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THE NATIONAL ARCHIVES AND THE ADVANCEMENT OF SCIENCE[1]

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IT may be assumed that no explanation of the phrase "advancement of science" will be needed before this audience, though notice should perhaps be given that the word "science" as here used includes history and the social sciences. The word "archives," however, seems to have only a very vague connotation to most people and needs definition. The word is derived from the Greek *Archeion,* which means government house, and was at first applied only to the records and papers of a governmental agency. By analogy, however, it has come to be used for the accumulated files of an institution, a firm or even a family; but it should never be used with reference to a collection of historical documents, no matter how valuable they may be, that have been assembled by an agency rather than produced or received in the course of the transaction of its business or that of the government or institution of which it is a part. The term is not properly applied, moreover, to individual documents, but only to the entire mass or collection of records of a government or institution or one of its subdivisions. The singular form "archive" is not ordinarily used in English and should never be applied to a single document.

The national archives, therefore, comprise the sum total of documents, records and papers made or re-

[1] Address of the retiring vice-president and chairman of Section L—Historical and Philological Sciences, American Association for the Advancement of Science, St. Louis, January 2, 1936.

ceived in the transaction of public business by an official or agency of the national government and filed for preservation by or for the official or agency concerned. They include the papers of yesterday as well as those of a hundred years ago, inconsequential items as well as momentous documents, correspondence as well as treaties and statutes, typescripts as well as manuscripts, and in fact printed items if they have been filed for record purposes. There is no justification for the use of the word "archives" in the sense of old documents of special historical interest in contradistinction to files of papers concerned with the everyday transactions of the government. The expression "The National Archives" has recently acquired another meaning, however: It is the official name of the institution that has been created to have the custody of a part of the national archives in the other sense, especially that part that is no longer in current use in connection with the activities of the agency in which the documents were produced or received. Confusion between the two meanings of the expression can be avoided in writing by using capitals only when referring to the institution. This paper is concerned both with the national archives as a body of records and with The National Archives as an institution.

The history of the national archives is coeval with that of the nation. The records and papers of the Continental Congress, which were carefully preserved by its secretary, Charles Thomson, were properly transferred to the custody of the new government set up under the Constitution in 1789. Apparently little attention was paid to them until 1810, when a special committee of the House of Representatives, headed by Josiah Quincy of Massachusetts, reported that they were "in a state of great disorder and exposure; and in a situation neither safe nor convenient nor honorable to the nation." The committee recommended "the building of, at least, three additional fire proof rooms, within the building west of the President's house" to house these papers and the accumulating records of the State, War and Navy Departments; and Congress made an appropriation for the purpose.

Unfortunately this first "Archives Act" did not serve as a precedent for further legislation. Government agencies multiplied and their archives increased by leaps and bounds, but for over a century no archives legislation of a general character was enacted by Congress. Each bureau or office, as a rule, retained the custody of its own archives, non-current as well as current; though there was some concentration into departmental collections, notably in the State and War Departments; and a few groups, including the papers of the Continental Congress, were transferred to the Library of Congress. The bureaus, as a rule, manifested little interest in the non-current papers, and many of them were stored under conditions that resulted in their loss or irreparable damage by fire, water, vermin or thieves. In the period from 1873 to 1915 no less than 250 fires occurred in government offices in Washington, in many of which valuable records were destroyed. Vast quantities of older papers were also disposed of by officials to make room for expanding activities, often with little or no consideration of the possible value of these papers for historical or even for administrative purposes.

The problems involved in this situation were first brought formally to the attention of Congress in 1877, when President Hayes, in a special message, asserted that "the records of the Government constitute a most valuable collection for the country, whether we consider their pecuniary value or their historical importance" and urged legislation to prevent "their destruction or damage by fire." In 1878 and again in 1879 Hayes recommended "the construction of a cheap and perfectly fireproof building" for "the safe storage" of the records. Two fires that occurred in the War Department in 1880 and 1881 were probably responsible for the passage of an archives bill by the Senate in the latter year, but the House took no action. Again and again during the next thirty years the construction of an archives building was recommended by Presidents and cabinet officers and bills were introduced and sometimes passed by one house, but no law was enacted.

The prevalent conception of an archives establishment during most of this period was that of a warehouse for the storage of the records, and little consideration was given to problems of accessibility and administration. Historical scholars were beginning to bestir themselves, however. In 1899 the American Historical Association created its Public Archives Commission, which began to study and report upon archival problems and in 1909 inaugurated an annual "Conference of Archivists"; in 1904 the Carnegie Institution of Washington published the first edition of its invaluable *Guide to the Archives of the Government of the United States in Washington;* and scholars familiar with the opportunities for research in European archives began to ask why similar opportunities were not available in this country. As a result of continued discussion and agitation, it became clear that the primary reason for preserving the archives was to have them available to officials or scholars who might have occasion to consult them for administrative or scientific purposes and that a mere warehouse, no matter how safe, would not serve this purpose.

This new conception of an archives establishment as a functional agency and the realization that the records of the government had a scientific as well as an administrative and a sentimental value gave added

impetus to the movement for legislation, and in 1913 Congress authorized a study of European archives establishments and the preparation of plans and specifications for a fireproof building to cost not more than $1,500,000. The next few years were not propitious for an inspection of archives establishments in Europe, and the entrance of the United States into the world war shelved the project for the time being. After the war was over there were further delays, due in part to disputes over the site for the proposed building. In the meantime, however, records and papers accumulated at a greatly accelerated pace, the offices in Washington were overwhelmed by the problem of finding space for them, and the conception of the proposed establishment was further expanded. Finally in 1926 Congress appropriated $6,900,000 for an archives building, the site was selected, and intensive work was begun on the preparation of plans and specifications. The appropriation was increased to $8,750,000 in 1928, ground was broken in 1931, the corner-stone was laid in 1933, and the building, though still incomplete in some respects, was turned over to the government in November, 1935. It is expected that the transfer of records and papers will begin in the near future and that the building will be dedicated by President Roosevelt in the spring.

The National Archives Building of the United States is unquestionably the finest and best-equipped structure of its kind in the world. The delays made possible a thorough study of the problems involved, including the long-postponed inspection of European establishments; and the architects were thus prepared to avoid the mistakes of others and to take advantage of the latest developments in construction and equipment. Their fundamental objectives were to provide for the safety of the records and to make them as readily accessible as would be consonant with safety. The greater part of the building consists of a huge rectangle containing twenty-one levels of stacks and divided by fire walls and concrete floors into sections, each of which is three levels high and contains an office for a section chief. Each section is in fact an air-conditioned vault with temperature and humidity under complete control and fully equipped with devices for detecting fires or unauthorized entry. The stacks are of steel and are equipped with removable steel containers of convenient sizes for the storage of the documents. Completely separated from the stack area are an impressive exhibition hall on the front or Constitution Avenue side and the administrative offices, search rooms and reference library on the Pennsylvania Avenue side. The receiving room and the quarters for the cleaning, fumigation and other conditioning of the documents are in the basement, and a projection room and storage vaults for motion picture films and sound recordings are on the fifth floor.

The National Archives as an institution was created by act of Congress in June, 1934. The act provides for the appointment of an archivist by the President, with the advice and consent of the Senate, and sets up a National Archives Council, composed of the members of the Cabinet or their representatives, the chairmen of the Senate and House committees on the library, the Librarian of Congress, the secretary of the Smithsonian Institution and the archivist. To this council are given the functions of defining the classes of material to be transferred to the building and advising the archivist with reference to the disposition and use of the material transferred. To the archivist is given authority to make appointments to the staff (with the exception that all employees receiving a salary of five thousand dollars or over must be appointed by the President and confirmed by the Senate), "to inspect personally or by deputy the records of any agency" of the government, "to requisition for transfer" material within the classes designated by the council, and "to make regulations for the arrangement, custody, use, and withdrawal" of deposited material. The act also creates a National Historical Publications Commission consisting of the archivist and representatives of the State, War and Navy Departments, the Library of Congress and the American Historical Association, which is directed to "make plans, estimates, and recommendations for such historical works and collections of sources as seem appropriate for publication . . . at the public expense." The recommendations of this commission are to be transmitted to Congress by the archivist. The National Archives is further authorized to "accept, store, and preserve motion-picture films and sound recordings" of historical interest and to maintain a projection room "for historical purposes and study."

For the position of archivist, the President, on the recommendation of representatives of the American Historical Association, selected Dr. R. D. W. Connor, professor of history in the University of North Carolina, who had served for many years as the archivist of North Carolina. The appointment was made in October, 1934, and Dr. Connor proceeded to plan the organization and assemble a skeleton staff. The activities of the institution were classified in four groups, two having to do mainly with internal administration and two concerned primarily with external relations. Under the executive officer are the usual business divisions and, in addition, a division of photographic reproduction and research, which will play an important part in making the documents available to scholars throughout the country and may help to solve the problem of bulk by the use of micro-photography.

Under the director of archival service are the divisions of accessions, repair and preservation, classification, cataloging, departmental archives, maps and charts, reference, research, the library, motion pictures and sound recordings, and the *Federal Register*. The last of these is a division created by a special statute to receive from the various agencies of the government and to publish daily all proclamations and executive orders of general applicability and legal effect. The administrative secretary is charged with the conduct of official relations with agencies of the government and the public, including general correspondence, the supplying of general information to the public, the preparation of data for annual reports and budgets and the arrangement of exhibitions. He will also serve as secretary of the National Archives Council. The director of publications will be expected to compile and edit the official reference publications of The National Archives, such as guides, inventories and calendars; and, as secretary of the National Historical Publications Commission, to make plans and estimates for and to have general editorial supervision over the publications recommended by the commission and authorized by Congress.

Only a very superficial examination of the records and papers in the national archives is necessary to convince one that they are of inestimable value for purposes of scientific research. Moreover, in spite of the vast number of government publications, only a small proportion of the material of importance is available in print. The most obvious significance of the archives in relation to science, of course, is in the domain of history. Though it is generally recognized that they are "the first and foremost of all the sources of the Nation's history," the use that has been made of them by historical scholars is astoundingly small. They have long been recognized as essential to any thorough investigation in the political, diplomatic, administrative and legal history of the United States, but they have been so difficult to use that scholars have contented themselves, as a rule, with the incomplete and often unreliable material available in print. Their value for economic and social history has been considerable from the first and has been greatly increased in recent years as a result of the expansion of the activities of the federal government. Next to history, the social sciences could profit most by a greater use of the material in the national archives for research. The records of the activities of the government in its many manifestations are obviously raw materials for the student of political science, and their use in complete form instead of in fragmentary printed versions would in many cases enable him to get below the surface. Many data are accumulated by government agencies that bear upon the life of the people in their economic and social relations. Use is made of these data, of course, by the agencies concerned, and the results are usually published; but every scholar knows that data assembled for one purpose or in one connection are frequently of inestimable value in another connection.

That the government is engaged in a wide variety of research activities in the field of natural sciences is well known, and a number of those activities are being reported on or illustrated by exhibits at this meeting of the American Association for the Advancement of Science. Most of the discoveries and achievements are made known promptly to the scientific world, of course, but some of them, designed primarily for the use and benefit of the government itself, receive little or no publicity. The value for the history of science of the original records of scientific agencies of the government, some of which go back to a very early day, is obvious, of course; and here again there is always the possibility that observations recorded and data accumulated for one purpose may be useful for quite a different purpose. It has sometimes happened, moreover, that experiments and investigations have had to be discontinued because of failure of appropriations or change of policy before they could be completed, or funds have been lacking for the publication of the results achieved. In such cases, presumably, the data recorded or reports prepared, or both, have been filed away; and, if they could be made known and accessible to other investigators, either in or outside the government service, they might ultimately serve their original purpose.

It is hopeless, in view of the present condition of the national archives, to attempt any comprehensive survey of the materials in them of value for scientific research. Perhaps five or ten years from now, when the non-current archives may have been transferred to the custody of the archivist, classified and inventoried, and more space has thereby been made available for the better care of current records, a guide or series of guides can be prepared to all the material of interest to scientific investigators, with the information classified by sciences. A comprehensive presentation of the pertinent information now available in existing guides or to be inferred from knowledge of activities of government agencies would be impossible within the limits of this paper, but it may be useful to present some fragmentary memoranda concerning material in the archives of selected agencies of the government.

The State Department, in its thousands of volumes of correspondence with diplomatic and consular officers abroad and with representatives of other governments in the United States, possesses the fundamental documents for the history of American diplomacy and foreign policy; and only a small pro-

portion of them have been printed. Other activities of the nation and its people are reflected in long series of volumes of domestic and miscellaneous letters and in the early territorial papers, now fortunately being edited and published. In recent years, moreover, the department has concerned itself with scientific activities other than those of interest primarily to students of history and political science. It administers the contributions of the United States to international scientific agencies, makes arrangements for international scientific congresses held in the United States and provides for American representation in such congresses held elsewhere; and doubtless these activities are reflected in its archives. The reports from diplomatic and consular officers also contain considerable information about scientific research in foreign countries and other matters of interest to scientists.

The voluminous records of the Treasury Department are obviously of interest primarily to students of economics and economic history—more specifically of public finance and taxation; but its Bureau of Public Health Service engages in research on problems of disease and sanitation, administers hospitals and narcotic farms, regulates the manufacture and sale of viruses, toxins and serums, and enforces quarantine laws and regulations. The correspondence files of this bureau, which go back to 1872, and its other records should be of interest to students of medical history and other scientists. An extensive collection of formulae for medicines and remedies with alcoholic content, accumulated by the alcohol tax unit of the Bureau of Internal Revenue, is said to supplement the data in the United States Pharmacopoeia and similar publications and to be of considerable use to scientists and to officials in other bureaus and departments of the government.

The archives of the War Department have of course inestimable value for the student of military history, and much of the material, including such notable files as the records of General Headquarters in the world war, has not been generally available to historians. A number of the bureaus and services of the department, moreover, such as those concerned with chemical warfare and ordnance, have accumulated data for and records of research and experimentation; and others, such as the Surgeon General's Office, the Corps of Engineers, the Inland Waterways Corporation and the Bureau of Insular Affairs, have extensive records concerning non-military affairs of great interest to students of the natural and the social sciences and of history. The archives of the office of chief of engineers include, for example, over fifty thousand maps and charts, and many field-books, surveyors' notes and journals of expeditions. The files of two temporary agencies of the world war period, the Council of National Defense and the Committee on Public Information, both on deposit in the custody of the War Department, will have to be exploited before a definitive history of American participation in the war can be written.

The Navy Department, also, has, in addition to voluminous records of the war and peacetime activities of the navy and the marine corps, extensive records and data concerning experiments and investigations in the performance of guns, engines, ships and airplanes; drawings of naval vessels and engines; ship log-books of exploratory expeditions; and other non-military material accumulated by the bureaus of navigation, ordnance, engineering, aeronautics, medicine and surgery, and construction and repair, and by the Board of Medical Examiners and the Naval Observatory.

Of exceptional value for students of sociology and of public health and medicine are the archives of the Veterans' Administration. Here are to be found fairly continuous records extending over a considerable period of years of the circumstances of over five million men and their families. They are concerned with such matters as health, medical care, education, rehabilitation and employment; and they provide the raw data for a survey of the life of a large segment of the American people in prosperity and in depression. They include detailed medical histories of hundreds of thousands of cases.

The records of the Post Office Department, extending back to the beginning of the Federal Government, reflect not merely the activities of the department but also the improvement of roads, the development of stage-coach lines and other means of travel and transportation and the movement of the population as indicated by the establishment of post offices.

A number of the branches of the Interior Department, such as the Bureau of Mines and the Geological Survey, are primarily institutes for research in the natural sciences with special application to the resources of the country, and their archives are what one would expect to find in such institutes. The Office of Education is similarly a research agency in its field, with much material in its archives for the history of education. The extensive records of the Bureau of Indian Affairs are invaluable not only as sources of information on the history of Indian relations but also as materials for the study of ethnology and anthropology; and the General Land Office possesses tons of records of the surveying and disposition of the public domain—fundamental material for the study of the westward movement. An aspect of that movement, involving the application of scientific knowledge, is also illustrated in the records of the Bureau of Reclamation. The National Park Service

has in recent years accumulated much material concerning the scientific and historical aspects of the many parks, battlefield sites and national monuments under its supervision, and its administrative records should be of interest to the sociologist for the light they throw on the recreations of the people.

The multitudinous activities of the Department of Agriculture are also concerned largely with scientific research, and the archives of the bureaus of dairy, animal and plant industry, chemistry and soils, entomology, agricultural engineering and biological survey, the forest and soil conservation services, the Food and Drug Administration and the Weather Bureau include material of interest to natural scientists. The Weather Bureau files contain geological as well as meteorological data and also logbooks of voyages of early American vessels. Students of the social sciences will also find material of value in the records of these bureaus and services as well as in those of the bureaus of agricultural and home economics and of emergency wartime agencies such as the Committee on Cotton Distribution and the wool division of the War Industries Board.

The Department of Commerce, although a comparatively recent creation, includes a number of bureaus that have had a long existence and have accumulated vast quantities of records. Of outstanding importance to students of history, economics and sociology are the original schedules of federal censuses in the custody of the Bureau of the Census. Although some schedules have been destroyed and others dispersed, the collection is sufficiently complete to form, with the records of the Land Office previously mentioned, a veritable Domesday Book of the American people. Beginning in 1850 the population schedules contain the name of each individual with his age and country or state of birth; and, as the data are grouped by families, it is possible to derive from them not only biographical and genealogical facts but also reliable statistical information concerning family migrations and the origins of the population of any given region. The simple analyses and computations of the earlier censuses by no means exhausted the possibilities offered by the data in the schedules, and the time will come when students of economic, social, regional and local history will demand that these data be interpreted statistically as fully as have been the corresponding data of the more recent censuses. The work of the Bureau of Standards, including tests and investigations in connection with the establishment of working standards used in science, engineering, industry and commerce, and a wide variety of chemical, physical and metallurgical studies of raw materials and manufactured articles, is well known to natural scientists. Many of its data are confidential and the results of its studies are sometimes available only to the government or to the industries concerned, but it would seem that they could be opened to scientists and students of business in the course of time and would be of value to them. The importance for scientists and economists of the records of other branches of the department such as the bureaus of foreign and domestic commerce, air commerce, fisheries, navigation and steamboat inspection, the Coast and Geodetic Survey (the oldest research agency of the government), the Patent Office and the United States Shipping Board are obvious as soon as the agencies are named.

The Smithsonian Institution, including the Bureau of American Ethnology, the Astrophysical Observatory, the National Zoological Park and the National Museum, is concerned primarily with research in the natural sciences. Though supported in part by private endowments, it is a recognized agency of the government and its records are a part of the national archives.

Economists and economic historians will ultimately make extensive use of the records of such established agencies of the government as the Labor Department, the Interstate Commerce Commission, the Federal Trade Commission and the Tariff Commission, and of such innovations, whether permanent or temporary, as the National Recovery Administration, the various labor relations boards, the Federal Coordinator of Transportation, the Resettlement Administration, the National Resources Committee, the Tennessee Valley Authority, the Public Works Administration, the Works Progress Administration and the Federal Emergency Relief Administration. The voluminous records of the hearings held by the NRA and the AAA, constituting a cross-sectional survey of conditions and of opinions at the nadir of the depression, are now available in a number of institutions in the form of micro-film reproductions, as a result of the activity of the Joint Committee on Materials for Research organized some years ago by the American Council of Learned Societies and the Social Science Research Council. With so many temporary agencies of government set up outside the regular departments, special care is needed to insure the preservation of their archives.

In addition to the archives of the executive departments and independent agencies, there are those of the courts and of Congress. The records of cases in the Supreme Court, the Court of Claims and the lower federal courts, including petitions, evidence, briefs and decisions on all sorts of subjects, are valuable not only to legal historians but also to students of social, economic and even political history, and occasionally contain material of interest to the natural scientist.

The printed reports, voluminous though they are, by no means include all the material of interest to scholars, and the printed briefs are usually to be found only in the files of the courts. The records of Congress, known as Senate Files and House Files, also are very miscellaneous in subject-matter and have been printed in considerable part; but they include much valuable unpublished material, such as petitions and memorials, copies of documents the originals of which have disappeared from departmental files and records of committee hearings and transactions.

Enough has been said to make it clear that the body of records known as the national archives is of vital importance for the advancement of science on many fronts. It remains to consider briefly, in conclusion, the contributions that may be made to the advancement of science by the new institution known as The National Archives. Obviously these will be primarily along the line of promoting the preservation of the archives themselves, making their content and value known, and making them readily available to scientists wherever located. These results should be achieved not only for the material transferred to the custody of the archivist but also for that retained by the departments, in view of the authority given to the archivist to inspect the records of government agencies wherever they are and to make recommendations to Congress with reference to proposals for the destruction of supposedly useless papers. It may be confidently expected, moreover, that The National Archives will make many contributions to what may for convenience be called archival science. Certainly it will engage in research on problems involved in the repair, preservation, reproduction and utilization of documents and of film records; and its discoveries should tend to promote improvement in the treatment of archives and historical manuscripts in depositories throughout the country.

SCIENTIFIC EVENTS

A PROTEST AGAINST THE EXPLOITATION OF THE ROCKY MOUNTAIN NATIONAL PARK

A PROTEST has been issued by the following organizations concerned with conservation against the exploitation of the Rocky Mountain National Park: The National Association of Audubon Societies, Izaak Walton League of America, the General Federation of Women's Clubs, the American Planning and Civic Association, the American Forestry Association, the Garden Club of America, the American Wildlife Institute, the National Parks Association, the Society of American Foresters, the American Association of Museums, the National Conference on State Parks, the Massachusetts Forest and Park Association and the Wilderness Society.

The protest reads:

Believing that the National Parks, set aside for the use, enjoyment and education of the people of the United States, should be protected from commercial exploitation, we earnestly protest against congressional authorization of a project to dig a thirteen-mile tunnel through Rocky Mountain National Park, to transform Grand Lake into a reservoir, and to build some eight thousand feet of covered ditch within the park in order to divert water from the Colorado River watershed into the Platte River watershed.

We submit that the Grand Lake-Big Thompson Intermountain Diversion project, included by the Senate on March 2 as a rider to the Interior Department Appropriation Bill, has not been adequately investigated, has not been approved by the Budget Bureau, and has not been considered by the appropriate committees in either house of Congress.

Moreover, the Congress by amendment to the Federal Power Act has enunciated the policy that National Parks should be exempt from power projects. The scheme to divert the waters of beautiful Grand Lake and to tunnel through the heart of the Rocky Mountain National Park involves the development of power and the construction of unsightly power lines near the eastern and southern boundaries and across a scenic area which has long been contemplated for addition to the park.

In the building of the tunnel the disposition of debris will deface the landscape and leave a scar on the wilderness character of the park and its environs. We have no faith in promises to maintain the level of Grand Lake if water becomes needed for power or growing crops in dry years.

We submit that this project violates the most sacred principle of National Parks, namely, freedom from commercial or economic exploitation and that if approved by Congress it will establish a precedent for the commercial invasion of other parks. We urge that the American people rally to the defense of their National Park system and demand of Congress that this project be stopped.

CHEMICAL ABSTRACTS

IN a report of progress on the work of *Chemical Abstracts*, the editor, Professor E. J. Crane, of the Ohio State University, states that the total number of abstracts of papers describing original investigation in science and industry, together with abstracts of patents, aggregated 61,834 during the past year, an increase of 1,639 over the previous twelve months.

Biological chemistry was far in advance of all other fields, being credited with 10,486 abstracts. General and physical chemistry was second with 4,044, and organic chemistry third with 3,299. Articles number-