THE FEDERAL GOVERNMENT AS A PARTNER

Orville G. Bentley

As a nation, we are philosophically and pragmatically committed to the proposition that economic and social progress will be sought through the development of scientific knowledge which in turn provides the lifeblood for new and more sophisticated technological progress. This commitment touches every facet of our life, from leisure time through the working day, with obvious implications interwoven through business, commerce, government, national defense, and the nation's international posture. The ramifications of this national moire are many in terms of physical comfort to people, changes in living standards, the use and development of resources, and in the value judgments held by people for a philosophy of progress through scientific change, vis-a-vis a society where maintaining the cultural and social status quo is a highly valued objective.

The spin-off from the national scientific establishment began to gain momentum during and immediately following World War II. In World War I Germany had shown the world that science was a defense asset. I need only cite their near monopoly on the dye industry won through German scientific prowess in the field of organic chemistry. A new science of biochemistry and its application in fermentation processes had given Germany a new source of precursors in the production of explosives. By World War II the armaments of the leading powers had incorporated new sensing devices and new and more powerful weapons, and had begun to utilize computerized systems to replace manpower in conducting warfare.

Such dramatic breakthroughs as the atomic bomb, guided missiles, and the application of electronic know-how in communication systems dramatically heralded a post-World War II scientific and technical age. Besides its obvious impact on industry and the consuming public, these developments brought revolutionary changes in our national attitude toward science and the scientist. As one would expect, many of World War II developments fed on basic science discoveries accumulated in the world's literature from previous decades —for example, the release of energy from the atom studied by the world renowned Italian scientist, Fermi, in the '20's and '30's. It became apparent that, as the storehouse of science was used up in the

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crash programs of World War II, there was a need for a speed-up in research on every front in the United States.

The federal government's initial approach to this broader support of science was primarily directed toward the achievement of specific missions, with only a limited consideration of the need for pure science and the broad educational base that would nourish the total establishment. Soon the shallowness of the short-range approach was widely recognized and Congress, state governments, and private industry began to think more in terms of the scientific foundation for such mission-oriented programs as the peaceful use of atomic energy, the support base for the massive space program dramatized by such objectives as placing a man on the moon by 1970, and sustaining our highly efficient agriculture.

Even the skeptics had come to realize that it was a sound investment of public funds to support science and technology as a part of the educational effort of the United States. As our science program became of age the federal government provided increasing support for science on a broad basis, on the assumption that the pay-off will benefit every segment of our society and provide a basis for continued economic growth. Perhaps it should be emphasized that there is still a strong motivating factor from the defense requirements in the continuing armament race that has plagued our world for centuries.

Annually the National Science Foundation compiles a tabulation of federal appropriations for research and development, which is now commonly referred to in the alphabetical potpourri as "R and D" expenditures. A review of these figures is revealing indeed.

In 1940 these appropriations amounted to a total of $74 million (about 40 percent went for agricultural research). By 1966 the expenditures for "R and D" will be in the magnitude of $15.4 billion. Incidentally, now less than 2 percent going for the federal support for research is spent on the agricultural sciences. Another striking aspect of these statistics is that about one-half of the total expenditures of federal "R and D" money—$125 billion—has been spent in the past five years, which suggests that we have now geared up a substantial research apparatus that will, if it is to stay intact, demand continuingly larger slices of the federal resources.

How the federal "R and D" money is being spent is of considerable interest. According to the National Science Foundation, 32 percent of the federal expenditure is made by profit organizations and 68 percent by educational institutions, government, and non-profit and other domestic and foreign organizations. It is equally interesting to take a look at the fields of science in which the expenditures were made. Twenty-four percent of the money was spent in life sciences and 67 percent in engineering and the physical sciences proper, leaving only 2 percent of the expenditures being made in psychological sciences, 3 percent in social sciences, and 2 percent in other sciences.

These huge expenditures are generating new scientific information at a prodigious rate. An ancillary effect has been the increased demand for new concepts to facilitate the recording, storing, and retrieval of information. Operationally, research and development organizations, both public and private, require systems designed to provide scientific and technical information pertinent to their mission or scientific endeavor. The federal government itself had obligations for scientific and technical information of an estimated $259 million in 1966. In addition, the various agencies of the federal government are planning to spend $354 million for general purpose scientific information on various natural and social phenomena so as to service the variety of users including the public agency, general public, and research investigators.

The purpose for citing these figures is to illustrate the magnitude of the federal research program currently underway in the United States and to describe in terms of dollars just one aspect of the scientific and technical information service created in the past few years by the huge increase in federal support for "R and D."

Private investment in research likewise increased substantially, nurtured by rising demands for consumer products combined with a demand created in part by the annual federal expenditure for the hardware and systems approach used in probing space by NASA and the defense establishment. New ideas and products breed new demands too. For example, agricultural chemicals is a multi-billion dollar business which was spawned by basic research in chemistry, biology, and agriculture.

The rapid expansion of enrollments in educational institutions, together with the scientific expansion, has made it obvious that libraries must grow in size and sophistication. It is equally obvious that a massive infusion of support is needed if the American library is to accumulate, store, and provide a data retrieval system commensurate with the growth in the knowledge-producing capability of the new national research establishment. Such help has been forthcoming through several congressional acts with which you are familiar.

The first step has been made—public recognition of the real need of the libraries for staff, facilities, and research on the effectiveness of the system. The next step is to learn how to live with these new concepts of service and to provide the benefactor with the resources needed to create and sustain these services. I am not a librarian or a specialist in procedures for acquiring funds under any of the federal programs open to libraries; but I can tell you about a hundred years of federal partnership in a concept for support of education in the land-grant philosophy and seventy-five years of joint program-planning and support in agricultural research, plus over fifty years of a cooperative effort in a nation-wide extension or continuing education program.

One of the unique characteristics of agricultural research and education is the cooperative role of the federal government in the support and planning of research and extension education programs in agriculture and home economics. What is the federal role in these activities?

First, federal legislation gave birth to the idea. The Hatch Act of 1887 authorized the payment to states on a matching basis for the purpose of assisting them to establish a research program for agriculture at the land-grant college, then frequently called the agricultural college or the college of agriculture and mechanic arts. About thirty years later the Smith-Lever Act of 1914 extended the principle of joint funding, only now there was a tripartite composed of the federal government, the state, and the local government. Usually a county was involved. The Smith-Hughes vocational education legislation was aimed at joint support for vocational education in the secondary schools. Philosophically, all of these activities had these common characteristics:

(a) Joint funding of the states and the federal government.

(b) A substantial program thrust directed toward a segment of the population that felt itself somewhat educationally and economically deprived. Rural America was characterized by a large number of small entrepreneurs isolated by limitations in communications, travel and contact with social and cultural advantages generally more abundant in urban centers than in areas of dispersed population.

(c) Mutual recognition that local leadership was responsible for program development and direction.

This joint effort has been immensely successful. Why? It is hard to point out a single reason for the success of these programs, but it seems to me that one of the fundamental reasons is that there was and is a recognized need, both nationally and at local levels, for a program of research that would deal with agriculture, agri-business, and the people involved. It is not necessary to recount for you the events leading up to the passage of the Land-Grant Act of 1862. Here a minimal amount of federal support encouraged the establishment of a system of colleges whose educational philosophy was to teach, in addition to the sciences and humanities, "agriculture and the mechanic arts and military sciences." The success of these institutions is a legend and one of the truly American innovations in education. The soundness of the decisions to create institutions that would be supported from state and federal funds is indicated by the fact that these embryonic colleges of the 1860's developed into some of the largest comprehensive universities of the world.

During the past seventy-five years a number of procedural devices have evolved to facilitate cooperative planning in the communication of ideas and work plans among agricultural research workers

and administrators. All these procedural plans have emphasized cooperation among local, state, and federal agencies, with lines of communication and autonomy clearly drawn.

Need is a key factor in generating support and program continuity. The libraries have a need to extend knowledge to the disadvantaged in both rural and urban America; there is a need to build for intellectual excellence, so eloquently articulated by the Secretary of Health, Education, and Welfare, John Gardner. There is a need to do research on the new systems of knowledge distribution and on an evaluation of these programs. Are libraries making a meaningful impact on the disadvantaged? Can we be more effective with the intellectually average student and can we challenge that top 2 percent of the intellectual giants of our country to help shape them into the geniuses we need to keep our increasing computerized and programmed society moving?

Need alone will not bring support automatically. We have found that as a partner with the federal government, the Congress wants to be informed about programs, how appropriated money is being used, the progress or output function, and plans for next year. Through communication and presenting such views, conceptualizing needs, with evidence of program leadership, need can be articulated. Money will not be allocated in a vacuum. The agricultural experiment stations and the state cooperative extension services of the land-grant universities have a strong and respected voice won by action and participation in policy making and planning. We have a partner in the federal establishment in the form of the USDA, but our voices are heard directly in the Congress, too, as we seek to represent the needs of the people we serve.

The parallelism between federal support programs for agricultural research and extension education suggests that the libraries might find it to their advantage to familiarize themselves with the various planning and philosophic approaches used by the colleges and the U. S. Department of Agriculture. Though programs differ markedly, there is a common thread of purpose and goals: education, people, and service.

As you will recall, throughout the first half of the twentieth century, the trend in population movement was from the farm to the urban areas. Many leaders envisioned this trend as one that would deplete rural America of its leadership, leaving a residue of people who would be subject to some of the educational disadvantages that were inherent in some of the more sparsely populated areas. It is a tribute to our Congress, and to our society in general, that they recognized the merits of an informal educational system that would have as its philosophical base the "grass-roots professor" who would provide educational leadership at the local level.

As the American library system begins to gear itself for expanded educational programs, the spirit and some of the educational concepts found to serve a useful function in the educational efforts utilized by the Cooperative Extension Service might well be considered. Our experience has shown that the federal government is a valued partner not only because of its financial benevolence, but programmatically as well.

In summary, I suggest some guidelines which you might find useful in developing a more meaningful relationship in your partnership with the federal government in a program of mutual endeavor —namely, the extension, development and enrichment of the American libraries as institutions and in the quality and scope of the services they can provide.

A. The program must be articulated in such a way as to have meaning and understanding at both the national and local levels.

B. Devices for communicating joint planning efforts must reflect the views and recommendations as seen at the grass-roots level and must preserve local autonomy in program building, personnel selection, and budgetary decisions.

C. Federal support will bring constraints and program guidelines, but help build them to suit your program objectives. To accomplish this objective, you will need to spend time and effort on planning and coordination required to assure communication, program review, and planning by libraries at the local level. Libraries must take it upon themselves to give imagination to programs and such devices that will help build cohesive units at the county, multi-county, and regional levels within the state and on an interstate basis. They can likewise show their capability to develop mutually acceptable multi-state regional projects.

The federal government and its multitude of agencies ultimately reflect the thinking of individuals. Ideas, concepts, and imagination are the motivational factors of people in the federal agencies and for state and local programs alike.