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## Research Is Research Is Research

Federal research funding policy, particularly in the mission-oriented agencies, has been a matter of persistent concern to the scientific community for the past several years. Support for a number of significant areas of investigation has been effectively cut, and—perhaps more serious—large numbers of areas have been dichotomized, with ever-increasing rigidity, into basic or applied, with the basic being given a lowered priority as not immediately relevant and therefore unimportant.

But those who set funding policy must learn, as the scientific community is learning, that to dichotomize scientific research into pure and applied is to reify a specious distinction, for science is, in its most fundamental sense, an approach to solving problems. Its goals may be both specific and general, concrete and abstract, practical and theoretical, and immediate and long-range, and several centuries of experience have demonstrated a significant reciprocity between conceptual and practical advance.

An instructive example is found in recent work of the U.S. Department of Agriculture (USDA). Marek's disease is a highly contagious disease affecting the peripheral nerves and the visceral organs of domestic chickens. It results in a loss to the poultry industry of more than \$200 million annually in the United States alone. Scientists at USDA, principally at East Lansing, Michigan, studied this disease for more than 30 years before showing, in basic studies, that it is caused by a herpes virus. In the same year, a similar virus was isolated in turkeys, and within 2½ years a vaccine had been developed that reduced the incidence of Marek's disease in vaccinated chickens by 90 percent, reduced condemnations in broilers by a similar amount, and increased egg production in layers by 4 percent. Efforts are now under way to reduce problems of cost, storage, transportation, and use, in order to maximize the benefits of the vaccine.

But the story does not stop here. Marek's disease is a neoplastic disease, and finding a successful treatment for it may entail a significant breakthrough in the control of at least certain kinds of human cancer. Viruses have been identified with cancer in laboratory animals since the turn of the century. But through the middle 1960's, those so identified were virtually all of the RNA type and were transmitted vertically—that is, passed from diseased egg cell to the cells of the offspring. The work on Marek's disease, in contrast, is not only the first clear demonstration that a herpes virus produces lymphoma, but, more importantly, that the infection is horizontally transmitted (that is, spreads directly among organisms through contact or proximity) and can be successfully controlled by vaccine. While the mechanism of protection is not yet understood, a whole new way of looking at cancer is now possible.

The President, in his 16 March message to Congress,\* disavowed the policy of dichotomization in research funding when he reported that all agencies and departments would support basic research. He spoke of "the importance of maintaining that spirit of curiosity and adventure which has always driven us to explore the unknown" and asserted the need to "continue to give an important place to basic research and to exploratory experiments which provide the new ideas on which our edifice of technological accomplishment rests." The scientific community now eagerly looks forward to information on how these agencies and departments intend to translate the President's statement of principle into administrative practice.—WILLIAM BEVAN

\* Weekly Compilation of Presidential Documents, Monday, March 20, 1972 (Government Printing Office, Washington, D.C., 1972), pp. 581-590.