

THREE YEARS AFTER THE HAUSER COMMITTEE REPORT ON SCIENTIFIC AND TECHNICAL PERSONNEL DATA

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Introduction

Before launching into this topic, I would like to make clear that I have no intention of presenting a carefully balanced objective presentation of this subject. The topic of scientific and technical personnel is such a broad one, and involves so many different programs and approaches that only with the greatest difficulty can one individual become thoroughly conversant with all aspects of it. Such observations as are contained in this paper are prepared from the vantage point of one who has been intimately concerned in Government with collection and analysis programs in this area for several years. Necessarily many important non-Government programs will not be discussed, and time limitations will not permit a full treatment of even all those within Government. However, I do not want to let the opportunity pass without saluting the fellow-laborers in this vineyard; particularly some of those in universities, in the professional societies and in research organizations who are taking an increasing interest in studies of scientific manpower. We are delighted to share the work with them, and very much welcome the contributions they are making.

The "Hauser Committee" Report of 1958

The so-called Hauser Committee Report was the product of a special Advisory Panel appointed jointly in 1957 by the National Science Foundation and the then existing President's Committee on Scientists and Engineers. Both the Foundation and the President's Committee had found their programs handicapped by the lack of authoritative information on the supply and requirements for scientific manpower. The Bureau of the Budget, properly concerned with increasing Government survey activities in this field, had also requested the Foundation to "develop a program for collection of needed supply, demand, employment, and compensation data with respect to scientists and engineers and for such other professional groups as it considers appropriate" at about this same time.

These developments led to the appointment of the Advisory Panel in June 1957. The Panel was requested to review and evaluate available information, and to recommend such inquiries or other measures as it believed would provide additional information needed for policy formulation in the field of scientific and technical personnel.

The membership of the Advisory Panel reads like a "Who's Who" of those concerned with this topic. Membership was purposely selected to be broadly representative of non-Government organizations in order to secure as favorable a reception of its findings by non-Government groups as possible. Members were Philip M. Hauser, University of Chicago and our respected chairman for this session; Philip H. Coombs, then of the Ford Foundation and now Assistant Secretary of State

for Educational and Cultural Affairs; Henry David of the National Manpower Council and now President of the New School for Social Research; Colman R. Griffith of the American Council on Education and now at the University of Illinois; M. H. Trytten of the National Research Council; Ralph J. Watkins of Brookings; and Dael Wolfe of the American Association for the Advancement of Science. Secretariat services were provided by Surveys and Research Corporation, and five Government agencies, including the National Science Foundation, the President's Committee, and the Departments of Labor, Commerce, and Health, Education, and Welfare, supplied consultant services.

The Committee completed its deliberations and reported to its sponsoring agencies in the Spring of 1958. Based on this report, the Foundation released its recommendations as "A Program for National Information on Scientific and Technical Personnel" which has come to be known as the "Hauser Committee Report."

The Report reviewed briefly the growing needs for data on scientific manpower, evaluated the existing sources and types of data, and recommended a program of additional research and surveys covering about 15 topics. A "most urgent" priority rating was assigned to three projects in the categories of definition and classification of scientific personnel and jobs, periodic establishment surveys of the resources of scientific and technical personnel, and periodic studies of demand. Other recommendations in the Report ranged from sample population surveys to research on community attitudes toward scientific personnel. Some of its recommendations were broad in scope; others dealt with rather narrow specialized surveys.

It is not our purpose at this session to catalog in detail the many ways in which these recommendations have been implemented over the past three years. Detailed treatment is being given to the selected topics of periodic establishment reports, studies of demand, and the extremely interesting topic of Census-related studies by the other participants. This paper will touch on some of the ways in which the programs have been financed and coordinated. Some attention will also be given to an overall appraisal of progress and the importance of the Hauser Committee Report as a landmark in the identification of data needs for Government decision making.

Program Development

Soon after the release of the Report, the National Science Foundation was designated by the Bureau of the Budget to act as the "focal agency" for developing the recommended program. After the Federal Government English is unwrapped from this expression, we can interpret it as meaning to act in a leadership role with the Government

agencies in planning, determining priorities, and publication of data in this field. This designation has simplified the task of developing a coherent program embracing many topics and involving the programs of a great many other agencies, Government and non-Government.

It is well known that the Government's statistics program operates on a decentralized basis involving many different agencies in its collection aspects. Data relating to scientific and technical manpower are no exception to this rule. For example, the U. S. Office of Education is the agency generally collecting statistics on education, the Department of Labor usually collects data on employment, and the Bureau of the Census is most frequently concerned with surveys of population. The usual pattern is that the responsible individual agency seeks appropriations from Congress for that part of the program for which it considers itself responsible. The advantage of this method of financing is the close association between responsibility for performance and accountability for funds. The disadvantages include the possibility that specialized needs may be lost sight of or subordinated in larger general programs and a lack of flexibility in finding financing for new programs on short notice.

The National Science Foundation has been able to utilize the resources available to it for manpower data and studies in ways which strengthen the existing institutional arrangements. For the most part its resources are used to support, through transfer of funds, the logical extension of other agencies' programs into the desired fields. Such support for continuing series will normally be provided for an initial period of perhaps two or three years. Upon completion of this period, support will usually be withdrawn with the understanding that the program-extension has become of sufficient importance to the other performing agency as to warrant direct appropriation for the purpose. Support is likewise frequently provided for single-time studies. Under such arrangements, the performing agency benefits through the additional resources provided to it as contrasted with the alternative prospect of finding a competitor in its field. The general program benefits through the ability to move resources into priority areas as they develop on relatively short notice in contrast with the ponderous machinery required by regular budgetary cycling. This principle is working well with respect to several surveys and studies being performed in the Bureau of Labor Statistics and Office of Education.

Transfer of funds appropriated to the Foundation has also been instrumental in utilizing the resources of some non-Government, especially non-profit, agencies to perform some of the research and studies recommended by the Hauser Committee Report. Such agencies, particularly the professional societies, universities, and research organizations, frequently have highly competent research staff who can be interested in a wider program when a relationship can be

found to their own specialized preoccupations. In this way, advantage can be taken of the services of well-qualified staff, many of whom would not be available to Government on a more conventional basis. The Foundation has been able to support studies on science teacher qualifications and teaching loads at the American Association for the Advancement of Science and on traits and characteristics associated with successful careers in science at Columbia and Harvard Universities to cite a few examples. Currently, an experimental program at the American Institute of Physics is being supported to determine the practicability of developing in a professional society setting a research and information center dealing with manpower problems in specific disciplines.

Let it be clearly recognized that any Government program of studies and research can only be successful if the Congress--especially the Appropriations Committees--is willing to authorize the necessary appropriations to make it so. The programs of the Foundation--as well as those of other Government agencies--in this area have been singularly fortunate over the past few years in this regard. Growing interest in the Congress in the twin topics of science and scientific manpower has been generally effective in producing relatively sympathetic appropriation actions. There is no question but that this willingness to provide the additional funds necessary is primarily responsible for the very considerable progress which has been made.

Program coordination has been directed toward attaining a maximum Government return from each new study, and at the same time imposing as minimal a burden as possible on respondents. For example, the establishment surveys of scientific personnel (recommended by the Hauser Committee) have been designed to meet the specific data needs of not only the Foundation, but of the Atomic Energy Commission and the National Institutes of Health as well. Special tabulations of the National Register of Scientific and Technical Personnel are prepared to meet the needs of other agencies, including the Civil Service Commission, the Public Health Service, and the Department of Labor. A genuine effort to lighten the reporting burden on respondents includes adoption of standard definitions, uniform reporting dates, and generous use of advisory groups.

The Present Status of Hauser Committee Recommendations

Progress in carrying out the recommendations of the Hauser Committee Report has been extensive. Without being exhaustive in this brief review or encroaching on the papers of my colleagues on this program, it can be said that some actions have developed with respect to each recommendation. Many agencies and programs have had a part in this effort, some of which has perhaps been performed without any particular reference to the Report or, in some cases, possibly without knowledge of it. However, most of the recent developments can be attributed to the general

acceptance of the recommendations of the Report as constituting the elements of a desirable program. Particularly noteworthy in this respect are some of the studies of the Office of Education in the areas of enrollments in science and technical training at all levels of the formal educational system; sources and extent of support for graduate training in the sciences; and a new study of science offerings in the non-public secondary schools. Establishment reports of the Bureau of Labor Statistics, the Office of Education, and the Civil Service Commission now provide an annual series on employment of scientists and engineers. The 1960 Census related study being developed with the Bureau of the Census and the National Opinion Research Center holds great promise of providing benchmark data on the pool of science manpower. Better information on the transition between the baccalaureate and enrollment in graduate study or entry into the labor force is available from recent studies by the Bureau of Social Science Research and the Women's Bureau. Staff studies by the Foundation have investigated such topics as the extent of retention in our educational system of our most able students; the contribution of immigration to the American science manpower pool; and the estimated demands for scientific personnel implicit in some of the rapidly expanding Government supported programs.

Lest our picture of progress appear too complacent, I would like next to touch upon some areas urgently requiring more attention. These include both the topics for which data are needed and the additional occupational groups which would be included.

Among the priority subject matter topics for which research is desired is the development of measures which will permit assessment of quality. For example, our science manpower resources are frequently classified into groups by educational attainment; i.e., doctorate, baccalaureate, or no degree. Under this system any possessor of a bachelor's degree is considered equivalent to any other as are the doctorate holders. Yet it is well known that ability-wise, the lowest graduate of some of our colleges will be better trained on any reasonable comparative basis than the highest in some other colleges. Scientific advances are usually attributed to a mere handful of individuals. In assessing manpower resources in a given field, how does one measure this qualitative factor? Similarly, how might one assess the quality of science instruction being offered at our institutions of higher education?

Another topic for exploratory research involves the utilization of scientific and technical personnel. Frequently, apparent shortage situations are assessed as "poor utilization." What kind of measures might be proposed as providing indexes of utilization practice? Such measures would be particularly useful in any assessment of feasibility of scientific programs from the standpoint of manpower resources.

The decisions now being made on almost a daily basis by the science program managers in

The mobility of scientific and technical personnel is a suggested third topic which requires study. The speed with which technological advance is pervading the economy means that university training is not able to anticipate or even keep pace with specialized manpower requirements. Yet manpower requirements are met, if slowly in some cases, through occupational mobility supplemented by short-term training as witnessed by the way manpower requirements were met in nuclear reactor engineering in an earlier period and in oceanography at present. What is the extent of such mobility, and between what areas of science can it be anticipated are the kinds of questions for which answers are sought by the analyst evaluating a proposed program calling for substantial demands upon our science manpower resources.

Our knowledge of manpower resources in the social science and technician occupations is another area of relative weakness. We now have relatively little information on the numbers and characteristics of the work force in the social sciences, an area which promises to require rather large numbers, and which will be in sharp competition with the other professions for well qualified and trained youth. Technicians are one of our fastest growing occupations, and yet, we know little on how many we have or how many are being trained. In both these cases, work has been handicapped by a lack of agreement of what should be included in such occupations.

Conclusion

In conclusion, it may be fairly said that the Hauser Committee Report constitutes an important landmark in the development of information on the Nation's scientific and technical personnel resources. Remarkable progress in developing the recommended programs has been achieved in the past three years. While much, of course, remains to be done before the comprehensive program recommended by the Report is fully implemented, it is now possible to estimate the general dimensions of many of the troublesome problems previously little known. It is particularly fortunate that this ability does now exist and the Report, coming when it did, provided a certain amount of lead time in developing data which make it possible. The aggregate affect significantly the economic and social fabric of the Nation. An annual research and development expenditure of \$14 billions now represents a little less than 3 percent of GNP. Scientists and engineers now constitute about 2 percent of the civilian labor force. Implementation of the Hauser Committee Report recommendations are now making possible a more rational basis for decision making in this area.

Finally, the future should hold a mechanism for comprehensive review and evaluation of our situation in this area before very long if we are to avoid "hardening of the arteries", which is likely to affect program no less than people. It is suggested that such review ought to take place within the next two years, but in any event not later than 1965.