service functions to the principal investigator, rather than exercising direct supervisory responsibilities over the research.

Our studies of research entrepreneurship have found that almost all scientists in large universities and in independent research organizations reportedly have opportunity to sell research ideas to various sponsors outside their immediate administrative hierarchies, while from 50 to 60 percent of those in several industrial and government laboratories studied also report the opportunity to be research entrepreneurs. We find that many scientists do not personally enjoy "having to sell" research ideas, but that those who do and who are therefore successful research entrepreneurs are more likely to be more highly qualified scientists in terms of their education and experience, are more likely to be more professionalized in their interests and activities, are more likely to be able to freely select the research projects they work on, and are also more likely to produce more research publications in professional media. In other words, those whom we have identified as research entrepreneurs are more likely to obtain the kinds of opportunities that they desire in government, industry, and other organizations. At the same time, they are also more likely to be productive in a professional-scientific sense.

Not all research scientists are successful at selling their own research ideas, however, and fewer still are successful entrepreneurs all the time. Another mechanism is available to these people to obtain means for professional self-expression in more bureaucratized employment contexts. I refer here to what researchers commonly call "bootlegging." By this I mean engaging in non-formally-specified research activities within the context of larger formally-structured research projects. Bootlegging is sometimes done with some sense of guilt among research scientists, but ordinarily it does not represent any direct contradiction of requirements set forth in work statements for research projects. Usually the work statements for research projects are general enough to allow considerable flexibility in the way that scientists can handle the details of a project. Where they have this flexibility, scientists are

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