

Science Policy in the Early New Deal, and Its Impacts in the 1940s

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The first volume of *Research: a National Resource*, entitled *Relation of the Federal Government to Research*, was transmitted to President Franklin D. Roosevelt by the National Resources Committee in November 1938 and was, arguably, one of the first significant attempts to articulate a national science policy for the United States. It was the first such report to consider links between the scientific bureaus of the federal government and the nation's non-government scientific resources and personnel. The Science Committee of the National Resources Committee was dominated by non-government social scientists. Its report urged more effective use of science as a tool for governance, as opposed to debates of the late 1940s on how to devise a national science policy to use science for the public good. Largely because subsequent volumes of *Research: a National Resource* were transmitted to President Roosevelt as he was becoming increasingly absorbed with the widening war in Europe, none of its recommendations were implemented, at least not immediately. However, the agenda of the Science Committee was resurrected by President Harry Truman in 1946 with his appointment of the President's Scientific Research Board, the first volume of whose report, entitled *Science and Public Policy*, was transmitted to the president in August 1947. Additionally, by the end of World War II, several protégés of the academic social scientists who dominated the Science Committee had been recruited to the Bureau of the Budget and were instrumental in formulating the de-facto national science policy that emerged in the latter half of the 1940s. Their contributions to the post-World War II flowering of science in the United States deserve recognition.



President Franklin D. Roosevelt early in his first term. FDR recognized the benefits of social planning in public administration.

Thus, the early New Deal attempts to establish and promote an active government science policy were of critical importance in the evolving institutional acceptance of these views and policies in the postwar years.

Post-World War II Science Policy Debates

The organization of U.S. scientific resources during World War II resulted in new or improved military innovations such as radar, the proximity fuse, the Norden bombsight, and, of course, the atomic bomb, which contributed significantly to Allied victory over the Axis powers. On November 17, 1944, President Franklin D. Roosevelt addressed a letter to Vannevar Bush, his science adviser, stating that “there is no reason why the lessons to be found in this experiment [mobilization of science for war] cannot be profitably employed in times of peace.”¹ Roosevelt then

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¹ Vannevar Bush, *Science—the Endless Frontier* (Washington, DC: Government Printing Office, 1945), 3.

requested a report from Bush recommending how, in effect, those lessons might be applied in peacetime. The resulting report, entitled *Science—the Endless Frontier* and submitted to President Harry S. Truman on July 5, 1945, is justifiably regarded as the cornerstone of post–World War II U.S. science policy, even though it made no claim to being a complete blueprint for such a policy.² One of its impacts was a series of congressional and public debates in the late 1940s on the dimensions of a national science policy.³

The post–World War II science policy debates, however, were by no means the first attempt to formulate a national science policy. No doubt that distinction belongs to Benjamin Franklin, James Madison, Charles Pickney, and a few compatriots, who tried, and failed, to convince fellow delegates to the Constitutional Convention in 1787 to endow the federal government with broad, specific powers to conduct and support scientific activities.⁴

Status of the U.S. Research System in the 1930s⁵

By the end of World War I, the U.S. research system comprised three distinct sectors—then, as now, the government, academic, and industrial sectors. Each had been established and developed during different periods, reflecting the changing character of the United States. From the Washington presidency (1789–97) until the Civil War (1861–65), government bureaus, including its military departments, were the principal, indeed virtually the sole institutions that conducted professional scientific work. During the post–Civil War period, several old-line colleges, starting with those on the Eastern seaboard, transformed themselves into research universities based on a model that had emerged in Germany around 1820, and a number of new institutions, starting in 1878 with Johns Hopkins, were established as research universities from the outset.⁶ Early in the 20th century, the first industrial research laboratories were created. Their number and significance increased significantly as a result of World War I, so that by 1930, industry was the principal investor in, and contributor to, scientific research. Prior to World War II, the three sectors of the U.S. research system operated largely as independent sets of organizations. Federal bureaus would frequently contract with industrial laboratories for specific purposes, and industry provided some funding for university research. However, the federal government provided no financial support for research in universities—or, for that matter, for instruction. Thus, as noted below, a recommendation of *Relation of the Federal Government to Research* that the federal government might provide limited funds for university research through a contract mechanism would have been considered radical prior to 1945.

All three sectors suffered considerable setbacks as a result of the Great Depression. But by the late 1930s, they were all well on their way towards attaining the financial status they had enjoyed prior to 1929.

² Ibid.

³ See, e.g., Merton J. England, *A Patron for Pure Science* (Washington, DC: National Science Foundation, 1982), 9–106.

⁴ A. Hunter Dupree, *Science in the Federal Government: A History of Policies and Activities to 1940* (Cambridge, Mass.: The Belknap Press of Harvard University, 1957), 3–6.

⁵ The discussion in this section is drawn primarily from Dupree, *op. cit.*

⁶ Richard C. Atkinson and William A. Blanpied, “Research Universities: Core of the US Science and Technology System,” *Technology in Society* 30 (2008): 30–43.

Social Science and Government

Although the social sciences were relative newcomers both as scientific disciplines and as members of and/or advisors to the federal government, their methodologies and insights had already made considerable inroads by 1937. *Relation of the Federal Government to Research* pointed to several earlier commissions created by Congress that had made effective use of the social sciences. These included the Industrial Commission (June 1898), the Immigration Commission (February 1907), the National Monetary Commission (May 1908), the Industrial Relations Commission (August 1912), and the Joint Commission on Agricultural Inquiry (June 1921).

Had *Relation of the Federal Government to Research* not been overly concerned with political sensibilities, it might also have noted that the Roosevelt administration's immediate predecessor had also recognized the desirability of using the social sciences as aids to governance. The two-volume *Report of the President's Research Committee on Social Trends*, published during the waning months of the Hoover administration, compiled and analyzed indicators on a wide variety of societal matters that had been affected by World War I and the Great Depression.⁷ Charles E. Merriam, vice-chairman of the committee, had been instrumental in convincing Hoover to appoint it in the first place and to have it organized through his Social Science Research Council.

While President Hoover (1929–33) was interested in planning as a means for creating programs that might moderate the severe economic effects of the Great Depression largely by catalyzing private-sector efforts, his successor saw it as a guide for government action. Very early in the New Deal, Merriam came to Washington in an advisory capacity in which he enjoyed a broader scope for his interest and experience with planning. He was probably the most prominent American social scientist to serve the Roosevelt administration while not actually accepting a position in it, although he finally did do so at the end of the 1930s.

Charles E. Merriam

Barry D. Karl, Merriam's biographer, has characterized him as

an academic entrepreneur whose extraordinary sensitivities to the ideas of his times were combined with a willingness to govern the resources available for the development of those ideas to produce a phenomenon rare even in its day: a genuine school of thought.⁸

Merriam's principal methodological innovation as the first member (in 1903) of the University of Chicago's political science department and within a few years a full professor and chair of that department was to give political science a less theoretical and more empirical grounding. In

⁷ Barry D. Karl, *Charles E. Merriam and the Study of Politics* (Chicago: University of Chicago Press, 1974), 196–98.

⁸ *Ibid.*, viii.

particular, he made use of Chicago itself as a laboratory for field research, following the example set earlier by academic sociologists. His *Non-Voting: Causes and Methods of Control*, co-authored with his colleague H. F. Gosnell and published in 1924, marked “the public debut of what came to be known as the Chicago School.” This study, “utilizing a research staff of undergraduate as well as graduate students, studied the Chicago mayoralty campaign of 1923.” It was “the first major study in political science to use both random sampling and the statistics of attributes.”⁹

Non-Voting and its underlying methodology drew largely favorable reaction from academic social scientists. Additionally, Chicago business and political leaders were impressed with the potential of such studies to serve as tools for urban planning. Merriam and his colleagues saw no conflict of interest in the simultaneous pursuit of academic studies in the social sciences and involvement with business and government. Indeed, they welcomed it. The primarily European founders of the social sciences regarded their disciplines as a basis for social engineering that would result in rational policy developments to improve social and economic conditions. Following the lead of their European mentors, social scientists of the pre-WWII era regarded their disciplines as a means for social and political change. Merriam himself became actively engaged in Chicago politics. He was elected as an alderman, and in 1911 even waged an unsuccessful campaign for mayor.



Charles E. Merriam, a political scientist at the University of Chicago, brought his expertise in urban planning to the new National Planning Board in July 1933.

As a means for creating a national academic social science community, in 1923 Merriam took the lead in establishing the Social Science Research Council (SSRC), modeling it explicitly on the National Research Council (NRC), which in conjunction with its parent, the National Academy of Sciences, undertook specific studies at the request of federal bureaus and Congress. Merriam had similar ambitions for the nascent SSRC, but intended to pursue them more aggressively than did the NRC. Consistent with his conviction that academic social science should be closely linked with governance, throughout the 1920s Merriam was also engaged in building a system of associations of local government officials. “The purpose of such an organization was to be the same as that for social science: exchanges of information, the creation of machinery for research, interchange and identification of personnel.”¹⁰

The National Planning Board

During the 1920s and early 1930s, particularly after the onset of the Great Depression, several state governors, including Franklin D. Roosevelt of New York, became aware and appreciative of Merriam’s efforts to place public administration on a more professionalized basis. During his 1932 campaign for the presidency and during his first weeks in office, Roosevelt sought the advice of a number of

⁹ Ibid., 148.

¹⁰ Ibid., 226.

academic social scientists known collectively as his “brain trust,” including, for example, Rexford Tugwell, Raymond Moley, and Adolph Berle. “Roosevelt,” as Merriam’s biographer notes, “could scarcely have avoided turning up Merriam.”¹¹ From the earliest days of the New Deal, Merriam had reasonable insider knowledge of the trends in the young administration through his Chicago friend and political ally, Harold Ickes, an old-line Progressive who had managed his unsuccessful campaign for mayor of Chicago and became Roosevelt’s Secretary of the Interior responsible, among other matters, for the newly created Public Works Administration.

The early years of the New Deal are perhaps best remembered for the large number of new, emergency bureaus that were created in an attempt to deal with the multiple crises of the Great Depression, and to establish mechanisms to assure that future, similar crises would be mitigated. Thus, the federal government assumed responsibilities for dealing with a far greater range of social and economic matters than had ever been envisioned, even by Roosevelt and his advisers during the fall 1932 election campaign.



Harold Ickes, FDR’s Secretary of the Interior, administered the Public Works Administration, and contributed importantly to the expanded role of planning in public administration.

A second, less widely appreciated innovation that emerged and solidified during the first two terms of the Roosevelt administration (1933–41) was to rely on planning as a tool for governance. Although the Hoover administration had introduced some measure of planning into government decision-making processes, the president himself believed that planning should result in programs, whereas Roosevelt sought to use it as a basis for government action.

During the first months of his administration, Roosevelt tried without success to tempt Merriam to assume a position within the government. Merriam was keenly interested in the application of information and expert knowledge as a basis for planning since his earliest days at the University of Chicago. He believed that information and expert knowledge, through planning could become essential tools for governance. Many of his ideas were adopted first at the municipal level, later at the state level. Now, Roosevelt took the first step in elevating the concept of scientific (i.e., *social scientific*) planning to the federal level, and in so doing convinced Merriam to become involved with the New Deal. In July 1933, on the recommendation of Ickes, Merriam accepted the president’s invitation to become one of three members of a new, non-governmental advisory committee: the National Planning Board.¹² The other two members were the president’s maternal uncle, Frederic Delano, a Chicago railroad executive and a member of the Federal Reserve Board during the administration of President Woodrow Wilson (1913–21), and Wesley C. Mitchell, who was then research director of the National Bureau of Economic Research.

¹¹ Ibid.

¹² Dupree, *op. cit.*, 354.

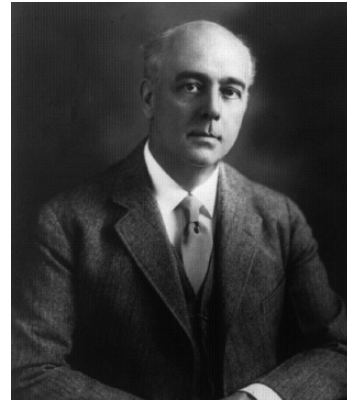
It is fair to say that although the three members of the National Planning Board were convinced that planning was essential to effective governance, they were not clear about the extent of their mandate. For their part, the president and his principal advisors were too consumed with emergency measures dealing with the devastation that had resulted from the Great Depression to focus on links between planning and longer-term measures. Given these circumstances, the board decided to seek external, non-governmental advice on how and what to plan. For example, in April 1934, it asked the National Academy of Sciences to prepare a report on the role of science in planning.¹³

The Science Committee of the National Resources Committee

The isolated position of the National Planning Board was at least somewhat mitigated in July 1934 when, at the initiative of Secretary Ickes, it was replaced by the National Resources Board, which in June 1935 became the National Resources Committee. Unlike the non-governmental National Planning Board, the new National Resources Board (and later Committee) was a governmental organization chaired by Ickes and with a membership that included the secretaries of several cabinet departments concerned with natural resources. The former three-member, non-governmental National Planning Board became the advisory committee to the National Resources Board/Committee.

Chaired by Secretary Ickes (who had received his political tutelage during Theodore Roosevelt's Progressive Era), the National Resources Committee's membership included the Secretaries of Agriculture, Commerce, Labor, and War, as well as Harry Hopkins, the Works Project Administrator. Frederic A. Delano, the president's maternal uncle, served as vice chairman of the full committee as well as chairman of its five-member, non-governmental working group. Prominent among the latter was Charles E. Merriam.

Evidently Ickes, no doubt on the advice of Merriam and his two National Planning Board colleagues, had concluded—and convinced the president—that national planning was most urgently needed to support federal initiatives in tangible, physical areas such as land, water, mineral, and power resources. Technical committees were appointed in each of these as well as other physical resources areas. Then, for reasons that remain unclear but were no doubt closely connected with the academic backgrounds of Merriam and Mitchell, the National Resources Board determined that the study of human as well as physical resources was within its mandate. In February 1935, the board invited the National Academy of Sciences, the Social Science Research Council, and the American Council on Education each to nominate five members to an advisory Science Committee to the National Planning Board. That the Social Science Research Council and the American Council on Education, in addition to the National Academy of Science, were each invited to nominate members of the committee, indicates that the board conceived of science broadly, to include the social as well as the natural sciences.



Frederic A. Delano, the president's maternal uncle, and vice-chairman of the National Resources Committee, proposed to FDR in 1937 "a study of Federal Aids to Research and the place of research in the Federal Government."

¹³ Ibid.

Edwin B. Wilson, a mathematical physicist who was then on the faculty of the Harvard School of Public Health, became chair of the science committee. During 1936, the committee focused its efforts upon population problems and the social consequences of invention. Then, early in 1937, it convinced Delano to submit a proposal to the president to study the “interrelations of government and the intellectual life of the nation, whether in research, in education, or in technology.”¹⁴ On July 19, 1937, the president approved Delano’s proposal for “a study of Federal Aids to Research and the place of research (including natural and social science) in the Federal Government,” emphasizing that “research is one of the Nation’s very greatest resources and the role of the Federal Government in supporting and stimulating it needs to be reexamined.”¹⁵

In view of Merriam’s interest throughout his career with planning and with making use of planning as a tool for governance, it was almost inevitable that *Relation of the Federal Government to Research*, the report that emerged from Delano’s proposal to the president, should have emphasized science—including both natural and social science—as tools for governance. Of course science had been used for governance since the earliest days of the republic as tools for carrying out the federal government’s Constitutional responsibilities. For example Thomas Jefferson, who served concurrently as the nation’s first Secretary of State and its first Patent Examiner, consulted a committee of University of Pennsylvania faculty in carrying out his latter duties. As another example, science was essential to the government’s responsibility to maintain standards of weights and measures.

However, these were piecemeal efforts. *Relation of the Federal Government to Research* was the first official government report to view the entire system of science in the federal government as a potentially significant tool for government. Significantly, it was the first official federal report to recognize the importance of establishing stronger links between the federal scientific enterprise and external, non-government scientific research resources.

Relation of the Federal Government to Research: Findings and Recommendations

Research: A National Resource, particularly its first volume, *Relation of the Federal Government to Research*, is a remarkable document for its time, in part because it was prepared under the auspices of a federal organization originally chartered to examine federal responsibility with respect to tangible resources such as water, reclamation, and soil conservation, for example. Since it was composed of nine non-governmental members, the Science Committee was sensitive to the importance of research in federal bureaus to research in non-governmental organizations—and vice versa. Accordingly, it took the first, albeit hesitant steps towards trying to define the elements of a national research policy in which the federal government would assume some measure of responsibility for—and possibly might even provide limited financial support for—research outside of government, including research in both the natural and social sciences.

Relation of the Federal Government to Research is well over 200 pages in length. The body of this report consists of a 16-page report of the Science Committee, which includes a 4-page Summary

¹⁴ Dupree, op. cit, p. 359.

¹⁵ Ibid., 360.

and Recommendations section, followed by a Supporting Studies appendix of over 200 pages compiled by Charles H. Judd.¹⁶ Prominent among these studies are those based on written questionnaires and interviews with over 50 federal bureaus involved in research in the natural and, prominently, the social sciences. These supporting studies also include over 50 pages on “The Legislative Branch and Research,” and 30 on “Research in American Universities and Colleges.” In particular, the report recognized the vital importance of the statistical data collected by various federal bureaus to social science research in academia—stressing not only that these bureaus alone had the scope and authority to gather and at least partially analyze socially relevant data, but that the education of students who lacked any contact with such “real world” sources of such data was at best sterile. The emphasis on the importance of federally collected data to contemporary social science implicitly recognized the pivotal importance to academic social science of the innovative work that Merriam and his colleagues had initiated in Chicago during the 1920s.

The importance of extensive and sound data was emphasized in a 35-page supporting study on “Problems of the Bureau of Census in their Relation to Social Science.”

The concluding 4-page “Summary of Findings and Recommendations” section of the 16-page report of the Science Committee itself indicates the breadth with which the committee viewed its charge. The section begins by noting the importance of science to governance.

From the earliest days of national history the Government of the United States has conducted scientific investigations in order to establish a sound basis for its legislative and administrative activities. Governmental agencies were pioneers in this country in carrying out research.¹⁷

From the perspective of the first decade of the 21st century, some of the more pertinent findings are:

4. Competition for research workers and the demand for large funds to support research have created a situation which calls for better coordination of the research facilities of the Nation than now exists.
11. The recruiting, placement, and in-service training of research workers in the Government are, under present conditions, less satisfactory than they might be.
14. The solution of the problems of the utilization of the research facilities of the country as aids to research in the Government is rendered readily possible by the existence of a number of national councils made up of the scientific specialists in the major lines of research.
16. It seems feasible to make more extended use than at present of the plan of entering into contracts with national research organizations to take charge of research projects.

¹⁶ National Resources Committee, *Research: A National Resource*, v. 1, *Relation of the Federal Government to Research* (Washington, DC: General Printing Office, Nov. 1938), 23–233.

¹⁷ *Ibid.*, 3–4.

19. International cooperation in scientific research now exists on a large scale. It could be encouraged to the great advantage of the Nation if the Federal Government would adopt the practice which is common among the Governments of other nations of according official recognition and, wherever necessary, financial support to international gatherings of scientists.

The report made several recommendations on the basis of these and other findings, including these:

3. That steps be taken to improve the methods of recruiting research workers for governmental service and to provide more effective in-service training for Civil Service employees of the Government.
4. That research agencies of the Government be authorized and encouraged to enter into contracts for the prosecution of research projects with the National Academy of Sciences, the National Research Council, the Social Science Research Council, and the American Council on Education, the American Council of Learned Societies, and other recognized research agencies.
7. That research agencies of the Government extend the practice of encouraging decentralized research in institutions not directly related to the Government and by individuals not in its employ.
8. That the interrelations of governmental research agencies be furthered by the organization of central councils along the lines followed by the existing national councils of research specialists. These interagency councils would serve to systemize the efforts which are now made by various interbureau committees to coordinate the research activities within the Government.

As implied by its title, *Relation of the Federal Government to Research* recognized at the outset that research within the federal government did not exist in a vacuum, but was dependent on research in non-governmental organizations, including those in industry and universities. It followed, in the view of the committee, that the federal government should assume some measure of responsibility for non-governmental research.

Almost certainly, a committee composed exclusively of non-government natural scientists would have welcomed the findings and recommendations of *Relation of the Federal Government to Research* that dealt with relations between the government and non-government organizations, including research councils and, by implication (recommendation 7), universities. However, any such committee of non-



The President's Committee on Administrative Management, 1937: (left to right) Louis Brownlow, Charles Merriam, and Luther Gulick.

government natural scientists would (and, following World War II, in fact) did proceed from the premise that the nation as a whole, as well as organized science, would benefit from government support for non-governmental science. In contrast, *Relation of the Federal Government to Research* proceeded from the premise, derived from the social sciences, that scientific research was an essential tool of governance. It followed that effective organization of science within the government's bureaus should be improved in order to improve the effectiveness of research for governance, and that research within the government's bureaus required that the government take greater advantage of the capabilities of the non-government research sector.

The recommendations of *Relation of the Federal Government to Research* concerning government relations with non-governmental research organizations seem timid, at best, from a 21st-century perspective. However, it is useful to recall that prior to World War II, the federal government rarely provided support for research outside of its own bureaus.¹⁸ Government agencies might, and often did, enter into contracts with companies to provide tangible products that required that those companies conduct research. Additionally, government agencies often retained university scientists as consultants on specific projects. But throughout the 1930s, there was no provision whereby the federal government could support research by individual scientists in non-government organizations, particularly in universities, with the notable although important exception of funding from the Department of Agriculture for research in the land grant colleges.

Relation of the Federal Government to Research: Supporting Studies

The more than 200-page "Supporting Studies" appendix to *Relation of the Federal Government to Research* was based on information and data provided by more than 50 federal bureaus that conducted and/or supported research by means of contracts with non-government organizations. Initially, information was gathered by means of a questionnaire, and later supplemented by extensive interviews.

The list of eight supporting studies provides an indication of the scope of *Relation of the Federal Government to Research*. The first was a 24-page study titled "Summary of Memoranda on the Research of the Federal Government in the Natural Sciences and Technology"; the second, an analogous 12-page study on research of the federal government in social sciences. There were also studies concerning "The Legislative Branch and Research," "Research in American Universities and Colleges," and "Problems of the Bureau of the Census in Relation to Research."

The first study on the natural sciences and technology began by listing three reasons why the federal government conducts research:¹⁹

There are fields in which the government is obliged to carry out research to fulfill its constitutional responsibilities (e.g., national defense, the determination of standards of weights and measures); to fulfill regulatory functions (e.g., traffic in foods and drugs and power production), and fields in which major problems have a decided national or interstate character (e.g., agriculture and weather prediction.)

¹⁸ The principal exception was the National Advisory Committee for Aeronautics (NACA) which supported some research in universities by means of contracts. Dupree, *op. cit.*, 283–87.

¹⁹ National Resources Committee, *op. cit.*, 25.

There are fields in which the federal government is better equipped to carry out research than is any other organization. Normally this category includes research that is significantly more expensive in proportion to its monetary return but is of high practical or social value. Examples include aeronautical research, public health research, and [significantly, given the auspices under which the report was prepared] soil conservation research.

There are fields in which the federal government is better equipped than any other organization to coordinate research programs. Specific examples given were: agricultural research . . . coordinated through State experimental stations, the method being that of cooperative agreement. Military research in which the War and Navy Departments keep themselves informed about developments in industry and . . . avoid duplication by making use of private facilities wherever possible. A third method is exemplified by the National Advisory Committee for Aeronautics, whose laboratory is a central research plant serving industry and Government alike.

This memorandum drew a number of conclusions from its studies, many of which were summarized in the “Findings and Recommendations” section of the 16-page body of *Relation of the Federal Government to Research*. It then went on to expand on federal research activities in the three sets of fields for which such activities were conducted.

The Impacts of Social Science in Government

The November 21, 1938, letter of transmittal from Secretary Ickes, acting in his capacity as Chair of the National Resources Committee, to the president of *Relation of the Federal Government to Research*, emphasized that, “The Federal Government has always played an important role in relation to scientific research, and in the last decade has expanded its activities, *particularly in the social sciences* [emphasis added].²⁰

The report’s supporting study entitled “Summary of Memoranda on the Research of the Federal Government in the Social Sciences” began by reiterating the emphasis that was to appear in Ickes’ letter of transmittal.²¹ It included a table on the growth of full-time federal employees in various scientific fields between May 15, 1931, and December 1, 1937. These data indicated that whereas the number of full-time civil service employees in economics, statistics, and political and social science had increased from 683 to 2,156, and in law from 1,515 to 3,149 during that period of time, the comparable number in agriculture and the biological sciences had only increased from 622 to 871, and those in the medical sciences from 250 to 311. The number of civil servants working in the physical sciences had actually exhibited a small, statistically insignificant decrease from 1,175 to 1,162. The only areas in the natural sciences and technology that increased significantly between 1931 and 1937 were in engineering and drafting: from 2,230 to 3,113.

The summary then went on to emphasize that unlike the situation in the natural sciences, academic research in the social sciences was heavily dependent upon information and data collected by various

²⁰ Ibid., Letter of Transmittal.

²¹ Ibid., 47–58.

federal statistical bureaus including, for example, the Census Bureau, the Bureau of Labor Statistics, and the Bureau of Agricultural Economics. Beyond that, the federal government was in close contact with all the major problems with which the social sciences deal. Thus, from the perspective of Charles H. Judd, the compiler of the summary, and his colleagues, a strong synergy existed between the needs of federal bureaus for statistical data, and those of social scientists to further their research, much of which would, in turn, be useful to those same federal bureaus:

It is quite certain that, if the action of the Government is to be wise and just, there must be at hand agencies which will give legislators and administrative officials reliable information. The process of securing this information calls for a high grade of trained ability to find materials which are buried in the archives or are obscure because human nature is complex and inaccessible to direct observation.²²

Relation of the Federal Government to Research is curiously lacking in hard data considering that its principal argument was the need to develop a national knowledge policy based on information and expert knowledge essential to governance. Most of the evidence presented has to do with personnel levels in various bureaus and, to some extent, expenditure data. A clue to this seeming paradox appears in a 34-page supporting study on “Federal Expenditures for Research, 1937 and 1938.” This study goes into considerable detail about the difficulties in obtaining sound estimates of such expenditures. For example, there was considerable confusion between expenditures for research and expenditures for administration. Data were scattered among the approximately 50 bureaus consulted by the staff of the science committee, and definitions among the bureaus was often inconsistent. This supporting study intended to argue that access to a centralized, consistent data base regarding not only expenditures for government research but other types of statistical information would be needed if the government were to develop and implement an effective and consistent research policy.

With the benefit of 70 years of hindsight, *Relations of the Federal Government to Research* may seem timid and flawed. Yet, for its time it was a remarkable document that argued, in effect, that research ought to be regarded as a national resource of equal or perhaps even greater importance than tangible, physical resources. In addition, it clearly recognized that the U.S. government’s own scientific bureaus—working in both the natural *and* the social sciences—existed within the larger context of a *national* research system, that the external system depended to a large degree on the federal system, and that the federal system, in turn, was highly dependent on the vigor of the external system.

Knowledge for Governance

Relations of the Federal Government to Research and the two succeeding volumes of *Research: a National Resource* (*Industrial Research* and *Business Research*) made a strong case for a national policy that would link knowledge—particularly scientific knowledge—to the problems of governance. In other words, it argued that the United States needed a comprehensive policy for linking science with the nation’s social and economic objectives. It went on to recommend several

²² *Ibid.*, 51.

steps to achieve that end, including expansion (and modification) of the federal contracting system to facilitate the support of university research in areas of clear national benefit.

Unlike many practitioners of the natural sciences, academic social scientists who joined the Roosevelt administration such as Tugwell, Moley and Berle, and those who served on its advisory committees such as Merriam, saw no conflict between academic research and government service. Indeed as already noted, the supporting document on social science appended to *Relation of the Federal Government to Research* emphasized that academic social science depended upon its relations with government to prosper, even as government bureaus depended upon insights from the social sciences to function effectively.

In view of these circumstances, it is not surprising that a government advisory committee charged by the president to examine “Federal Aids to Research and the place of research in the Federal Government” should have been dominated by social scientists. Nor, in view of their dominance, is it surprising that the first report of the National Resources Committee’s Science Committee should have recommended what qualified, in the Depression era, as a grand scheme for a national policy to link scientific process and knowledge to realization of the New Deal’s long-term social and economic objectives. In short, the science policy conceptualized in terms of a comprehensive strategy for using expert knowledge for the expanding responsibilities of government and, ultimately, for the benefit of the governed, was completely consistent with the intellectual milieu and mind-set of those social scientists, such as Merriam, whose primary interest was the nature of governance itself.

Altered Presidential Priorities

None of the recommendations of the Science Committee were implemented, at least not immediately. By the time that the second and third volumes of *Research: a National Resource* were completed—*Industrial Research* (December 1940) and *Business Research* (June 1941)—planning as integral to government had become a secondary priority to President Roosevelt. He and his principal advisers had become preoccupied by the war in Europe, convinced that the United States would inevitably be drawn into it. One result was that practitioners of the natural science disciplines achieved ascendancy over the social scientists as advisers at the highest levels of the federal government.

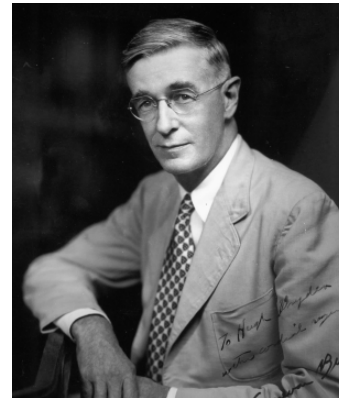
On June 12, 1940, 10 days before the fall of France, Frederic Delano arranged a meeting between his nephew and Vannevar Bush, former Dean of Engineering at the Massachusetts Institute of Technology, and at that time president of the Carnegie Institution of Washington. (Delano was on the board of trustees of that organization.) Three days later the president, by means of an executive order, created the National Research Defense Committee, naming Bush as its chairman. In July 1941, the president issued a second executive order that expanded Bush’s authority by naming him as chairman of the newly created Office of Scientific Research and Development (OSRD), with its scope expanded to encompass engineering development as well as scientific research,²³ and its chairman given direct access to the president. Roosevelt’s executive order establishing the new office stated that it was to

²³ The first prominent coupling of research with development (R&D), which has by now become commonplace, seems to have been made at the time that the OSRD was created.

serve as a center for mobilization of the scientific personnel and resources of the Nation in order to assure maximum utilization of such personnel and resources in developing and applying the results of scientific research to defense purposes . . . [and] to coordinate, aid, where desirable, supplement the experimental and other scientific and medical research activities relating to national defense carried on by the Departments of War and Navy and other departments and agencies of the Federal Government.²⁴

In November 1944, the significant accomplishments of the OSRD led Roosevelt to request the aforementioned report on the organization of science in the federal government in peacetime. The result was *Science—the Endless Frontier*. The requested report was transmitted to President Truman in July 1945 and served as one impetus for debates in the latter part of the 1940s about national science policy.²⁵ Bush, a political conservative, seems to have had a visceral antipathy towards the social sciences, in large measure because they had been closely linked, in the 1930s—particularly in Europe—with social engineering. In any event, he singled them out as unworthy of federal support stating, in his letter of transmission to the president that

It is clear from President Roosevelt's letter [requesting the report that was to become *Science—the Endless Frontier*] that in speaking of science he had in mind the natural sciences, including biology and medicine, and I have so interpreted his questions. Progress in other fields, such as the social sciences and the humanities, is likewise important; but the program for science presented in my report warrants immediate attention.²⁶



Vannevar Bush, president of the Carnegie Institution of Washington, was appointed in July 1941 as chairman of the newly created Office of Scientific Research and Development, with direct access to the president.

When, in May 1950, Congress finally enacted into law the centerpiece recommendation of *Science—the Endless Frontier* by creating the National Science Foundation, the new agency was given the mandate to initiate and support research “in the mathematical, physical, medical, biological, engineering, and other sciences,” with the social sciences lumped together into the latter, “other” category.²⁷ It was only in 1968, when Congress enacted amendments to the National Science Foundation Act of 1950, that the social sciences were specifically referenced in the legislation.

Aftermath

The national science policies of Charles Merriam and his social science colleagues on the Science Committee, and Vannevar Bush and the natural scientists, were fundamentally different. The rationale for *Relation of the Federal Government to Research* was to explore ways in which science—including social science—could be used more effectively as a tool for governance. One result of that

²⁴ Dupree, op. cit., 371.

²⁵ Bush, op. cit.

²⁶ Ibid., 1.

²⁷ National Science Foundation Act of 1950, Public Law 81-507 (64 Stat. 149), Sec. 3 (a) (1).

exploration was a set of recommendations that, if implemented, would also have led to closer relations between the federal government and non-government scientific institutions. In contrast, the rationale for *Science—the Endless Frontier* and the postwar debates about science policy was to explore ways in which science could be used for the public good, with national defense, in the years following the war, regarded as a major component of the public good.

Although the public good approach provided the principal rationale for the postwar science policy debates, the idea that science could also be used as a tool for governance had not been entirely abandoned. By the middle of 1946 it had become clear that the federal government was heavily involved in the support and conduct of scientific research and that that involvement was likely to grow. Although justifiably regarded as the cornerstone of U.S. science policy, *Science—the Endless Frontier*, as already noted, was never meant to serve as a blueprint for such a policy. To the latter end, on October 17, President Truman issued an executive order establishing the President's Scientific Research Board. Chaired by John Steelman, the Assistant to the President who literally served as Truman's chief of staff. The board's membership included the heads of all federal organizations with responsibility for research. Truman's executive order directed Steelman to review the current and proposed research and development activities within and outside the government. On that basis of that review, Steelman was to submit a report

setting forth (1) his findings with respect to the Federal research programs and his recommendations for providing coordination and improved efficiency therein; and (2) his findings with respect to non-Federal research and development activities and training facilities, a statement of the inter-relationship of Federal and non-Federal research and development, and his recommendations for planning, administering and staffing Federal research programs to insure that the scientific personnel, training, and research facilities of the Nation are used most effectively in the national interest.²⁸

The Steelman Board, in effect, was charged with updating the findings and recommendations of the Science Committee of the National Resources Committee. *A Program for the Nation*, the first of what were to be five volumes of the board's report entitled, *Science and Public Policy*, was released on August 27, 1947.²⁹ Due in large measure to the fact that the Congress was by then dominated by conservatives hostile to the president and any thought of government planning, the Steelman report had no discernable impact on the concurrent science policy debates. However, several of its recommendations were later accepted, albeit in somewhat altered form. Importantly, it reemphasized the need for government planning if effective use was to be made of federal scientific resources, as well as the need for close coupling between government and non-government research including some measure of federal support for the latter. Importantly, too, *Science and Public Policy* was the first government report to include a wealth of sound data on a range of matters associated with the nation's scientific activities and resources, and to use these data to make 10-year future projections of national requirements for financial and human resources for science and engineering.

²⁸ John R. Steelman. "A Program for the Nation." Volume 1 of *Science and Public Policy: A Report to the President*. (Washington, DC: GPO, 1947), 69.

²⁹ *Ibid.*

Protégés of Miriam, et al.

The influence on postwar science policy of Charles Merriam and his social science colleagues also survived through their protégés. In 1939, Congress accepted President Roosevelt's proposal to transfer the Bureau of the Budget (BoB) from the Treasury Department to the newly created Executive Office of the President, the rationale being that the BoB's closer proximity to the White House would better enable the president to get his arms around his administration. BoB Director Harold Smith regarded his agency as being guardian of the president's constitutional as opposed to his political prerogatives. Beginning in 1940, Smith brought to Washington several young men who were excited by the prospects of making contributions through service in the New Deal. In late 1944, as the end of World War II was approaching, it had become clear that the federal government was likely to become more heavily involved in both the conduct and support of science than in the prewar years.

A significant challenge facing Smith and the men such as Elmer Staats, Don K. Price, and William D. Carey whom he had brought to Washington, was how to devise administrative structures to accommodate science within government, and the support of scientific research by government, which were consistent with presidential prerogatives. These challenges were met and resolved, for example, in the creation of the Office of Naval Research in 1946, the Atomic Energy Commission, during that same year, the considerable expansion of the National Institutes of Health starting in 1948, and the creation of the National Science Foundation in 1950. The BoB's insistence on appropriate constitutional and administrative procedures as essential prerequisites to sound science policy occasionally clashed with the perception of some leading scientific elders that such procedures constituted undue interference by the federal government in the prerogatives of the scientific community. By helping to resolve such issues, Smith and these protégés of Charles Merriam and his colleagues had a profound influence on the structure, if not the content, of postwar science policy in the United States.

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