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ABSTRACT

A privately sponsored and privately funded committee was organized to identify and propose means by which governments at all levels might rid themselves of needless and wasteful records while ensuring the preservation of that fraction of the documents deserving to be kept. The committee concentrated on problems and solutions within the federal government, but the principles underlying the conclusions and recommendations can be adopted by individual states and localities. This report of the committee includes an introduction and sections on: Development of Records Management; Records Management 1950-1984; Computer Generated Records; Special Characteristics of Electronic Records; Information Resource Management; and Importance of Leadership. Five major conclusions and three detailed recommendations complete the report. A draft of a proposed executive order is attached as well as a list of participants and additional interviewees. Appendices include overviews of the government records programs and conservation efforts, a technology assessment report of the National Archives and Records Service, and additional information, including significant related legislation and regulations; selected surveys and studies; elements of a comprehensive government records program; principles for state archival and records management agencies; National Archives and Records Service appraisal guidelines; and examples of federal government records schedules. An index is provided. (THC)

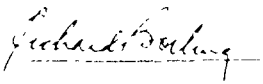
COMMITTEE ON THE RECORDS OF GOVERNMENT

REPORT

WASHINGTON, D.C.
MARCH 1985

COMMITTEE ON THE RECORDS OF GOVERNMENT

Sponsored by the American Council of Learned Societies, the Social Science Research Council, and the Council on Library Resources



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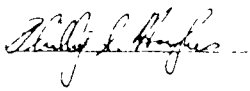

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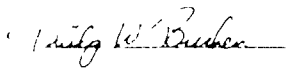

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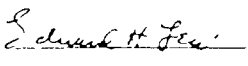

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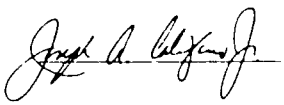

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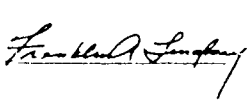

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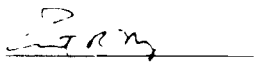

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REPORT

OF

THE COMMITTEE ON THE RECORDS OF GOVERNMENT

The United States is in danger of losing its memory

Our governments—federal, state, and local—already have lost control of paper records. Existing federal paper records, if stored in a single line of three-drawer filing cabinets, would stretch for a thousand miles. Buried within and currently unobtainable are the twentieth century counterparts of Madison's notes on the Constitutional Convention as well as the narratives of emancipated slaves collected by the Freedmen's Bureau.

Now governments are rapidly shifting to electronic recordkeeping. Today, because tapes and disks take up so little space, even more documents are being stored away, but with no provisions for identifying and preserving records of historical value. Meanwhile, potentially precious documents disappear as word processors erase old texts and substitute new ones with no human saying "Stop."

Even if someone does say: "Better keep that early draft," the document on tape or disk may become useless because of changes in technology. By the mid 1970s, when computer tapes for the 1960 census came to the attention of archivists, there remained only two machines capable of reading them. One was already in the Smithsonian. The other was in Japan!

Documentary treasures are threatened with loss and destruction. Despite the truth embodied in such phrases as "information revolution" and "explosion of knowledge," historical documentation is becoming progressively thinner. Because of erasures of electronic records, future historians may know less about the Reagan Administration's 1985 arms control initiatives than about those of 1972 which led to SALT I or, for that matter, those of 1921 which led to the Washington naval treaties. Although the condition of federal executive branch records is, with rare exceptions, deplorable, those of states, counties, cities, and towns are even worse.

Concerned about these conditions and conscious that the transition to electronic recordkeeping is still in its early stages, a consortium of organizations created the Committee on the Records of Government. These organizations are the American Council of Learned Societies, the Council on Library Resources, and the Social Science Research Council. Funding was provided by the Mellon, Rockefeller, and Sloan foundations with additional support from the Council on Library Resources. Thus, this privately sponsored and privately funded Committee was designed not to speak for any segment of government but to speak to governments at all levels on behalf of Americans at large, including millions yet to be born.

The Committee's mission was to identify and propose means by which governments at all levels might rid themselves of needless and wasteful records while ensuring the preservation of that fraction deserving to be kept. Because of time restraints, the Committee concentrated on problems and solutions within the federal government, but it is our belief that the report accurately reflects current problems at every level of government and that the principles underlying the conclusions and recommendations can and should be adopted by individual states and localities.

The conclusions of the Committee are as follows.

A. The federal government and state and local governments have huge quantities of paper records. These governments store totally valueless records haphazardly and at a high annual cost. At the same time, these governments are failing to create or retain records which would help them in their current business and permit future generations to reconstruct our nation's history.

B. The danger of losing historically valuable records is greatly increased by the changeover to electronic recordkeeping. Under current procedure, records created on tapes or disks are erased or lost before anyone exercises judgement about their possible value. In addition, given the rapidity of technological change, even information recognized as valuable can be lost because the equipment and skills necessary to retrieve it become obsolete or unavailable.

C. Responsibility for decisions regarding records and recordkeeping is fragmented and ill-defined. At the federal level, responsibility is divided among four groups. At present, no individual or agency can or will take action to remedy existing conditions. Similar fragmentation of responsibility exists in state and local governments.

D. Officials responsible for creating records should be made accountable also for the winnowing out or the preservation of those records of historical or other value.

E The executive branch of the federal government can set a model for all other branches and levels of government. There are no recordkeeping issues peculiar to state and local governments.

F A clearer delineation of responsibility can not only safeguard our documentary heritage, but also save money and improve government performance.

Specifically, we recommend the following:

1. President Reagan should promptly issue an Executive Order. It would accomplish the following:

   a The Archivist of the United States would be made head of a Federal Records Management Policy Council, with members representing the Office of Management and Budget and the General Services Administration. This Council would:
   - Assist in and oversee agency planning for records or data management and disposition and,
   - With the assistance of outside experts and appropriate public representatives, conduct periodic reviews of agency performance.

   b Subject to such oversight, each agency head would be made responsible for agency records, whether created on paper or electronically. This would include responsibility for getting rid of needless records; for reducing to a minimum the cost of records retention; for maintaining records needed for reference or accountability; and for identifying, preserving, and eventually transferring to the National Archives those records of permanent historical value.

   c To carry out these missions, each agency head and each senior agency manager would obtain staff assistance from professional historians or archivists.

2. With guidance from an Advisory Committee made up of illustrious private citizens, the Archivist should, in addition, expand the functions of the National Archives and Records Administration. The Committee suggests specifically that the Archivist:

   a Increase public awareness of and facilitate public access to the nation's documentary treasures, using for this purpose regional records centers and presidential libraries as well as facilities in the nation's capital.

   b Provide leadership for the nation and the world on research and development and testing of methods for managing, preserving, and retrieving government records and data.

c Organize the capacity for research in government records in order to provide reference services for other elements of the federal government, building up in the process a cumulatively valuable electronic data base.

3 The Speaker of the House and the leadership of the Senate should take similar measures, seeking advice, when appropriate, from the Archivist and the Records Management Policy Council.

4 The General Accounting Office should conduct periodic reviews of recordkeeping by Congressional committees and other agencies of the Congress and conduct periodic independent reviews of recordkeeping in executive agencies.

5. Governors, state legislators, and the government leaders of counties, cities, and towns should act as quickly as possible to copy the example of the federal executive.

Report

of the

Committee on the Records of Government

Introduction

Government officials and citizens often forget the extent to which records serve the public interest. Briefed by deputies and assistants, high-level officials often do not connect the information they receive with the contents of file cabinets or computers. Similarly, citizens usually concern themselves with records only when a government has misplaced a vital statistic or misdirected a check. In fact, the creation and preservation of government records is important for everyone. Records are a necessary component in the governing process because they perform a number of functions potentially affecting any person in a government position or within its jurisdiction. Government records:

1. Document the history and intent of public policy. Information contained in records provides policymakers in both the executive agencies and legislatures with information necessary for planning future programs, evaluating past performance, and assuring clarity and continuity in government policy.

2. Assure accountability to legislatures as well as the public through documentation of government programs. Records are used to document agreements and obligations, substantiate claims, and back up contentions. They contain information on taxation and on the management and expenditure of public funds. Committee offices in legislatures have the additional responsibility for records establishing legislative histories.

3. Retain basic data necessary for research on scientific, medical, and economic problems. Medical researchers, for example, use records to understand the nature of disease or the course of epidemics. Statisticians use records for economic projections; astronomers keep records of events that will not recur for generations.

4. Assure the effective administration of ongoing public programs such as federal payments to veterans, farmers, or Social Security recipients. Records document the delivery of government services, show legal responsibility, and support the rights both of individuals and governments.

5. Assure effective administration within government agencies. Housekeeping records, including personnel budget, and procurement records, are essential to every agency or office and provide accountability for public funds.

6. Form the basis of a national history and an understanding of American government. Local, state, and federal archives also contribute to a sense of community, a national consciousness, and understanding of our society and culture. Without records, there is no history. Without history, there is no understanding of continuity and change, no national consensus to support government, and little or no appreciation for the impact of present policy upon the future.

Throughout history, governments have kept records to support their needs and activities. Ancient societies, like their modern counterparts, found it necessary to keep financial and accounting records, land records to determine tax obligations, and records of evidence of past administrative action. Excavations near the Euphrates River revealed extensive collections of records dating from 1800 B.C.

The French Revolution marked the first establishment of a government repository that allowed public access to the records. The Archives Nationales, established in 1789 as a parliamentary archive, developed into a central archive establishment with a view to serving citizens who wanted documents for legal purposes. Aided by the rising tide of nationalism and the need for a national history to support it, the idea of public archives gradually spread to other European countries.

Although the first state archive was not established until 1901, and the United States has had a national archives system for only fifty years, the importance of records was appreciated from the beginning of the American nation. Colonials, from the first days of settlement, were interested in preserving records pertaining to their lives as landowners, taxpayers, and litigants. More often than not, however, interest in preserving records throughout the early years of the republic was thwarted by the failure to provide proper housing. Records at all levels of government often were lost through fire as well as neglect.[1]

The First Federal Congress concerned itself with procedures for proper documentation and for the retention of those documents. The House of Representatives, reflecting the growth of national consciousness, established a committee in 1810 to investigate the state

[1] For a brief description of U S records and archives before 1934, see H G Jones, *The Records of a Nation* (New York Atheneum, 1969), Chapter 1 Also, see Ernst Posner, *Archives in the Ancient World* (Cambridge, Mass Harvard University Press, 1972)

of "Ancient Public Records," primarily those of the Confederation period that had come to a close less than twenty-five years before. The accumulation of records after the Civil War led to the first public suggestion that the government could actually discard some records, especially since they constituted a fire hazard. The increasing accumulation of records slowly turned the attention of government officials from "recordkeeping" to "records management."

It was the concern with efficiency that led the federal government to the General Records Disposal Act of 1889. Thereafter, every private or public group concerned with government efficiency has addressed the issue of managing government records. The Committee on Department Methods established by Theodore Roosevelt in 1905 concluded that outmoded record making and recordkeeping contributed to delay, increased costs, and inefficiency. It suggested that records no longer useful but historically important be placed in a "National Archives House." The Taft Commission that followed studied correspondence practices, forms, reports, and records retirement and the Bureau of Efficiency (1913–33), established in the era of progressive reform, also did some work on records management.

But while management and efficiency experts could call for good records management practices, they had no plan for separating the useful from the useless, the wheat from the chaff. That had to await the establishment of a National Archives system and a government commitment to preserve within it historically valuable records.[2]

Development of Records Management

When the National Archives building was finally opened, it was estimated that the national government had accumulated approximately ten million cubic feet of records over the previous century and a half. The building began to fill with documents. Some extended back to 1791. Others were semi-active records from recently created New Deal agencies. Although a survey of federal records completed in 1939 revealed the preponderance of traditional paper records, there were thousands of feet of motion pictures and photographic negatives.[3]

The size of the National Archives building in 1934 was so imposing that one observer suggested that "less than fifty percent of its ultimate capacity will be required during the first fifty years."[4] However,

[2] Artel Ricks. *Records Management in the Federal Government: An Analysis of the Adequacy of Law and Executive Policy.* Unpublished thesis. The George Washington University, 1974, Chapter II.

[3] For a more detailed description of the development of archives and records management, see Appendix I

[4] "Notes and Documents," *The Canadian Historical Review*, 16 (December 1935) 408

after the United States entered World War II, the fledgling staff at the National Archives faced the prospect of receiving an unmanageable mass of unorganized records. At the same time, the Archivist of the United States, Solon J. Buck, took the view that archivists should be involved in the entire "life cycle" of a record from its creation to its ultimate destruction or preservation, to insure that government activities would be adequately and permanently documented.

In the ensuing decade, the staff of the National Archives began to develop the principles of records management to insure that valuable records were retained as others were destroyed. Facing a "torrent" of records, archivists understood that the costly, labor-intensive work of arranging records and preparing them for use would be greatly simplified in the future if "records were better made, filed and maintained in the creating agencies." They believed that good records management would also result in more effective administration, more efficient use of space, and hence, cost effectiveness. But the major consideration of archivists who developed procedures for the administration of current records was that it would facilitate the appraisal process and assure that the proper records reached the public archives. Archivists in the National Archives therefore came to promote comprehensive programs of "records administration."[5]

Provisions of the Federal Records Disposal Act of 1943 reflected these innovative solutions to records management. The definition of a record was broadened and criteria expanded for determining those records to be preserved. The most important section of the Act provided for separating the useful from the useless through the creation of records "schedules." First, archivists would study individual agencies in order to understand their policymaking and administrative framework. Then they would examine the records produced by each agency and assess their value on the basis of established guidelines. From that evaluation, they would determine which categories of files could be destroyed and when. File categories deemed permanent were to be sent to the National Archives. By scheduling categories of files, agencies could dispose of useless material in an efficient manner and archives could be assured of records worthy of preservation. A system of scheduling records remains the heart of records administration in all public archives.

As archivists evaluated the records of agencies, they discovered categories of records (personnel, budget, etc.) that were common to all agencies. "General Records Schedules" were developed for these records and in 1945, an amendment to the Federal Records Disposal Act provided for the implementation of the schedules. The National Archives did not invent the concept of schedules, but creating the "general records schedule" and applying it to records common to all government agencies was a new approach that promised an efficient system for disposing of housekeeping and administrative documents

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Jones, 27

while assuring the preservation of documents of more enduring value. In addition, the Archives began encouraging the appointment of agency records managers and advocated their supervision of such administrative functions as correspondence and files management.[6]

In 1947, the first Hoover Commission (Commission on Organization of the Executive Branch of the Government) concerned with the more effective organization and management of the federal government, established a task force on records. The task force report noted that the making and keeping of records was among the most expensive of government housekeeping functions, largely because they were administered in an inefficient and expensive manner. To remedy this situation, the task force recommended the establishment of a federal records administration that would include a national archives and the enactment of comprehensive legislation for a federal records management program.[7]

The agency that finally emerged in 1949 from the resulting government reorganization was the National Archives and Records Service (NARS). The Archivist retained his traditional authority over records management, but all of NARS was then placed within the General Services Administration (GSA), the newly established housekeeping agency. This reflected the growing assumption that records management primarily was useful for efficient disposal and cost-effective administration.

Comprehensive legislation took shape with the passage of the Federal Records Act of 1950. This Act expanded the definition of federal records and directed the heads of federal agencies to keep adequate records of their organizations and run efficient records management programs. Mindful of information in the Hoover Commission Report that federal agencies had enough records in their possession to fill six Pentagons, the Act also established Federal Records Centers for the inexpensive storage of non-current records. A Records Management Division was established in NARS, and the administrator of General Services was given the authority to inspect agency records management processes to assure compliance.[8]

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[6] For a detailed discussion of the impact of National Archives staff on records management, see Donald R. McCoy, *The National Archives, America's Ministry of Documents, 1934–1968* (Chapel Hill: University of North Carolina Press, 1978), 146–247. A complete list of important legislation pertaining to federal records can be found in Appendix III of this report.

[7] McCoy, 221.

[8] McCoy, 236–37. Federal records are defined as "... all books, papers, maps, photographs, machine readable materials, or other documentary materials, regardless of physical form or characteristics, made or received by an agency of the United States Government under Federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the Government or because of the informational value of data in them." The Act was introduced ... in the House of Representatives by former Congressman Richard Bolling (D-Mo.), currently a member of the Committee on the Records of Government (CRG).

The Records Disposal Act of 1943 and the Federal Records Act of 1950, which emphasized the records management function, influenced the development of records management in several states. There is still a considerable variation among the states for placement of records management. In some states, records management is a responsibility of the archival agency. In others, especially those that combine the archival function with those of a state historical society, records management is part of an administrative agency. However, every state followed the model set by the Records Management Division of the National Archives. Records managers were placed in agencies, records schedules were developed, and records centers were established for non-current records. Unfortunately, the statutory base for enforcement, as well as the resources for implementation of records management, rarely kept pace with the growth of government agencies.

Records Management 1950–1984

There is general agreement that records management techniques frequently have been successful in rationalizing housekeeping and administrative records. File systems, records schedules and efforts to educate personnel through seminars, pamphlets, guides, etc. have led to gains in efficiency and effectiveness. There is now a professional organization for records managers, and a continuing effort through symposia, workshops, and handbooks to improve the situation.[9]

Overall, however, the current system of records management has failed to solve the problem of organizing, maintaining, and retrieving proliferating records. Executive agency records, in particular, have overwhelmed the system and resources assigned to manage them.

Problems inherent in the current system are aired in a report issued by the Joint Committee on Archives of Science and Technology (JCAST). Taking note of the central importance of the federal contribution to science and technology, the report carefully distinguishes between the ideal process of records management and the current reality. First, the report describes the way in which the federal records system "is supposed to work." Highlighting the division of responsibility, the report points out that agencies are responsible for records, but the General Services Administration (through the National Archives) has statutory responsibility for drafting guidelines and monitoring the performance of agencies to assure compliance with the law. When agency records become outdated, they are supposed to be "evaluated against records schedules"

[9] Interview. Able Carder. Chief. Documentation Management Branch. Eugene Reed, and Ralph Secrest. Department of Health and Human Services. December 9. 1983 Interview. Gregg Bradsher. Washington National Record Center. December 7. 1983 Interview. Jane Benoit. Records Manager. Department of Agriculture, September 23. 1983

that were written by agency records managers and approved by personnel in the records division of NARS. Records of long term value are then presumably transferred to the records centers, remaining under agency control until formally transferred to the National Archives. But the authors of the JCAST report note that this procedure is rarely implemented. In fact, "records that document the major plans, programs, policies, and technical achievements or failures of agencies frequently do not get identified, processed, and preserved."[10]

They note a number of reasons. The records are voluminous and agency records officers are few. The application of records schedules to every office is an impossible task. Records managers are usually so low in the organization that they never see the more important documents, and in the case of scientific and technical records, cannot always understand the ones they see. In addition, the JCAST report points out that the official agency records management division, that part of the agency that is responsible for transferring records to the records centers and the National Archives, "frequently has an indirect or incomplete relationship to the offices that create or take action on the most important agency programs." Thus, in the words of one government historian, documentation tends to be very thin "at the top."[11]

Military records of the Vietnam War, the first war fought in the age of both the copying machine and the computer, also illustrate most of the problems inherent in the current structure of records administration.

All of the services were concerned with recording their activities in the war. As a result, a "massive paper trail" now leads to records scattered across the United States, from the Washington National Records Center to the Albert F. Simpson Research Center at Maxwell Air Force Base, the U.S. Army Military History Institute at Carlisle, Pennsylvania, several Presidential libraries, and various non-government repositories.[12]

Since each agency in the federal government is responsible for the creation and maintenance of its records, each of the military services has its own particular system for recordkeeping, in spite of the seeming uniformity imposed by the rules and regulations implementing the federal records acts. In addition, each service manages and con-

[10] *Understanding Progress as Process*, Final Report of the Joint Committee on Archives of Science and Technology, 1983 (hereafter JCAST Report), 14. This report was distributed by the Society of American Archivists.

[11] JCAST Report, 14. Interview, Jack Holl, Historian, Department of Energy, November 29, 1984.

[12] The following information on records of the Vietnam War can be found in Ronald H. Spector, *Researching the Vietnam Experience*, (Washington, D.C.: Analysis Branch, U.S. Army Center of Military History, 1984), 1–5.

trols its records differently. The Navy continues to use a "unique records system" that has been in place since World War II, with broad authority for records policy placed with the chief of naval history and the director of the Marine Corps historical division. Army and Air Force records systems evolved and changed as the war progressed, with the adjutant general the ultimate custodian of Army records, and a decentralized records system prevailing within the Air Force.

In the early years of the Vietnam War, overworked Army unit commanders neglected recordkeeping for more immediate problems. The failure to keep proper records was revealed by the board investigating the My Lai massacre. Board members added an annex to their report noting the fact that useless records had been kept while important records were missing. As a result of the realization that records management had broken down, records managers were prevented from destroying any records related to Vietnam. The result as described by one historian was the accumulation of masses of "trivial and ephemeral" material.[13] Army records alone occupy over 50,000 linear feet at the Washington National Records Center at Suitland, Maryland, but they illustrate the fact that the quantity of modern records does not necessarily ensure proper documentation.

The situation is no better at the state level. Generally deprived of sufficient resources to fulfill their statutory responsibilities, many state archivists have only a general estimate of the number of state government records outside of the archival system. In some states, less than a third of the agencies have even been touched by current records management procedures. Other state archivists acknowledge that weak agency liaison is the rule rather than the exception in their programs. In many instances, state agencies simply keep their own records. In Pennsylvania, for example, the records center reported that of the four thousand series of records scheduled for transmittal, only twelve hundred were actually in the records center. Discussing this issue with the Committee, one state archivist stated unequivocally that most state records either are not preserved or are preserved by accident.[14]

Thus, many factors account for the present unsatisfactory conditions concerning government records. Top officials, their assistants, and budget officers, understandably occupied by the daily work of the agency, have paid less and less attention to recordkeeping. Competition for resources has reduced budgets for this function. Records managers have come to occupy relatively low level positions within agencies and many have lacked training. Increasingly, records managers implement schedules pertaining to administrative and periph-

[13] Spector, 3

[14] Edwin C. Bridges, "Consultant Report: State Government Records Programs," *Documenting America*, National Association of State Archives and Records Administrators (NASARA), 1983, 6. CRG/NASARA Meeting, May 4, 1984

eral programs while important programmatic and policy records remain outside the system.

In addition to these difficulties, other forces undermined the efforts of records administrators. First, government programs expanded at an unprecedented rate. Beginning in the late 1950s, the federal government, for example, initiated an increasing number of programs in health, education, housing, transportation, environment, and energy. Many of these programs were implemented by state and local governments, causing an unforeseen growth in local and state agencies and their bureaucracies. As a result, the number of public employees in state and local government tripled in the twenty-five years between 1950 and 1975.[15]

To provide for these new programs and initiatives, there has been an unusual amount of functional reorganization of government agencies. Six new cabinet-level departments have been added to the federal executive since 1950. In the process, agencies were often shifted intact so that several of the new departments remain highly decentralized. One recent estimate suggested that at least 200 different offices in the federal executive branch were concerned with health, 145 with energy, and 190 with environment.[16]

With increasing numbers of high officials serving shorter periods in public office, there is little opportunity to develop a sense of continuity or of responsibility for documentation in a representative government. In addition, there is evidence that with the proliferation of programs came an increased layering of appointed executives. For example, the Labor Department, one of the smallest departments in the federal establishment, had only one undersecretary and four assistant secretaries in 1960. By 1976, there were an undersecretary, three deputy undersecretaries, and six assistant secretaries.[17]

The proliferation of programs, agencies, and top officers points up the fact that government functions have become much more complicated and complex. In addition to the sheer volume, government records of the last three decades clearly reflect this complexity. For example, records centers house massive numbers of case files, reflecting the litigious nature of our society, the development of civil rights divisions in several agencies, and the work of agencies such as

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[15] U S Bureau of the Census, *Statistical Abstract of the United States 1982–83* (Washington, D C Government Printing Office, 1982), 303

[16] Hugh Heclo and Lester M Salamon, editors, *The Illusion of Presidential Government*, (Boulder, Colorado Westview Press, 1981), 6 On December 11, 1984, *The Washington Post* reported that President Ronald Reagan was considering further reorganization of cabinet departments

[17] Hugh Heclo, "Issue Networks and the Executive Establishment," *The New American Political System*, Anthony King, editor, (Washington, D C American Enterprise Institute for Public Policy Research, 1978), 112–14

the Equal Employment Opportunity Commission. The Department of Housing and Urban Development keeps files on the occupancy of public housing that long predate the establishment of the department. Granting agencies as disparate as the National Institutes of Health and the National Endowment for the Arts have accumulated massive collections of applications and proposals.

Statistical records also proliferated as a result of government programs. These records as well as scientific and technical records from agencies such as the National Aeronautics and Space Administration, the Defense Department, and the National Oceanic and Atmospheric Administration were not textual records on paper but computer-generated records stored on magnetic tapes, whose properties were not always clearly understood.[18] The worldwide commitment of military and economic aid and other massive programs for national security that followed the Cold War not only added disproportionately to the mass of federal records but also brought enormously complicated problems related to the protection of secret information. Indeed the perception on the part of many officials at every level of government that everything they say, do, or write will be exposed through the freedom of information acts may have discouraged some recordkeeping, and has almost certainly discouraged consignment of sensitive material to central files.

The importance of managing records had an unintended byproduct, the changed character of archival systems. Gradually, a line came to be drawn between archives and records. The latter were current and useful; the former were old, and largely of interest for historical reasons. This division led to greater isolation of archives and archivists from governmental processes, and ironically, made it more difficult for archives to receive records of enduring value--the original purpose of records management.

As efficient records management became more and more important to administrators promoting good management practices, there was a reluctance to entrust it to archivists. The second Hoover Commission (1954–1955) again suggested that records management be taken from the National Archives and Records Service, since the latter was concerned with history rather than with operational matters. Many state archives, especially those established by state historical societies, were divorced from the new records management agencies. Wherever state archives did control records management, they found themselves facing the same problems as the National Archives: low budget, lack of commitment from top officials, and a rapidly changing bureaucratic environment handicapped

[18] Interview, John Harold, Department of Housing and Urban Development, October 4, 1984. Agencies producing scientific, technical or statistical records on computers had a proprietary interest in keeping some of them but not necessarily scheduling or sending them to NARS

their efforts and served to discredit archival control. More often, records programs were simply "buried in the bureaucracies of larger departments." Peripheral to the primary functions of the organization, the records programs languished from "disinterest and lack of support of departmental administrators."[19] Conflict developed between managers and administrators who sought to control records management, and archivists who sought to gain, or at least retain, authority over the "life cycle of records."[20]

Many archival administrators contributed to their isolation by an increasingly narrow perception of their role in government. Concentrating on internal organization and chronically underfunded, they were caught in a circular conundrum: the failure to convince agency heads and legislators of the importance of records and archives contributed to the low budgets and increasing isolation that in turn led to further official disregard and perhaps even lower budgets.

In addition, when the leadership of public archives sought a larger role in records management, they faced a conflict of purpose that has not yet been resolved. Were public archives cultural institutions fulfilling a local or national purpose, providing accountability for public policy and programs and devoted to historical purposes in the broadest sense, or were they housekeeping institutions managing files, correspondence, and forms until no longer needed? If the archival institutions were not involved in the process of deciding between the wheat and the chaff, there would be little of value in the archives. If they were involved in management, then staff and resources could bog down in the details of office procedures and lose sight of the larger purpose.

There is evidence that strong leadership, fresh ideas and a concerted effort to emphasize the importance of public records can dramatically improve both records management practices and the administration of archives. New York, a state that established an archival system only in 1971, now has archival administrators reaching out to both government and community to achieve better support for relatively new programs. A recent brochure pointed out that nearly 2,000 reference requests were received from state officials in 1983 and that the "primary client of the State Archives is the government itself." At least one state, Kentucky, that had no building to house its non-current records in 1960, now has one of the most dynamic programs in the country. Its evolution points to the steps necessary for the development of such a program: the appointment of an archivist chosen for professional rather than political reasons; the development of a highly professional staff that achieved both technical expertise and a more mature management

[19] Bridges, 2

[20] Ricks, Chapter V. Also see NASARA Statement, Appendix III

style: the creative discovery of income sources independent of the budget cycle: and the development of constituencies within the state for support of public records. A measure of citizen interest is that in 1972 only fifty people walked into the state archives in Kentucky, whereas twelve years later 6 000 people came through the doors.[21]

To summarize, in the history of our paper records, the first problem was simply one of finding adequate and secure storage space. Overflowing records centers and archival institutions illustrate that this remains a major problem even today. One result of this problem is that the current system of organizing and providing access to these records has been overwhelmed. Although the Federal Records Act provides for thirty-year-old records to be placed within the National Archives, that agency will not officially take records under its jurisdiction unless they have been arranged and described. But the systematic identification and processing of records of value from the vast collections of executive documents in records centers is labor intensive and hence very expensive. Therefore, most of these records continue to be largely inaccessible.

Meanwhile, in the last fifty years, the initial problem gave rise to a second one: how to achieve and maintain efficiency in government operations while at the same time preserving records important for historical or other public purposes. As governments grew, it became harder for individuals to deal with both current programs and the records they produced. As administrators faced the problem of relating records management administratively or bureaucratically to the functions of an agency or office, managing records increasingly was isolated from their creation and operational use. The passage of freedom of information and privacy acts created further organizational problems, as yet another record-related function had to be accommodated.

Computer-Generated Records

While the advent of the computer began to make physical storage a less severe constraint, it has thus far complicated rather than eased other problems relating to records. The federal government entered the computer age with the purchase of the UNIVAC by the Census Bureau in 1951. Twenty-five years later, it was estimated that 7,500 computers were in place, and automated data processing (ADP) became essential to modern government as well as modern business. In January 1984, the federal government had between 18,000 and 19,000 computers in over 4,000 sites around the world.[22]

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[21] CRG/NASARA Meeting, May 4, 1984 *Our Number One Client is State Government*, brochure from the New York State Archives

[22] *Government Computer News*, January 1984, 20, September 1984, 20, Charles Dollar, "Machine Readable Archives . Records Managers Neglect Automation Files." *Records Management Journal*, 13 (Winter 1975) 3, David Burnham "Calculating the Cost of Government by Computer." *New York Times*, April 17, 1983 No comparable statistics are available for state governments

Technology in the 1950s and 1960s carried governments toward the purchase of powerful mainframe systems which were very expensive but capable of handling volumes of data far beyond human capability. The expense of these original computers led to the establishment of highly centralized computer organizations staffed by skilled specialists. By the mid-1960s, the need for planning centralized systems for data processing led Congress to give the Office of Management and Budget and General Services Administration strong government-wide authority over automated data processing policy and systems.[23]

As early as 1963, the Social Science Research Council (SSRC) Committee on the Preservation and Use of Economic Data expressed its concern for the data stored on magnetic tape and punch cards by various agencies. The National Archives responded by establishing a Data Archives Staff in 1969. This staff began preparing General Records Schedules for data files and a handbook on storing computer tapes. The Data Archives Staff evolved into a Machine-Readable Archives Branch in 1974. Among its duties was the preparation of records schedules for computer tapes and the publication of a catalogue describing them. Machine-readable records, by definition, records created by computers, also required computers to use the information. Unlike other records, the researchers provided the equipment for "reading" the material.[24]

In spite of all the difficulties with hardware, software, and accompanying documentation, a machine-readable branch of the National Archives with a staff of 16 was a feasible answer to 7,500 mainframe computers. Largely concentrating on the preservation and use of automated data, archivists saw little reason to modify basic records management or archival techniques for this new form of documentation. Policies for automated data processing developed by the National Archives were regarded as a model for other public archives and were adapted by the Canadian Archives and many states.

But even as the Machine-Readable Branch was put into place, data processing was undergoing continuous and rapid enlargement. Literally billions of transactions—including the processing of Social Security checks, income tax returns, Treasury receipts, and disbursements—were handled by computers. Meanwhile, computers became crucial components of research and development in science and engineering. Computers also began to play a role in management. Planning, analysis, program and procurement control, auditing, inspection, and law enforcement, for example, became dependent upon automated processes.

[23] Although it is difficult to generalize about the states, ADP policy was handled much the same way by most state governments

[24] Dollar, "Machine Readable Archives ," 4

With extraordinary rapidity in the last few years, new technology placed fast, powerful computers into small, relatively inexpensive packages. In addition, there are probably over 200,000 personal computers now in use at all levels of government, a figure expected to increase to several million by the year 2000. Some estimates show as many as eleven million computer tapes currently in federal agencies, and an unknown number in the agencies of the fifty states.[25] Freestanding and local area networks provide the means to communicate through terminals what once was circulated through written memos. Among other things, these microcomputers and personal computers have totally changed the kind of information on machine-readable records, since computers now generate textual material or textually related material as well as data. The implications of maintaining textual material on computers, in addition to data files, are just now being understood.

Significantly, the habits developed by office personnel rely almost entirely on paper documentation. Records management has meant paper management. (This has remained true even though photographs, maps, films, phonograph records, and video cassettes are defined and treated as records.) The detailed manuals on filing procedures, correspondence control, and records scheduling are primarily concerned with paper files. Although stories abound of old files being summarily emptied into trash bags to make room for new ones, the very fact that most offices keep paper files far too long for efficient management has been reassuring to the generators, keepers, and future users of those files.

Mid-level managers, administrators and program personnel, and their secretaries obviously keep files for their own use. Regardless of statutes, rules, and regulations, offices keep the files they need for the present and might need for the future. People who work in offices have grown accustomed to filing procedures, filing cabinets, drawers and in some instances, agency central files.

Traditional filing systems permit the real records managers of any institution, the secretaries and file clerks, to maintain necessary files and throw out the rest. Periodically, depending upon space constraints, it is possible to go through the drawers and cabinets to "weed" the files: keeping active records, storing inactive records, and throwing out the inconsequential or repetitive. Even when files are lost, hopelessly misplaced, or carried away by top officials to private collections, the bureaucratic system of organization often assures the preservation of information from another file or another memory.

Computer technology promises to change completely these office procedures in the coming decades. Electronic mail, for example,

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[25] *Government Computer News*, January 1984, 20

allows messages to be exchanged among individuals communicating through terminals. Text messages addressed to a specific person are stored in the machine until the recipient is identified to the machine and asks for mes ges. Electronic mail is especi l useful to departments that communicate with field units. An o icer in the Army's Research Division recently told the reporter for *Government Computer News* that his office sends electronic mail nationwide and to over forty countries. In addition to messages that might normally be transmitted by telephone, the office sends documents, panel reports, and memoranda.[26]

The findings of a recent survey on office automation indicate that twenty two federal agencies already are using some form of electronic document nsmission. Twenty agencies are using electronic filing systems while an equal number of offices are maintaining calendars, tracking projects, and sending short messages electronically. Are the clerical or professional users of these office automation systems protecting the necessary administrative files? Do they understand the necessity for preserving those records necessary for accomplishing the substantive purpose of the organization?[27]

It should be stressed that there is no indication that the "paperless" office is just around the corner. For the next decade or two, government cords will continue to be a mixture of traditional paper, printouts of computer-generated information, and information in digital form. However, as more and more information is erated by computers, paper may one day become the exception rather than the rule. This movement toward computer generation, storage, and retrieval of textual records as well as data will profoundly influence the future use of government records by officials and researchers alike.

Special Characteristics of Electronic Records

Data. In order to examine the issues associated with computer-generated records, it is necessary to distinguish between textual records and data files reflecting scientific, technical or statistical information.

An important category of electronic records encompasses those necessary to administer ongoing programs, such as those of the Social Security Administration or the Internal Revenue Service. It is difficult to imagine the orderly handling of these programs without

[26] *Government Computer News*, November 1984 48–49, September 1983 25, February 1984 26

[27] Office Automation Survey compiled by the Information Management Assistance Division, Office of Information Resources Management, General Services Administration, November 1984 The survey noted that automated office information management technology is in its "early stages "

computers. Whether seeking veterans' records from the federal government or disability records from state governments, many citizens depend upon these vital records for themselves and their minor children.

Presently, most computer-generated public records consist of statistical data. Some of these data are merely administrative, such as personnel, supply, and financial management. Other data are programmatic, such as measurement and survey data, taxation, or regulatory information. Unlike textual records, much of these data could only be obtained, stored, manipulated, and retrieved because they came from a computer. Thus, it is not information that can simply be converted to a different medium. The National Wildlife Federation, for example, filed a second freedom of information lawsuit when records requested from the Interior Department's Office of Surface Mining were sent in the form of computer printouts. The federation lawyer, noting that it was impossible to "work with such volumes of data without having it in computer form," filed a second request for the computer tapes.[28]

One important function of modern government is the accumulation and dissemination of data. Those compiled by the federal government are especially important to individuals and states, as the distribution of federal funds is often keyed to certain economic indicators or census data. But government data are equally important for providing essential information for the nation's business community. The Census Bureau, for example, takes a population and housing census every ten years and an economic census every five years. The demographic data collected benefit companies by providing reliable statistics broken down into small geographic areas, so that the private sector can produce its economic estimates and projections. The Bureau also completes an annual survey of the nation's industries.[29] Traditionally, the federal and state governments have been generous in the dissemination of statistical data through printed materials. Computer tapes are now the repository of governmental statistical information, and the computer has added a new dimension to both the administrative and historical use of statistical data. Unlike data stored in human readable form, data stored on magnetic tape can be further manipulated by users to answer a greater variety of questions over an extended period of time. Thus, computer tapes are not just more convenient; they are essential. Much has been learned about social and economic patterns in American society because of the enhanced use of government data collected for administrative or program purposes. Indeed, the ease of manipulating data has raised concern over the privacy interests of people who provide the data. Fortunately, the computer can also

[28] *The Washington Post*, June 27, 1984

[29] Cheryl Russell, "The Business of Demographics," *Population Bulletin*, 39 (June 1984), 20–23

"behead" data so that it does not reveal information about specific individuals.

Thousands of computer tapes in the federal government contain statistical, scientific, or technical material reflecting programs in the Department of Energy, the National Aeronautics and Space Administration, the Bureau of Labor Statistics, the U.S. Geological Survey, the Defense Department and countless other agencies. Cartography, for example, is now digitalized. Often the data does not form the kind of discrete "record" envisioned by records acts. In addition, the cost of retrieving data dependent upon obsolete hardware or unknown software probably will prove prohibitive for future users. Again, this problem may be solved by future standardization, but for the short term, it is a substantial problem.

A common storage medium for all of these scientific, technical, and statistical records is magnetic tape. The National Bureau of Standards has judged the longevity of modern magnetic tape to be about twenty years under ideal storage conditions. A description of the proper conditions for long-term archival storage of magnetic tapes requires six pages of a handbook recently published by the Bureau. The tape must be of superior quality, environmental conditions must be ideal, and the stored tape must be "exercised" by rewinding on an annual or semi-annual basis. After a few years, tapes also should be sampled and selectively read to make sure the data are still usable. Archivists emphasize that preservation of tape also includes the storage of a "back-up copy." One significant advantage of magnetic tape over disintegrating paper is that the information is easily transferred, intact, to a new tape. Recopying the tape every five or ten years can therefore assure an almost endless lifetime for the data. However, the Bureau estimates that, at the present time, the proper handling of magnetic tape costs approximately $10 per reel per year if the proper procedures are used. Even if the cost of maintaining tapes is less than that of paper, the demands of a consistent program for preservation may require budget and personnel commitments more extensive than those usually achieved by records administrators.[30]

Textual Records. In the case of textual records, the distinction between paper and computer is not the information in the record but the medium on which that information is placed and from which it

[30] U S Department of Commerce, National Bureau of Standards, "Care and Handling of Computer Magnetic Storage Media," by Sidney B Geller, NBS Special Publication 500-101 (Washington, D C Government Printing Office, 1983) Also see Geller, "Archival Data Storage," *Datamation*, 20 (October 1974). The following cost comparison was unofficially developed by personnel in the National Archives in 1983 For an equivalent amount of records, the annual average recurring cost for storage and preservation of paper records equals $720.60, for microfilm, $55 32, for computer tape, $22 86 The latter figure includes a back-up for every reel of magnetic tape, hence the cost is double that estimated by the Bureau of Standards

is retrieved. Computers can compile, correct, store, disseminate, manipulate, and retrieve an enormous amount of information in a very efficient manner. But the very efficiency of the computer necessitates the adoption of new procedures in government offices.

As noted above, many offices currently remain unaffected by electronic records. Although the process continues to be very uneven across governmental agencies, even conservative estimates indicate a widespread turn to personal computers directly used by managers, administrators, lawyers, and professionals in all categories. As a result, program records as well as housekeeping and administrative records will increasingly be moved from paper to computer.[31]

Program records, largely executive records, are those that describe the implementation of government policy. They include information gathered by agencies, such as experimental data, interviews, statistics; information submitted in answer to specific laws and regulations such as environmental impact statements, and the reports or summaries evaluating this material. They also include memoranda of meetings or planning sessions and countless other kinds of documents that reflect the diversity of action and interaction between the government and its citizens. These are the records most often used to report to the legislatures on executive branch activities. They are also used in litigation, and they form the bulk of material in records centers and archives. Because of their importance for accountability and because they often reflect the work of the more stable, middle management civil service, these records traditionally have been well preserved.[32]

Officials involved in technical and scientific programs have already adapted to reading and writing on screens instead of paper. Their experiences point to the fact that current records management procedures must be adjusted before electronic records become the dominant media for maintaining the institutional memory of governments. Five specific problems unique to electronic record-keeping have emerged.

First, although paper can be destroyed easily, it cannot be reused. Disks and diskettes, on the other hand, are manufactured for reuse and priced to encourage reuse.

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[31] Automated records have become so important to legislative offices that the Historian's Office of the United States Senate recently included a chapter on the "Management and Disposition of Automated Records" in its new publication, *Records Management Handbook for United States Senators and their Repositories* (Washington, D.C.: Government Printing Office, 1985)

[32] The importance of records for government litigation was stressed in telephone interviews with lawyers from the Department of Housing and Urban Development, October 1 and October 4, 1984; and lawyers in the Civil Division of the Department of Justice, August 7, 1984. Also, interview with Jack Holl, November 29, 1984

Secretaries find it necessary to print information in order to return or circulate it to the proper personnel But the proliferation of terminals on the desks of program officers, managers, and analysts will often obviate the need for a paper copy, especially if terminals are linked in a "local area network" so that complete electronic communication is possible.

In fact, the ease of destroying information on computers is among the most important distinctions between paper and electronic records. For the first time since the widespread use of the typewriter, officials will have to think about saving or keeping records rather than establishing regulations for their destruction.

Second, even if care is taken to preserve the information, rapid changes in technology could limit or even prevent its use. Information created by computers can often be read only if the proper machine and/or proper computer program is available. Thus, information can be both "hardware" and "software" dependent. The automated index to records of the Watergate Special Prosecution Task Force is dependent on the BIBSYS retrieval system. If, in the future, the documentation for this system is lost, information in the records may no longer be retrievable. One recent example of such a problem concerns thousands of enemy documents captured from the North Vietnamese. Throughout that war, captured enemy documents were translated, analyzed, and then microfilmed. There are now over a hundred rolls of captured enemy documents. Along the side of the microfilm rolls is a machine-readable strip described as "very similar to the things that you have on cans of vegetables." This strip is the elaborate index that provides access to the documents. But the machines that created and "read" the bar codes no longer exist. No funding is available to provide a transliteration of the index so that it can be used, although these documents are regarded as important by those writing the retrospective analysis of that war. A similar situation exists in the use of records relating to Situation Reports and Intelligence Summaries.[33] To some observers, the problem of obsolete computers and computer programs is a temporary one, as the industry faces the necessity for standardization and compatibility. This optimism is not shared by others. Meanwhile, some agencies continue to purchase computer systems that are unable to "talk" to each other, let alone future government officials.[34]

Third, information placed in machines is often subjected to continual change. The drafting of policy statements or the development of agency programs has traditionally produced a useful "paper trail"

[33] Vietnam Historians Workshop, May 9, 1983, U S Marine Corps Historical Center, U.S Navy Historical Center, Washington Navy Yard, Spector, 4 Also see Thomas Brown, "Impact of the Federal Use of Modern Technology on Appraisal," Unpublished Paper, NARS (Winter 1983–84)

[34] Summary, CRG Meeting, April 26, 1984

for future analysts or program officers. In addition to the documentation of final policies, the files could educate incoming public servants as to the context of a policy or the reasons for discarding alternatives. On word processors or computers, policy statements, memoranda, and letters are rewritten, with previous versions automatically erased. At what point does this information constitute a discrete "record?" Unless that can be determined, the process of program development may no longer be illustrated by "the file."

Fourth, a diskette placed in a machine collects the information chronologically as the user fills it. Unlike a file cabinet where the information rests in tabbed folders according to subject or number, information on the disk is likely to be randomly filed. Therefore, subject indexes or file names become crucial to retrieval. Those who enjoy the speed and ease of computer retrieval for current information rarely understand the problems of long-term retrieval. In some offices, file "names" often reflect the personal whim of the file creator and thus could be totally incomprehensible to those who need the information in one or two years, let alone ten or twenty. Subject indexes also are designed for the present. The magnitude of maintaining a viable subject index for a cabinet department is illustrated by the subject thesaurus developed for use with the State Department's Central Foreign Policy File. A printed thesaurus contains about 4,100 frequently used terms while the Master Index currently consists of nearly one million terms and is stored on-line in the computer.[35]

Fifth, even if care is taken to preserve the information on the disks or diskettes, both have a very short "shelf life," and thus present grave preservation problems. The National Bureau of Standards estimates that a floppy disk stored under proper conditions can provide information for 10–15 years. Archivists estimate that information on a floppy disk may last no more than five years.[36]

Preliminary guidelines recently developed by personnel in the General Services Administration and the National Archives suggest that these problems are soluble, but only if current practices are modified. For example, the guidelines suggest the development of software requiring a numerical file code (reflecting the agency's filing system), a subject (index) term or terms, and a date on each document. Since many permanent records are distinguished from disposable ones by file codes, such a system would assure the preservation of valuable records. The guidelines also stress the importance of indexing records for future retrieval and caution managers to assure

[35] David H Herschler and William Z Slany, "The 'Paperless Office' A Case Study of the State Department's Foreign Affairs Information System," *American Archivist*, 45 (Spring 1982) 146.

[36] Letter to the Committee from James H Burrows, Director, Institute for Computer Sciences and Technology, National Bureau of Standards, January 29, 1985

that non-current records will still be retrievable before converting to new systems. Permanent records, they note, cannot be stored on disks or diskettes but must be converted to paper, tape, or microform.[37]

This preliminary guide is designed primarily to alert agency managers to the problems raised by electronic records. So far, neither records managers nor archivists have been involved in designing software systems, and many indexes continue to reflect the personal vagaries of the user rather than the future needs of the office.

As one analyst noted, even the word processor, which has a highly specialized computing ability, "serves the functions of a typewriter, a filing cabinet, a copying machine and a shredder."[38] In the world of freestanding computers, every user will in effect become his or her own file clerk, records manager, archivist, and indexer. Computer programs will have to be designed to include these functions in the future, if officials or citizens are to find the documentation for government activity. Although it may technically be feasible one day to "save everything," it will not be feasible in terms of the human ability to cope with that much information. Someone will still have to separate wheat from chaff. The traditional methods for choosing between what to keep and what to throw away—appraisal and scheduling—will be turned upside down, since the ease of destroying information on reusable media will not allow judgements to be made by archivists months or years later. Systems and programs must be designed so that documents are filed according to predetermined file numbers and provided with the proper word or phrase for retrieval.

To summarize, currently, most computer-generated information is maintained on transitory media. This may be only a temporary problem until a permanent medium, such as optical or video disk, for example, provides a solution. Meanwhile, magnetic tape remains the best medium for data since it allows infinite manipulation for current and future users alike. At least temporarily, some more permanent medium must be used for records of long-term value on disks or diskettes. Records officers at GSA are advising offices to convert to paper until something better comes along. However, there is indication that agencies with skilled scientific or technical personnel are already too oriented toward automation to carry out this "backward" step.[39]

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[37] Draft, GSA Bulletin, FPMR (Archives and Records) and GSA Bulletin FIRMR (Information Resources Management)

[38] Fred W. Weingarten, a senior analyst with the Congressional Office of Technology, quoted in Burnham, "Calculating the Cost of Government By Computer," *New York Times*, April 17, 1983

[39] Interview, David K. Allison, Historian, Navy Laboratories, August 29, 1983, interview, Gerald H. Yamada, General Counsel's Office, Environmental Protection Agency, July 19, 1984

The new technologies offer the potential for finally devising a rational system of keeping and using public records. In the past, the major hindrances to such a policy have been three-fold: the difficulty of implementing archival appraisal, particularly in executive agencies: the expense of storing mountains of paper: and the formidable task of retrieving non-current information. Computers offer the possibility of rapid retrieval, and thus timely access to records which has never before been possible. In fact, information systems throughout the public and private sector do just that for current records. Unfortunately, few information systems now are designed to preserve and retrieve documentation from the recent past, whether three, five or ten years.

Computers have the potential for solving these major problems of records management that have plagued governments for the last fifty years. Space for records stored on tape, optical disk, video disk, or their successors, will be measured in inches, not cubic feet.[40] The capability of computers to organize, index, search, and retrieve information creates the possibilities for archival systems unimagined by officials, archivists, and researchers alike. However, the road to this nirvana must bypass some daunting challenges, most of which are institutional changes necessary to harness the technology. These changes must be both practical and flexible, for technology is as volatile as governing organizations are firm.

Information Resource Management

The unforeseen rapidity with which computers were introduced into government offices, as well as the mountains of information confronting every official, have encouraged legislative and/or regulatory efforts to organize and control the information flow. At the federal level, opportunity for legislation came from complaints about the burden of paperwork imposed by the government on the public. It was argued that failure to coordinate information within the federal government resulted in costly duplication and an undue burden upon the public.

Building on the recommendations of the Commission on Federal Paperwork, Congress passed the Paperwork Reduction Act in 1980 (PL 96-511). The Paperwork Commission urged the federal government to regard information as a valuable asset. It suggested that if agencies were required to manage their information in the same systematic fashion as they managed their other resources, there would be better control of paper work. This approach was dubbed Information Resource Management (IRM).

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[40] Compact disks currently used for music may prove particularly useful for archives. They can store 1,500 times as many megabytes of information as a floppy disk of the same size. Thus, one "juke box" of compact disks could handle the archives of a government department. In addition, compact disks currently are not erasable. *The Economist*, February 2, 1985, 75.

One of the stated purposes of the Paperwork Reduction Act is to control the amount of paper coming from the bureaucracy and the excessive paperwork burden on groups or individuals conducting business with the federal government. In order to achieve greater efficiency in accumulating data, the act provides for the coordination and uniformity of information policies and practices. Similar acts are now being passed by state legislatures.

The Paperwork Reduction Act requires each agency to appoint a high level official in charge of information resource management, and consolidates control over federal government paperwork in one central office within the Office of Management and Budget. Every federal agency (with the exception of the Federal Election Commission) must clear paperwork requests with OMB. The Act also ordains a Federal Information Locator System, so that one agency can know if the information it seeks is available elsewhere in the executive branch.

In addition, the Act placed the following functions within the OMB Office of Information and Regulatory Affairs: general information, paperwork clearance, statistical policy, records management, privacy, automated data processing, and telecommunications. The office is charged with overseeing the collection, processing, storage, transmission, and use of information, and developing information resources management principles and guidelines for the evaluation of information management practices in agencies.

The administrator of this office thus received some records management functions. These include advising and assisting the Administrator of GSA in order to coordinate records management policies with information resource management and related information programs such as telecommunications, automated data processing, statistical collection, etc. The Act mandates a number of periodic reviews to ensure that agencies are in compliance. Both congressional oversight committees and the General Accounting Office have documented the fact that the Paperwork Reduction Act is not being properly implemented. For example, there is still no Federal Information Locator System, and some agencies have simply designated an assistant secretary of administration as the chief information management officer.

Unfortunately, there are ambiguities concerning government records and archives in the Paperwork Reduction Act, and they have influenced its implementation. For example, one definition used to implement the Act includes "planning, budgeting, organizing, directing, training, promoting, controlling and other managerial activities involved with the collection, use and dissemination of information." The definition thus omits "disposition," the process of administering records whereby some are chosen for long-term storage and others are thrown away. But records management is in-

cluded within the parameters of the information resource management officer in other sections of the Act. In addition, a recent report by the House Committee on Government Operations pointed to the consolidation of automated data telecommunications services and records management functions into one office at GSA as a model for agencies establishing information resources management offices. A General Accounting Office report on implementing the Paperwork Reduction Act was even more specific. "The Federal Government has been plagued for many years with serious deficiencies in records management," it states. "Oversight of records management has been ineffective and resources and management attention inadequate." A key objective of the Act "was to correct these deficiencies."[41]

The Paperwork Reduction Act is indicative of the fact that governments currently are developing two sets of rules concerning the documentation of their activities: one for paper and another for computer records. For example, the federal government traditionally regulates records management through Federal Property Management Regulations. These rules obviously are concerned with the form of the records, not the information in them. Meanwhile, new legislation concerning information management recognizes the importance of content rather than form. While such duplication might be expected in a time of transition, it is now clear that paper records and computer records will exist side by side for several decades to come. Therefore, information and records management should be rationalized and unified. To accomplish this, records administration will have to include the "information concept" and information management will have to be concerned with the entire "life cycle" of government information.[42]

Importance of Leadership

The leadership necessary for a successful recordkeeping program must come from the "top:" governors or presidents and their closest advisers; cabinet secretaries or agency heads and their deputies; senators or representatives and their chief assistants. Therefore, leadership must come from those most preoccupied with immediate problems and least concerned with documentation.

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[41] General Accounting Office, "Implementing the Paperwork Reduction Act: Some Progress, But Many Problems Remain." Report to the Chairman, Committee on Government Operations, House of Representatives, April 20, 1983. 24 U.S. Congress. House Committee on Government Operations. *Paperwork Reduction Act Amendments of 1983*. (98th Congress, 1st Session, Report No. 98-147. Washington, D.C.: Government Printing Office, 1983), 4.

[42] Ira A. Penn, "Federal Records Management in the 1980's—Is Just Like It Was in the 1780's," *ARMA Quarterly*, July 1984, 10–13. Speech by Frank Carr, Assistant Administrator, General Services Administration, reported in *Government Computer News*, September 1983, 17. Also see James E. O'Neill, "Recent Records Management Legislation in the United States." *Records Management Quarterly*, 13 (January, 1979) 47. Meeting, CRG/Society of American Archivists (SAA), June 4–5, 1984.

Top officials in executive agencies or legislatures rarely, if ever, think about records. Relying upon oral briefings or written memoranda from staff for information, policymakers are isolated from the recordkeeping process by the inherent nature of bureaucratic organization. They have little occasion to trace the useful information back to either the file cabinets or computers of their organizations. Failure to understand the reliance of staff on documentation encourages recently appointed officials and their inexperienced assistants to muddle the difference between files containing personal or political papers and public records. This encourages the removal of all files at the end of a term of office and prevents the development of an institutional memory for continuity and planning.[43]

Though we are certain that existing recordkeeping systems in individual offices involve little or no planning with regard to future use, we cannot tell whether or not this affects adversely the actual operations of government. Here the evidence can only be anecdotal. We have not encountered senior officials who recall being handicapped by difficulty in locating past files. Most feel that their needs were met by oral briefings from old hands. Veteran careerists generally feel that they have the files they need. And, though there are variations from agency to agency, program and administrative records seem adequately to serve the needs of agency clients and employees. While we would like to believe that more systematic recordkeeping would improve policymaking and program management, we can produce no evidence either to prove or to dis : such a hypothesis.

Yet there is agreement among former and present government officials that both management and policy benefits from an understanding of past decisions. Memoranda of meetings, action documents, and drafts illustrating substantial changes in policy all are important sources of information for members of the official's staff as well as those deputies who implement programs and policies. The last decade has seen the general enactment of freedom of information laws and the rebirth of investigative journalism. The result may be a reluctance on the part of top officials to create records. The non-creation of records at the policy level of government organizations was of considerable concern to present and former officials consulted by the Committee. Without records, these officials may know the result of an important change in program or policy without understanding how or why those decisions were made.[44]

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[43] Telephone Interview, James Curry, former historian of the Department of Education, February 14, 1984 Also see David Burnham, "Facts? Let Them Eat Docudrama," *New York Times*, June 4, 1984

[44] CRG/National Academy of Public Administration (NAPA) Meeting, February 16, 1984 and CRG/JFK School of Government Meeting, March 14, 1984 It should be noted that even before the recent changes in government information policy, officials were careful about what they placed in the official record Knowledge of past decisions on sensitive matters is often based on diaries or private letters

On the other hand, these same individuals noted the tendency of mid-level officials and civil servants to keep almost everything "just in case." Thus, the historian, for example, who has the time to find and read the files twenty or thirty years after the fact might indeed find enough documentation to understand a federal decision to adopt certain weapons systems or a state's decision for highway construction. The staff assistant or official seeking timely retrieval of that information would have little chance of finding it, however. Timely retrieval is the key to the use of information in records. The current system of records administration fails to provide such retrieval. Unfortunately, the bulging files and piles of paper merely reinforce the reluctance of recently elected or appointed officials to look to the past. New people, inspired by an electoral mandate, perhaps, th[illegible] they have little to learn from those who preceded them.[45]

The result may be that policy makers often "reinvent the wheel." Several years ago, a former member of the Kennedy and Johnson administrations noted that attendees at a conference on wage-price policy from the Truman administration to the Nixon administration were "chagrined that when they were wrestling with these problems, they did not take the trouble to look back and see what the other administrations had thought or done..." Another former administration official noted that as the head of a number of small offices (before becoming a cabinet secretary), he vividly recalled proposing "brilliant programs" to his staff only to find that they had all been tried ten years before.[46]

A more serious example of an information or record gap was the sudden discovery in 1979 of a brigade of Soviet troops in Cuba. In 1963, after the Cuban missile crisis, officials of the Kennedy administration conceded that the Soviets probably would keep as many as 10,000 men in Cuba for an indefinite period of time. Yet in 1979, this information was unavailable to officials who saw indications of such force in photographs of Cuba taken by satellite. The crisis that developed over this "new" discovery seriously affected the ratification of the SALT II treaty and other aspects of U.S./Soviet relations.[47]

To exert effective leadership and achieve executive or legislative goals, however, policymakers must provide themselves with an organization for managing the information that comes in and out of their own and their chief assistants' offices. Executive assistants or secre-

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[45] Meetings noted above.

[46] The former officials were Walt W. Rostow and Robert Weaver. Transcript, Documents and Records of the Executive Office of the President, a Panel Discussion Arranged Under the Auspices of the National Academy of Public Administration, January 14, 1977. National Study Commission on Records and Documents of Federal Officials, Record Group 220, National Archives and Records Service.

[47] Gloria Duffy, "Crisis Mangling and the Cuban Brigade," *International Security*, Summer 1983, 67–87.

taries often provide that role but many departments and agencies in the federal government now function with Executive Secretariats. (No doubt, many state agencies also have an equivalent staff function.) First established after World War II in organizations such as the Atomic Energy Commission and the National Security Council, which required the coordination of several top officials or a group of agencies, the Executive Secretariat proved particularly useful to those agencies that had a large number of bureaus and/or included disparate functions. The State Department instituted the first cabinet-level executive secretariat in 1947. Every cabinet-level department now has an Executive Secretary. However, many departments limit the executive secretaries to correspondence control or tracking current information. Others have a broader mandate and personnel to effectively manage the entire "life-cycle" of the information they coordinate.

The Executive Secretariat of the Department of Energy is an example of the effective use of this structure for organizing the flow of current information in such a way as to assure proper documentation of departmental activities. This Executive Secretariat has been described as "an extension of the departmental secretary . . . providing the extra eyes, ears, arms, and legs to accomplish all of the things that need to be done."[48] As the "focal" point of activity in the Department, the Executive Secretariat does track all correspondence to and from the offices of the top three officials of the department. But the secretariat staff also tracks every piece of correspondence from Congress and the White House, no matter to whom it is addressed; all reports that are due to Congress or the President; and all actions due because of rules published in the Federal Register or as a result of legislation. Thus the secretariat is the only place in the department where "everything comes together."

Reflecting its origins in the Atomic Energy Commission, the Executive Secretariat in Energy is also unusual because it includes an historical office. Although a number of executive agencies and both houses of Congress have historical offices, many of these offices are not placed as advantageously for purposes of documenting the departments' activities. The executive secretary, for example, can notify the historian when a new office is created so that he might make personal contact to assure that records are being properly maintained. In addition, when the Secretary of the Department leaves, the records of the office are immediately sent to the historical office. The files are "weeded" for duplicates, described for retrieval, and placed in the archives maintained by the historical office before final deposit in the National Archives. Compensating for the inevitable gaps in the record, the historians also conduct oral interviews with the three principal officers of the department before their departures.

[48] Summary, CRG/NAPA Meeting, February 16, 1984

The establishment of this kind of Executive Secretariat, serving as a focal point and including an historical or archival component, is clearly one mechanism for ensuring a better control and use of records.[49]

So far, computers have had little direct impact upon most officials at the policy level. In the federal government, the White House communicates with top cabinet officials through an electronic mailbox, and at least one cabinet secretary travels with a portable terminal capable of instant communication with the department. Traveling officials of the National Science Foundation also carry portable terminals. Computers are also used in executive agencies to track correspondence or memoranda, and every office in the United States Congress now uses the computer for an assortment of activities, from constituent correspondence to tracking legislation.[50] Nevertheless, most top officials still read messages on paper and file paper documents. Even information being tracked on a computer usually is written on paper. But computers that can generate, manipulate, store, retrieve, and print out great volumes of information are inevitably affecting the governing process.

CONCLUSIONS

First: Governments have a huge quantity of paper records haphazardly stored at an annual cost probably running over a third of a billion dollars.

The executive branch of the federal government holds about forty million cubic feet of paper records. If the accumulated paper of the federal government were stored in standard four-drawer filing cabinets, the line would stretch for a thousand miles; or, from Washington to New Orleans. Less than two percent of the total number of records is in the National Archives; just under 40 percent are records held for executive agencies in Federal Records Centers; the nearly 60 percent remaining are in agency filing cabinets.[51] Retention of use-

[49] Interview, William Vitale, Executive Secretary, Department of Energy, and Jack Holl, Historian, Department of Energy, December 9, 1983. Summary, CRG/NAPA Meeting, February 16, 1984 The Department's Executive Secretariat receives daily requests for recent documents, averaging 25–30 requests per month The historical office also receives daily requests for historical documents, averaging 40–50 per month Almost all of these requests are for documents over 25 years old Letter to the Committee from William V. Vitale, February 1, 1985

[50] See David Burnham, "White House Link Computer in Ohio," *New York Times*, July 13, 1983, and "Computer is Leaving a Wide Imprint on Congress," *New York Times*, April 14, 1984 Also remarks delivered by Stan W Prochaska at a seminar on electronic communications technology sponsored by NARS and GSA, May 5, 1983, in Washington, D.C.

[51] "Government Recordkeeping Requirements Actions and Act of 1981" (HR 316), Hearings, U.S. House of Representatives, Committee on Government Operations, 97th Congress, 1st Session, December 8–9, 1981 (Washington, D C Government Printing Office), 135, 143.

less records and the failure to establish cost-effective systems for the storage and retrieval of useful documents clearly leads to needless annual expenditures and waste.

Yet there is widespread and, we believe, justifiable apprehension that governments are failing to create or retain some of the records required for current governmental business and future understanding of the nation's history. Though we cannot judge whether actual operations would be improved thereby, we presume that, if records of day-to-day policymaking and agency management are so kept as to satisfy the needs of agency managers and accountability requirements of legislatures, they will include the records future generations will want in order to learn about their past. By the same token, if day-to-day records are badly kept, they will not include the documents that generations will need and want.

Second: Governments are increasingly creating records electronically and retaining tapes or disks rather than paper.

New technology reduces requirements and costs for storage space, but under current programs, promises both to complicate record retrieval and possibly to increase costs for record retention. As noted, the federal government now has at least 19,000 large and medium-sized computers. An unknown number of microcomputers have been installed in individual offices. (One estimate is 200,000, with five times as many foreseen in the near future.) Currently, many paper records are "hard" copies of originals on tape or disk. In many instances, the only record is a "soft copy" on tape or disk, and such instances become steadily more numerous as clerical personnel, agency staffs, and even senior officials become more accustomed to the use of monitors.

Third: The danger of losing historically valuable records is greatly increased by the changeover in technology.

While systems now in effect may result in retention of large quantities of useless paper, they originate in plans that provide for preserving records. In general, tape and disk systems seem designed for comparatively limited or short-term use, although there are notable exceptions, particularly for statistical and scientific series. The possibility seems to us very strong that important records will be erased or simply lost *before anyone has a chance to exercise judgement about their possible reference or historical value.*

We are uncertain how rapid or complete the technological transition will be. At present, the majority of government records exist in paper copy regardless of how they were originally generated. This could continue to be true. The "paperless office" may never become a reality. On the other hand, a near-complete transition could occur in the next several years. The key variables are the availability of

technology and the adaptability of office managers, secretaries, and clerks, and we feel unable to predict either.

Currently, there is no real basis for calculating the costs/benefits of new technologies. While paper records take up a great deal of space, once a finding aid has been developed, the process of retrieval requires no particular equipment or expertise. A small shelf of tapes or disks can house the contents of a bank of file cabinets, but a search of that shelf to retrieve a single document requires a computer, appropriate software, and someone skilled in their use. Given the rapidity of technological change, the needed equipment and skills may be obsolete for any purpose other than retrieval. Hence, costs could be much higher. As a result, the government and the public could lose the use of electronic records even though they originally had been preserved because of reference or historical value.

Fourth: Responsibility for decisions regarding records is fragmented and ill-defined.

At the federal level, responsibility and authority currently are divided between four groups: independent agencies, the Office of Management and Budget, the General Services Administration, and the National Archives and Records Administration.

The National Archives and Records Administration has statutory responsibility for documents of enduring or historic value. Records management responsibility is shared with the General Services Administration.

The National Archives staff approves "records schedules." Communicated to records managers, these schedules stipulate which types of routine records may be destroyed and when. After thirty years, the Archivist may ask for the transfer of the remaining records to the National Archives and the Archives staff further winnows out the small percentage to be kept more or less forever. The General Services Administration, however, is responsible for establishing guidelines and educating personnel on the management of current records. Legislation passed in 1984 severing the National Archives from the General Services Administration and establishing it as an independent agency left ambiguous the division of responsibility between the two agencies.

In the Paperwork Reduction Act of 1980, Congress instructed the Director of the Office of Management and Budget to oversee and coordinate "information resources management" in federal agencies. As a result, the Office of Management and Budget now has certain statutory responsibilities for records. The statute created an Office of Information and Regulatory Affairs headed by an Administrator reporting to the Deputy Director concerned with management. Since the Office was also charged with oversight of deregu-

lation, it understandably concentrated on fulfilling its mandate to reduce immediate paperwork burdens imposed by the government on the public. It gave only secondary attention to information resources management, delegating this function to the office of the Assistant Administrator for Information Resources Management in the General Services Administration. This office helps agencies design and acquire information processing systems, but reasonably and understandably leaves to the individual agencies the criteria which the systems are to satisfy.

In many agencies, the senior official designated as information resources manager has been someone already responsible for management or financial administration. In any case, the assignment has been interpreted as embracing chiefly the establishment of requirements for new data processing equipment and systems while records managers, administratively well below the ken of information resource managers, retain their traditional responsibility in accordance with established rules.

It is clear that, in practice, this dispersal of responsibility for records leads to a situation where no individual or agency can or will assume the ultimate responsibility.

Fifth: Solutions workable in federal executive agencies can and should be transferred to state and local governments.

The federal government can set an example in every area of recordkeeping. Its recordkeeping responsibilities are much broader than those of any state, comprising, as they do, records relating to national security, the economic health of the whole country, and research and development at nearly all frontiers of knowledge. Nevertheless, there are no record-keeping issues peculiar to state or local governments.

Federal executive agencies and legislative committees should offer models in the maintenance of coherent policy records and in the creation and maintenance of program records Systems should ensure the most efficient, expeditious, and discriminating provision of service to the public. In addition, the federal government should set an example in providing the public with accessible and usable historical records, including those embodying statistical data and documentation concerning the nation's political, economic, technical, and social evolution

RECOMMENDATIONS

First: Responsibility for managing records must rest within the individual government agencies. The process for such management should clarify lines of authority, standards, and procedures, and provide realistic oversight, with the Archivist of the United States in

a central role. Management of records within agencies should include the following:

a. Duties and responsibilities of senior managers must explicitly encompass the management of records. Briefing papers prepared for newly elected or appointed officials, federal executive seminars, conferences, and publications concerned with public administration can assist top officials by alerting them to the importance of effective records management and briefly informing them of the correct procedures.

b. All budgets from policy, administrative, and program offices (including those for non-government contractors) must include provisions for the records they create. Inclusion in the budget process can help assure managerial attention to the government records.

c. Information management must explicitly include systems for the control and disposition of records. Regulations implementing the Paperwork Reduction Act that specifically apply to information management should clearly include all records. Decisions to create documents or data files must encompass decisions as to where, how, and how long documents or files are to be stored, so that we can assure continued accessibility for documents or data of enduring value while avoiding the costs of excessive retention. Decisions to develop, acquire, or install new information systems should address the question of whether existing files or bodies of data have to be recopied or recoded in order to remain usable, and the cost of doing so.

d. Properly implemented, the existing statutes permit and encourage such a change. The Paperwork Reduction Act makes the head of each agency responsible for planning and managing information resources. It mandates the establishment in each agency of a top-level office concerned solely with information policy. Agency heads should therefore assume responsibility for managing all records, regardless of how the records are originally created. In practice, an agency head would have to delegate responsibility to an executive secretariat, if it exists, and to senior managers, with the top-level information policy office providing coordination and oversight. The requirements of the Paperwork Reduction Act for Five-Year Plans and Three-Year Audits offer the means for presidential and congressional oversight.

e. Because of the importance of the initial decisions concerning the development of information systems or disposition of records, each senior level information resources manager should have on his or her staff qualified historians or archivists to assist in devising and monitoring systems for the control of

records, their unnecessary proliferation, and the preservation of those records of potential historical value.

Second: The next Archivist of the United States, appointed by the President and confirmed by the Senate, must take full advantage of his/her status to establish a new and important role for the National Archives. At best, the concern for records administration is peripheral to administrators in the Office of Management and Budget and the General Services Administration. Therefore, as the head of the only government agency whose primary mission is records and archives administration, the Archivist of the United States must provide visible and dynamic leadership. To provide this leadership, the Archivist should do the following:

a. Reexamine the basic premises behind current guidelines and standards for the organization and retention of records and archives. Electronic record-keeping certainly permits and may even encourage a diversified archival system. Standards and guidelines enforced through oversight of agency tape libraries, for example, may have to replace physical possession of data or documents on magnetic tape or optical disk.

b. Establish a reference division within the National Archives to provide government agencies with the information in the records as well as the records themselves. Currently, agencies that have extensive research needs from non-current records usually seek help from outside contractors. A reference service staffed by individuals familiar with archival research should be able to provide information more economically than either an outside contractor or the agency itself.

   Its existing expertise also gives the Archives capacity for contributing to the data base of the Federal Information Locator System mandated by the Paperwork Reduction Act. Additional knowledge obtained as a result of assisting information resource managers throughout the executive branch will enable Archives staff to make a greater contribution to the government's ability to retrieve information as well as individual documents. To the extent that information thus developed can be computerized, the Archives, over time, can build up an electronic data base, progressively enhancing its reference capabilities.

c. Provide leadership to state and local governments on matters concerning public records comparable to that which the Librarian of Congress provides with regard to printed materials, setting standards of excellence and efficiency, and serving as a center of training. Consideration should be given to the establishment of a research institute to foster both the application of current technologies and the education of archivists and other

information specialists who must work within rapidly changing environments.

d. Seek an impact on the public comparable to that of the Library of Congress and the Smithsonian Institution. To strengthen the position of the newly independent agency, the next Archivist should establish an illustrious national advisory committee. In addition, using the presidential libraries and regional centers, the Archivist should fulfill the larger cultural function of educating the public with regard to the national documentary heritage. The establishment of representative advisory groups for each of the regional archives might provide a first step in this direction.

Third: Recognizing the history of neglect, the seriousness of the current situation and the volatile future, *the Committee recommends that the President of the United States issue an Executive Order on Government Records.* The objective of this Executive Order is to integrate responsibilities now spread between three separate staff agencies and to assign to each operating agency the responsibility for the administration of an effective and efficient records program.

A model Executive Order is attached to this report (Attachment I). To briefly summarize, the Executive Order provides for the following:

...The establishment of a Records Management Policy Council consisting of top officials from the Office of Management and Budget and the General Services Administration and chaired by the Archivist of the United States. Each member will compile for the Council a compendium of all "regulations, instructions, standards, procedures, guidelines and schedules" pertaining to records that had been issued by his or her agency. The council will then "develop and adopt a detailed plan" so that each agency can coordinate and more effectively carry out its responsibilities. Documents to implement the plan must be approved by the Council which would meet regularly, to see that it is expeditiously implemented and evaluate the "steps taken pursuant to the plan." (Section 4, a, b)

...The appointment by each agency head of "one or more persons who are qualified by experience, training or education as archivists, historians or records managers to be assistant information resources managers." These assistants will develop and implement a program which will assure compliance with current statutes, and with the regulations and standards issued to implement these statutes. (Section 5)

This Executive Order will provide coordination between agencies now responsible for government records and establish an ongoing process to meet the challenges of the future.

We believe that the United States can have information and records systems which at one and the same time serve well the interests of government itself and the interests of the public, both present and future. The evidence and testimony we have collected convinces us that there is ample good will for such systems within both the federal government and in states and localities. The key problem, we have concluded, is one of design as well as resources, and more one of will than of anything else. When original responsibility for determining both information needs and information retention needs is given to those who will use that information; when, in turn, they are counselled by qualified archivists or historians; and when agency-wide and government-wide policies result from a coordinating Council; the federal government can set and maintain an example that can be copied by governments at all other levels.

If officials forty or even thirty years ago had looked up beyond their in-baskets and visualized that thousand miles of filing cabinets, there might be no need for our report and its recommendations. If enough Americans see now in their minds' eyes comparable stretches of tape reels and diskette cartons receding into the horizon, a report on government records issued in 2005 may perhaps describe efficient and economical systems serving equally well the needs of government and the long term needs of the nation.

Attachment I

Draft

EXECUTIVE ORDER

By the authority vested in me as President by the Constitution and laws of the United States of America, including Section 301 of Title 3 of the United States Code (Presidential delegation of functions) and Chapter 21 (Archival Administration), Chapter 29 (Records Management by Administrator of General Services and by Archivist), Chapter 31 (Records Management by Federal Agencies), Chapter 33 (Disposal of Records) and Chapter 35 (Coordination of Federal Information Policy) of Title 44, United States Code (44 U.S.C.) as last amended by the National Archives and Records Administration Act of 1984, P.L. 98-497 effective April 1, 1985 (the "1984 Act"), in order to integrate and improve functions of Federal Government officials in carrying out their respective statutory responsibilities for records management, it is ordered as follows:

Section 1. Coverage.

(a) As used in this Order, the term "records management" means the planning, controlling, directing, organizing, training, promoting, and other managerial activities involved with respect to records

creation, records maintenance and use, and records disposition in order to achieve adequate and proper documentation of the policies and transactions of the Federal government and effective and economical management of agency operations.

(b) As used in this Order, the term "agency" means any executive department, military department, Government corporation or other establishment in the executive branch of the Government (including the Executive Office of the President) or any independent regulatory agency, but does not include the General Accounting Office, Federal Election Commission or Government-owned contractor operated facilities.

(c) This Order covers the statutory responsibilities for records management identified on the attached Annex of the following Federal Government officials:

(1) Archivist of the United States ("Archivist") as head of the National Archives and Records Administration ("NARA");

(2) Administrator of General Services ("Administrator") and the Assistant Administrator for Information Management who is in the General Services Administration ("GSA");

(3) Director of Office of Management and Budget ("Director") and the Administrator of Office of Information and Regulatory Affairs which is in the Office of Management and Budget ("OMB");

(4) Head of each Federal agency and the official or officials of his agency designated to carry out the agency's responsibilities under Chapters 31 and 35 of 44 U.S.C. ("Information Resources Managers").

Section 2. Policy.

This Order follows the objectives of the Congress in enacting its statutes that deal with records management, including:

(a) Accurate and complete documentation of the policies and transactions of the Federal Government.

(b) Control of the quantity and quality of records produced by the Federal Government.

(c) Establishment and maintenance of mechanisms of control with respect to records creation in order to prevent the creation of unnecessary records and with respect to the effective and economical operations of an agency.

(d) Simplification of the activities, systems, and processes of records creation and of records maintenance and use.

(e) Judicious preservation and disposal of records.

(f) Direction of continuing attention on records from their initial creation to their final disposition, with particular emhasis on the prevention of unnecessary Federal paperwork.

(g) Appraisal, deposit and maintenance in the National Archives of records having sufficient historical or other value to warrant their continued preservation by the Federal Government.

The purpose of this Order is to improve implementation of such objectives by integrating responsibilities which are spread among

three separate staff agencies to set and administer overall records management policies and by assigning to each operating agency necessary responsibility for the quality of its own records and for the effectiveness and efficiency of its records management practices.

Section 3. Establishment of Records Management Policy Council.

The Archivist, the Administrator of the Office of Information and Regulatory Affairs in OMB, and the Assistant Administrator for Information Management in GSA shall constitute a Records Management Policy Council. The Archivist shall serve as Chairman of the Council and with the concurrence of the other members shall name an employee of NARA to be Executive Secretary of the Council. The Council shall adopt its own rules of procedure.

Section 4. Functions of Records Management Policy Council.

(a) Each Council member shall present to the Council complete copies of regulations, instructions, standards, procedures, guidelines and schedules of general application to Federal agencies which have been issued pursuant to responsibilities covered by this Order and which are still in effect, along with a full report of similar documents issued or approved pursuant to the same responsibilities that have application to particular Federal agencies. The Council shall review this material with a view to planning revisions and additions to these documents which are necessary or desirable. In this connection, the appropriate Council member through his own staff agency shall elicit such reports from Federal operating agencies and make such examinations as will aid the Council in its planning.

(b) The Council shall develop and adopt a detailed plan by which Council members may more completely and effectively carry out their respective responsibilities covered by this Order. This plan shall remain subject to changes as experience with implementation may dictate. As part of the plan, assignments to each Council member, consistent with the statutory responsibilities of his agency, shall be made and completion dates set. Assignments of any member shall be performed in consultation with the other members, and before any document to implement the plan is issued or acted upon, it shall be approved by the Council. The Council shall meet regularly to see that the plan, once adopted, is expeditiously implemented and then to evaluate the effects of the various steps taken pursuant to the plan.

(c) The Council shall perform such other functions related to the responsibilities covered by this Order as the members may decide are necessary or desirable to fulfill the purpose of this Order.

Section 5. Implementation of Each Agency's Responsibilities.

The head of each agency shall be responsible for seeing that his agency carries out the policy of this Order. In addition to appointing a senior official under 44 U.S.C. § 3506(b) of Chapter 35, to be the

information resources manager for his agency, the head of each agency shall appoint one or more persons who are qualified by experience, training or education as archivists, historians, or records managers to be assistant information resources managers. Such assistants shall be assigned to develop and implement under supervision of the head of the agency and the information resources manager and through cooperation with and assistance from NARA, GSA and OMB a program which will assure that the agency fully meets the requirements of Chapters 31, 33 and 35 and of the regulations and standards issued thereunder. The numbers of such appointees in each agency shall be sufficient to perform this assignment. An agency without a reasonable need for a full-time or permanent assistant information resources manager may instead obtain the part time or temporary services as needed of an employee of NARA on a reimbursable basis.

Section 6. Public Involvement

The Records Management Policy Council and each agency in carrying out the policy of this Order shall regularly consult with and seek the advice of persons outside of the Government who are representative of principal users of Government records for reference and research purposes.

Section 7. Reports.

Prior to the end of each calendar year, the Council shall prepare and submit to the President a full report of its actions and activities over the twelve months ended on September 30th of such year, along with its evaluation of implementation by Federal agencies of their records management responsibilities.

The White House

_____, 198___.

ANNEX TO EXECUTIVE ORDER
Records Management Responsibilities Covered by Order

1. Overall policy responsibilities

a) Establishment by the Archivist or the Administrator of standards, procedures, systems or techniques to assure efficient and effective records management within the purposes of Chapters 21, 29, 31 and 33 of 44 U.S.C. (§ 2902 as amended by § 107(b)(14) of the 1984 Act);

b) Development and implementation by the Director of Federal information policies, principles, standards, and guidelines as provided in Chapter 35 of 44 U.S.C. (§ 3504(a));

c) Establishment by the Archivist of standards for selective retention of records under Chapter 29 of 44 U.S.C. (§ 2905 as amended by § 107(b)(15)(B) of the 1984 Act);

d) Issuance by the Archivist of regulations for records disposal lists and schedules and review of lists and schedules from each agency under Chapter 33 of 44 U.S.C. (§§ 3302, 3303, and 3303a as amended by § 107(b)(23), (24) and (25) of the 1984 Act);

e) Establishment by the Director of standards and requirements for agency audits of all major information systems and establishment by him of a schedule and management control system to ensure that practices and programs of information handling disciplines, including records management, are appropriately integrated with mandated information policies under Chapter 35 of 44 U.S.C. (§ 3505(2)(A) and (3)(A)); and

f) Promulgation by the Director of rules, regulations, or procedures necessary to exercise his records management authority under Chapter 35 of 44 U.S.C. (§ 3516).

2. Coordination responsibilities

a) Provision of advice and assistance by the Director to the Archivist and the Administrator to promote coordination in the administration of Chapters 29, 31 and 33 with the information policies, principles, standards and guidelines established under Chapter 35 of 44 U.S.C. (§ 3504(e)(1) as amended by § 107(b)(26) of the 1984 Act);

b) Coordination by the Director of records management policies and programs with related information programs such as information collection, statistics, automatic data processing and telecommunications, and similar activities under Chapter 35 of 44 U.S.C. (§ 3504(e)(3)); and

c) Provision of advice and assistance by the Archivist and Administrator to the Director in connection with his periodic reviews of each agency's information management activities under Chapter 35 of 44 U.S.C. (§ 3513 as amended by § 107(b)(27) of the 1984 Act).

3. Assistance to Federal agencies

Provision of guidance and assistance to Federal agencies by (i) the Archivist to ensure adequate and proper documentation of the poli-

cies and transactions of the Federal government and proper records disposition and (ii) the Administrator to ensure economical and effective records management by such agencies, and the related responsibilities of the Archivist and the Administrator under Chapter 29 of 44 U.S.C. (§ 2904 as amended by § 107(b)(16) of the 1984 Act).

4. Reports, inspections, reviews, and enforcement

a) Obtainment by the Archivist and the Administrator of reports from any Federal agency on its activities under Chapters 21, 29, 31, and 33 of 44 U.S.C. and correction of violations, as provided by Chapter 21 of 44 U.S.C. (§ 2115 as redesignated by § 102(a) and amended by § 107(a) of the 1984 Act);

b) Inspection by the Archivist or the Administrator of records of Federal agencies covering their records management practices and programs as provided by Chapter 29 of 44 U.S.C. (§ 2906 as amended by § 107(b)(17) of the 1984 Act);

c) Review by the Director of compliance by agencies with the requirements of Chapters 29, 31 and 33 of 44 U.S.C. and with regulations promulgated by the Archivist or the Administrator, as provided by Chapter 35, 44 U.S.C. (§ 3504(e)(2) as amended by § 107(b) of the 1984 Act); and

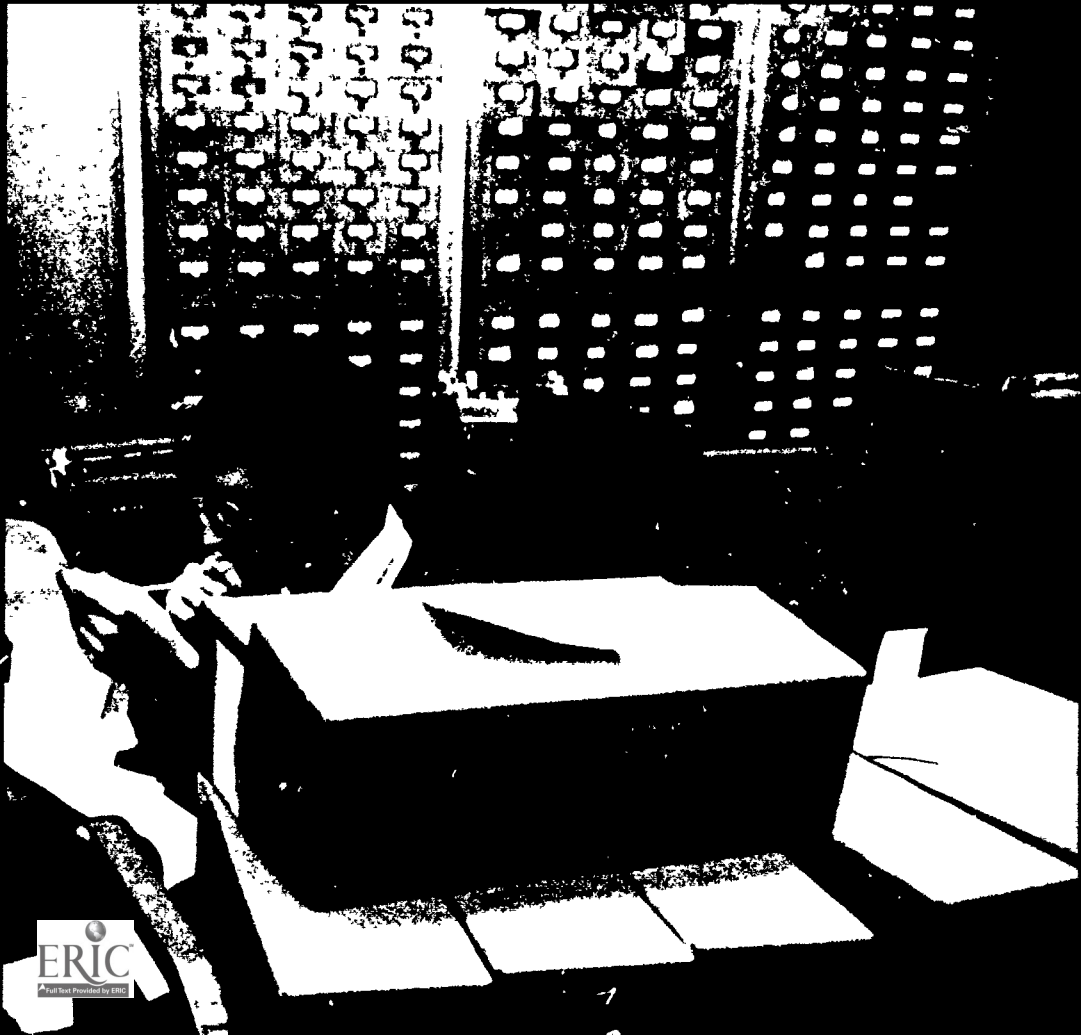
d) Review, at least every three years, by the Director of the information management activities of each agency to ascertain their adequacy and efficiency, as required by Chapter 35 of 44 U.S.C. (§ 3513 as amended by § 107(b)(27) of the 1984 Act).

5. Federal agency responsibilities

a) Federal agency duties to make and preserve adequate records, to establish and maintain an effective and efficient records management program and to implement the other requirements of Chapter 31 of 44 U.S.C. (§§ 3101 *et seq.*);

b) Submission to the Archivist of records disposal lists and schedules under Chapter 33 of 44 U.S.C. (§ 3303 as amended by § 107(b)(24); and

c) Duties to carry out information management in an efficient, effective and economical manner, to comply with the information policies, principles, standards and guidelines prescribed by the Director and to meet the other requirements of Chapter 35 of 44 U.S.C. (§ 3506).



Attachment II
List of Meeting Participants and Additional Interviewees

In the course of its eighteen-month study, the Committee on the Records of Government held a series of eight informational meetings with a number of public officials and private citizens familiar with government procedures and/or government records. The meetings and their dates were:

Meeting with members of the American Historical Association,
December 29, 1983

Joint meeting with the National Academy of Public Administration,
February 16, 1984

Meeting with representatives of the Public Archives of Canada
March 1, 1984

Meeting at the John F. Kennedy School of Government, Harvard University,
March 13, 1984

Meeting with members of the Organization of American Historians,
April 5, 1984

Meeting on Electronic Record-keeping,
April 26, 1984

Joint Meeting with the National Association of State Archives and Records Administrators,
May 4, 1984

Joint Meeting with the Society of American Archivists,
June 4–5, 1984

Additional interviews were conducted by the Chairman of the Committee and the Project Director.

A researcher in the Central Research Room, National Archives building

List of Meeting Participants and Additional Interviewees

Meeting Participants

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Gerald H. Yamada
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Appendices

Appendix I

Government Records Programs: An Overview

Victoria Irons Walch

Contents—Development of Government Records Programs in the United States—Implementation of Government Records Programs—Impact of Automated Information Processing Techniques—Government Records and Government Information Policy.

This paper was prepared to provide a brief history and basic information about government records, in non-technical terms. It was distributed as the Committee began its series of information meetings in January 1984.

Bound volumes of old records, badly in need of conservation attention, can be found in almost every records repository in the country.

Government Records Programs: An Overview

I. Development of Government Records Programs in the United States

Introduction

Concern for the care of government records in the United States is as old as the governments themselves. Provisions for safeguarding certain official documents often were written into state constitutions or incorporated in the earliest acts of the legislatures. The earliest federal "housekeeping" statute in 1789 authorized agencies to set up filing systems and keep records. The very first action of the California legislature when it convened in 1850 provided for the creation of a public archives. Richard Bartlett, an early New Hampshire secretary of state who conducted one of the earliest surveys of archival material in the United States, stated the responsibility clearly: "To provide for the safe and perfect keeping of the Public Archives is so obviously one of the first and most imperative duties of a legislature, that no argument could make it plainer to a reflecting mind."[1]

While the American people and their representatives have always expressed a formal interest in government records, the level of care given to them has been radically uneven. Until the early twentieth century, only the most important legal records, legislative journals, enrolled laws, and titles to land were specifically protected or assigned to an official for protection. Beyond these, each officeholder and his subordinates were free to make their own rules and devise their own systems for filing and storage. Records handled with respect have lasted a remarkably long time. There is the occasional county official who can point with pride to the continuous series of beautiful leather-bound minute books dating back 150 years neatly shelved behind his desk.

Other records met another kind of fate as courthouse fires, spring floods, and nibbling rodents took their toll. Autograph and stamp collectors also have contributed to the dispersion or loss of public records. Officeholders came and went, newly elected officials of en-

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[1] Adrienne C. Thomas, "Federal Law and Access to Sources: The Freedom of Information Act, Security Classification, and the Privacy Act," *The Records of Federal Officials*, ed. Anna Kasten Nelson (New York: Garland Publishing, Inc., 1978), 316. California *ARP*, p. 1. The reports issued by the various states at the conclusion of the National Historical Publications and Records Commission (NHPRC)-sponsored Assessment and Reporting Projects (ARP) are cited in footnotes as *ARP*. Many of them were still in the draft stage when used, with the potential for further changes in title page and pagination. The *ARPs* are available for use at the NHPRC offices or from the Historical Records Coordinator in the respective states. H. G. Jones, *Local Government Records: An Introduction to Their Management, Preservation, and Use* (Nashville, Tennessee: American Association for State and Local History, 1980), 3.

did not realize the value of the volumes they inherited; the "old stuff" was crammed wherever there was space—in the attic, under the porch steps, or in ventilating shafts. In the latter half of the nineteenth century, record-keepers began using loose paper files instead of bound volumes. With the introduction of the typewriter and, later, duplicating equipment, the volume of paper began to increase dramatically. Although officials recognized the need to retain certain records for their legal or historical value, they were overwhelmed by the crush of new paper on top of old.

Meanwhile, in the late nineteenth century, the writing of history underwent a profound change. History became an academic discipline rather than a branch of literature. American historians, returning from European universities where scholars used manuscripts and archives, found that their own country lacked a commitment to the preservation of primary source materials. The American Historical Association established the Public Archives Commission in 1899 out of concern over the condition of the public records. The charge to the commission was to investigate the "extent, condition, character, and availability of the numerous classes of public records in the states and important local communities and to do so in the hope that it would help arouse interest in the better care of archives." By 1910, the Commission had completed 46 survey reports covering 32 states, two cities, and the Philippines.[2]

The unmanageable volume of material and the interest of the historical community converged around the turn of the century in a drive to establish central repositories for the care of government archives. While the federal government began considering the establishment of a "hall of records" in the 1870s, the first archival agencies were established at the state level.[3] In 1901, the Alabama legislature approved a measure creating the first agency specifically designed to administer state archives. The mandate of the new Alabama Department of Archives and History was broad, including not only the care and custody of the state's official archives but also other adjunct historical functions such as the publication of official records, the collection of all forms of historical materials (public and private), and "the encouragement of historical work and research."[4]

Other states soon followed Alabama's example. By 1909, eight states had created public records or historical commissions and appointed archivists; six had designated the state library as the state's archival agency; four had given that designation to the state historical society, and three had appointed state historians who were instructed to "collect, edit, and prepare archival material rather than to have custody of the records themselves."[5]

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[2] Ernst Posner, *American State Archives* (Chicago: University of Chicago Press, 1964) 20. Gerald N. Grob, "Archivists and Historians: Problems of Appraisal," a paper delivered at the meeting of the Society of American Archivists, Boston, October 20, 1982.

[3] H. G. Jones, *Records of a Nation: Their Management, Preservation, and Use* (New York: Atheneum, 1969), 5–6.

[4] Posner, *American State Archives*, 19–20.

[5] Margaret Cross Norton, *Norton on Archives: The Writings of Margaret Cross Norton*, ed. Thornton W. Mitchell (Carbondale: Southern Illinois University Press, 1975) 3–4.

The fear that public records were being deliberately destroyed played only one part in this effort. There was equal concern about the adequacy of the care given to public records and their accessibility to government employees and the public. Historians obviously had a stake in both, fearing the loss of original source material through accident or disaster on the one hand and the inability to locate needed documentation because of unsystematic filing or bureaucratic indifference on the other.

By keeping too much, officials made it difficult to distinguish the useful information from the useless. By storing records poorly, they subjected them to the ruinous aspects of water, mold, heat, light, and vermin. By allowing them to stay in the hands of people charged with administering ongoing government programs, public accessibility was spotty at best. Thus the creation of the government agencies whose sole purpose was to preserve and make available government records was a significant step.

After three decades of unsuccessful legislative attempts, Congress authorized the preparation of plans for a federal archives building in 1913. Delayed by World War I, serious planning did not begin until the 1920s. In 1926, the proposal for an archives building was incorporated into the plans for the development of a "federal triangle" housing government agencies. As building construction proceeded in the early 1930s, Congress prepared the National Archives Act of 1934. An independent archival agency was established that reported directly to the President of the United States and whose authority extended to all three branches of government. Under the 1934 Act, the Archivist of the United States could inspect all records in any agency, requisition the transfer of records to the Archives, establish regulations for the arrangement, custody, use, and withdrawal of deposited material, and recommend the disposal of records of no enduring value.

In spite of a promising beginning, subsequent progress in the development of state archival programs was agonizingly slow. Even where authorizing legislation existed, some programs failed to develop or, after a strong start, withered for lack of funding or other support. In 1930, Margaret Norton noted that every state had made some provision for its records, but Ernst Posner's survey of state archives in 1963 found that, in fact, twelve states had no program for handling their records at all. Advocacy continued, however, and by the mid-1970s, every state in the Union finally had designated a single agency to serve as a repository for the state's archives.

The Development of Records Management

The first responsibilities of these new federal and state archives were surveying records held by government agencies and transferring historically significant material to the archives. The archivists, sifting through great piles of records, soon recognized that their involvement in the process of records creation could lead to better control over both the quantity and the quality of those records. As early as 1941, the Archivist of the United States stated that "the

National Archives must inevitably be concerned with the creation, arrangement, and administration of Government records, and. . . in order to perform its functions satisfactorily it must have a knowledge of the records that can come only through a continuous survey of them."[6]

The explosion of records that occurred during World War II provided the impetus for the growth of records management. The total volume of federal government records increased from 10 million cubic feet in 1939 to 18 million cubic feet by 1946. Agencies that had been reluctant to relinquish custody of their older material before the war suddenly turned to the National Archives for relief as new records overflowed existing storage space. As agencies transferred or disposed of older material, they also began active programs to control their newer records more efficiently.

By the late 1940s, a body of principles and practices had evolved under the rubric of records management. Preservation of legally significant or historically valuable records in an archives was now seen as only one part of a much larger process that began as soon as records were created. Advocates of records management sought to control and improve the entire "life cycle" of records by handling mail more efficiently, streamlining the production of correspondence, establishing efficient filing systems, eliminating unnecessary reports and issuances, simplifying or eliminating forms, reducing the volume of files through use of micrographics, providing cheap storage for semi-current records in centralized records centers, and ensuring that records were kept no longer than necessary. In the words of Emmett J. Leahy, one of the pioneers in records management: "The purpose of records management [is] fewer and better records."[7]

The first step toward institutionalizing records management as a government-wide responsibility came when President Truman issued Executive Order 9784 on September 25, 1946. It directed each federal agency to develop an active records management program and authorized the Bureau of the Budget to conduct inspections and issue regulations regarding the orderly disposal of unnecessary records with the advice and assistance of the National Archives. Four years later, following the recommendation of the Hoover Commission, Congress passed the Federal Records Act of 1950.

Heads of all federal agencies were charged with establishing and maintaining "an active, continuing program for the economical and efficient management" of their agencies' records. Each agency also was required to ensure that adequate documentation of its "organization, functions, policies, decisions, procedures, and essential transactions" was created and preserved in order "to protect the legal

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[6] *Seventh Annual Report of the Archivist of the United States*, 1940–41, 1, as quoted in Jones, *Records of a Nation*, 28. In 1939, surveys located nearly 10 million cubic feet of federal records nationwide. Some 6,570 separate storage sites existed in the Washington, DC area alone, holding 2.7 million cubic feet of paper records, 17.7 million running feet of motion picture film, 2.3 million photographic negatives, and nearly 5,500 sound recordings. By 1941, the National Archives had accessioned 330,000 cubic feet of records. Jones, *Records of a Nation*, 18–22.

[7] quoted in Jones, *Local Government Records*, 27

and financial rights of Government and of persons directly affected by the agency's activities."

Since the Hoover Commission regarded the managing of records as a housekeeping function, the National Archives, now the National Archives and Records Service (NARS), was assigned to the General Services Administration (GSA). Under the direction of the Administrator of GSA, NARS was to ensure the maintenance and security of records deemed appropriate for preservation, facilitate the segregation and disposal of records of temporary value, and promote the efficient and economical utilization of space, equipment, and supplies needed for the purpose of creating, maintaining, storing, and servicing records.[8]

As state archives looked to the National Archives for leadership, they too began to develop procedures for records management. Several states adopted laws based on the 1950 Federal Records Act and the Council of State Governments encouraged this activity by including a model records management act in its suggested legislative program for 1960. By 1963, more than half of the states had passed legislation concerning records management.[9]

Legal Definition of Government Records

The language used to define a public record is fairly standard in federal and state law. It varies somewhat from jurisdiction to jurisdiction, of course, but generally reflects that in the Federal Records Act:

> "...all books, papers, maps, photographs machine readable materials, or other documentary materials, regardless of physical form or characteristics, made or received by an agency of the United States Government under Federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the Government or because of the informational value of data in them."[10]

Many of the laws also describe certain other types of documents that are to be considered non-record materials. In federal law, non-record materials include "library and museum material made or acquired and preserved solely for reference or exhibition purposes, extra copies of comments preserved only for convenience of reference, and stocks of publications and of processed documents."[11]

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[8] P.L. 754, 81st Cong., 54 Stat. 483

[9] Posner, *American State Archives*, 337–8. Several states had adopted provisions of the Federal Records Disposal Act of 1943, authorizing the use of general records schedules, and later the Federal Records Act of 1950 covering records management. Posner, *American State Archives*, 309. The influence of the federal experience was increased no doubt by the large number of state archivists appointed during the 1940s and 1950s who had begun their careers at NARS.

[10] 44 U.S.C. 3301

[11] George Bain judges 24 states to have detailed and explicit definitions of a public record and 16 to have detailed but somewhat ambiguous definitions. He found only two states, Hawaii and Louisiana, to have no definition at all in law. Bain, "State Archival Law," *American Archivist* 46 (Spring 1983): 166–7.

Functional Categories of Government Records

Government records naturally reflect the functions that create them. Most fall into one of three categories: policy records, program records, or housekeeping records. There are distinct differences in the reasons each type is created and handled by the agency. Those differences are reflected in their later treatment and lead to different records management and archival problems.

Policy Records

Policy records are generated at the highest level of an agency and usually emerge from offices directed by elected officials or political appointees. While they constitute only a small portion of the total volume of records, they obviously have critical importance both for the continuing operations of an agency and for an historical understanding of public policy. Policy records should include the speeches of the agency head, reports, memoranda, briefing materials, and correspondence.

Because of the rapid turnover at the highest levels of government, files of policy records that remain in the agencies often do not contain such documents or exhibit much continuity. In addition, files maintained by elected officials or their appointees, such as cabinet secretaries while in office, usually contain substantial amounts of political and personal material along with the documentation of official government business. Difficulties in distinguishing between these different records lead officials to take most of the files with them when they leave office except for those that are obviously and purely official. For many years before the Nixon controversy raised public awareness about ownership of official records, the bulk of the materials sent to state archives by departing governors often consisted of little more than copies of speeches and press releases, budgetary authorizations, announcements of pardons and extraditions, and appointment papers for various public officials. There was little substantive correspondence and virtually no documentation of policy development.

The fact that high level records are rarely left in the agency or sent to the official government archives does not mean that they always are destroyed. Many government officials are sensitive to their place in history and want it preserved. Their papers often are donated to private manuscript collections or to one of the presidential libraries. However, it should be noted that under these conditions, the official has a greater opportunity to "weed" collections and control their use [12]

[12] Conversely, records in private collections may be more accessible than those still in government custody. James Bamford's *Puzzle Palace* (1982), a history of the National Security Agency, relied heavily on the papers of William F. Friedman in the George C. Marshall Research Library, a private repository in Lexington, Virginia. NSA has since reimposed security classifications on many of the documents Bamford used despite their publication in his book.

Program Records

Program records are produced by agencies in the course of implementing policy. These records, the heart of an agency's documentation, are usually generated by career civil servants. They include information gathered by agency staff (interviews, statistics, experimental data, examination results) material submitted by outsiders following specific laws and regulations (environmental impact statements, tax returns, RFPs, annual reports), and the reports, summaries, recommendations, etc. that analyze these materials.

The overall continuity of these records reflects the fact that staff and functions generally proceed with little disruption regardless of changes at the top of the agency. The Social Security Administration continues to issue checks; HUD continues to approve FHA mortgages; NIH continues to conduct research into the causes and prevention of diseases. Obviously change does occur, but it happens more slowly. It may take a year or more to process all the paperwork to effect a major reorganization or abolish an office within an agency. This continuity in functions leads to a greater continuity in the records produced. The records are therefore easier to manage. Comprehensive record schedules (discussed below) often concentrate on program records. The bulk of the records that ultimately are sent to the public archives are program records.

Housekeeping Records

The functions documented in housekeeping files are duplicated in nearly every government agency; differences in programs or missions have little or no effect on the structure or contents of these records which in fact may be dictated by an oversight agency. They include personnel files, building maintenance records, and budget and other fiscal materials.

In most cases, housekeeping records, routine in nature, are not considered permanently valuable. Certain fiscal records are retained several years to satisfy audit requirements but then are destroyed. Personnel records may be kept longer, especially if they affect pension rights. But the key word here is "routine." Many of the records sent to records centers fall in the housekeeping category having a clearly defined retention period after which they can be routinely destroyed.

The Process of Appraisal

Archivists decide which records should be placed in a government archives and which may be destroyed through an appraisal process. In making their decisions, they consider several factors.[13] First is the importance of the records to the continuing operation of the government. Certain records must be kept because of their legal, fiscal, or

[13] The National Archives has developed guidelines to assist in the identification of permanent records. They are reproduced in the Appendices.

administrative significance. Other records may have outlived their immediate importance to the government but for a variety of reasons may have long-term value to persons outside the government.

The information contained in government records can be of vital importance to both private citizens and empirical researchers. For example, when social security and other old age pension laws were passed in the 1930s, governments at all levels were beset by requests for information that could help prove dates of birth. Birth registration records were helpful when they existed, but many had to turn to the 1880 federal census which proved they were alive in that year and showed their ages. More recently, the report of the Commission on the Wartime Relocation and Internment of Civilians stimulated hundreds of Japanese Americans to seek documentation concerning their own internment during World War II.[14] Epidemiologists also rely extensively on data collected by government in vital statistics, environmental protection, public health, and labor offices when investigating the incidence and cause of disease among segments of the U.S. population. The vast number of statistical collection programs generate raw data that is used over and over again often for purposes far different than those for which it was originally created.

Archivists also must consider the evidential value of records. The structure of the records as well as their contents can be instructive as to how and why the government operated in a particular manner. Historians, political scientists, and students of public administration perhaps benefit most from evidentially significant materials, but they also are of crucial importance to plaintiffs in litigation with the government.

While every document can be said to have some value, everything cannot and should not be saved. NARS has estimated that only three percent of all federal records are worthy of permanent retention.[15] In appraising records, archivists traditionally have balanced the relative value of a series of records against the cost of preserving it. A very voluminous body of records may occupy more space than practically can be assigned to it. They also have considered the likely uses to be made of the files. If the records will be too difficult to use because of a complicated filing scheme or faded writing, no researchers may be willing to spend the time to dig for the information they contain. Finally, a judgment may be made about the same information contained in two different media — raw census forms and encoded computer tapes, for example. Keeping the tapes instead of the forms not only will result in significant storage savings but also will make it easier to use the data because it readily can be manipulated.

As more information is stored on microfilm or electronic media, physical accumulation no longer will be a driving force behind ap-

[14] Norton, *Norton on Archives*, 21--22. The Committee report was issued in two parts, *Personal Justice Denied, Findings* (Part I) and *Personal Justice Denied, Recommendations* (Part II), (Washington GPO, December 1982 and June 1983)

[15] A recent analysis by Gregory Bradsher conducted for a NARS task force on appraisal, indicates that the actual quantity of records declared permanent over the years has been closer to 1–2 percent

praising and destroying unnecessary records. It could be easier and often cheaper to let a backlog of microfilm accumulate than its much more voluminous paper equivalent. These records, randomly filed and poorly indexed, could be virtually unusable. Thus, it is worth noting that while storage problems stimulated the development of records appraisal, other factors continue to make it imperative to examine carefully the documentation designated for permanent retention.

Records Schedules

The process of deciding what to keep and what to destroy generally begins with preparation of a "records schedule" by each agency.[16] A schedule lists each type of record created by the agency, assigns a specific time period during which the agency will retain it, and instructs the agency as to its ultimate fate—destruction, temporary storage, or transfer to the archives.

Once a particular series of records is identified and given a retention period, there is not much need to go back to it again, except for cursory review, unless the function changes significantly. Hence the decisions of appraisal—what to keep and what to throw away—are made in order to prepare schedules or to update them occasionally. Records personnel within the agencies then protect or destroy records according to the schedules.

The National Archives sought and obtained approval in 1943 to develop generic lists of records common to several or all agencies with disposal recommendations.[17] These became known as "general records schedules" and now cover approximately 30 percent of all federal records. Many state and local governments have followed the federal example. General records schedules frequently concentrate on housekeeping records because they are easily segregable and can be destroyed routinely after a set time period. These generic lists usually cover materials such as personnel files, procurement records, travel vouchers, and mailing lists—records that document functions performed by *any* agency regardless of its program responsibilities or mission. Use of general schedules also helps promote uniform practices among all agencies.

Several states have developed manuals for local records that incorporate general records schedules for records common to all local governments in the state.[18] These manuals also contain guidelines for establishing and administering local records programs, descriptions of services provided by state archival and records management agencies to local jurisdictions, and summaries of laws and regulations governing local government records.

[16] In 1983, NARS estimated that approximately 8 percent of all executive branch records were covered by records schedules

[17] Granted under the Records Disposal Act of 1943 (U S C 3309)

[18] One of the earliest states to issue such a manual was North Carolina which did so in 1960 and has continued to revise it Recent examples includes manuals covering municipal records that have been prepared in Wisconsin (1980), Ohio (1981), and Iowa (1982)

Federal and most state laws require the approval of a central records official or board before any action is taken to destroy or transfer government records. At the federal level, formal approval of records schedules is based upon reviews by the staff of NARS's Records Disposition Division. The processes followed by the states vary, but many of them have records boards or commissions that must review and approve all schedules.[19]

Several states have reported problems in the scheduling process when the archives and records management functions are separated. Such a situation was described in the National Historical Publications and Records Commission (NHPRC) assessment project report from Minnesota. It noted that scheduling without archival input tends to concentrate on "current, ephemeral, high bulk records material." This emphasis may meet the records management goal of recovering storage space and filing equipment by disposing of records of short-term value, but it comes "at the expense of attention to older, less 'visible' material that [is] more likely to have archival value."[20]

The preparation of schedules has proved to be an efficient way to deal with the enormous volume of records generated by governments and modern institutions. However, shortages of personnel often make it difficult for the schedules to be updated as new types of records are created or agencies reorganized. Currently, the division in the National Archives principally responsible for appraising records has only 19 archivists to cover more than 500 federal agencies. An additional five archivists are assigned the task of appraising machine-readable records, and they must combine that work with other duties. Although NARS estimates that only 15 percent of all federal records currently are unscheduled, those records present some of the more complex appraisal problems.

II. Implementation of Government Records Programs

Placement of the Central Records Agency

As central archival agencies were created, a place for them had to be found on the organizational chart. The subsequent development of records management programs created new organizational problems. Decisions on where to place the archival and records management functions have had a significant impact on the subsequent effectiveness of these programs in the federal and state governments.

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[19] One of the major points of concern about local records is that there is a widespread lack of control over their destruction. Local government officials in several states are still able to decide independently what records to keep and what to destroy. Even in jurisdictions requiring approval from a centralized authority before destruction can occur, many officials disregard or are ignorant of these regulations. Resources in state agencies are often insufficient to monitor lack of compliance or follow up on known violations.

[20] Minnesota *ARP*, 40

Some chose to create entirely new agencies, others merely assigned the responsibilities to an existing office.[21] In some cases archives and records management are handled by the same agency; in others, they are split.

Generally, governments have chosen one of four organizational models:

(1) *Delegating to one executive branch agency or official the authority to acquire and maintain records from all other agencies.* States frequently designate the secretary of state who is traditionally the keeper of many official records even in the absence of formal archival responsibility (e.g., enrolled laws, corporation charters, election returns). This placement gives the archival agency direct ties to ongoing government activities and, in some cases, a measure of political clout. In addition, when the archives is placed under a political appointee or elected official, it is more likely to have responsibility for records management and influence over how records are created. The disadvantages to this arrangement arise when the department head is unsympathetic to the cultural and historical aspects of the archives or, worse, brings overt political considerations to bear on the management of the agency. Personnel actions based on political affiliation also are more likely to occur.

(2) *Establishing a separate historical agency within the governmental structure.* This was the model chosen by many of the southern states in the early 20th century as well as the federal government when it created the National Archives in 1934. In the states, such historical agencies are usually involved in a range of historical and cultural activities, including archives and manuscripts, natural and social history museums, historic preservation and sites, and historical editing. Establishment of a separate agency can be an ideal choice. Such agencies can operate as integral parts of the government yet remain outside the control of officials who would impose undue political or fiscal constraints on its operations. They are best served by a director who is professionally trained but able to work with the chief executive and legislative body to obtain the necessary resources. On the other hand, an archival and historical program operating in a separate agency can lead other government officials to see the program as extraneous because it is not tied to an otherwise powerful office. In addition, because of the historical emphasis, records management and related activities may be separated from the archival program and assigned to the management or fiscal officer for the executive branch.

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[21] By 1930, Margaret Norton found that most states had passed some kind of legislation regarding the care of their records and had assigned responsibility as follows: 10 states delegated archival work to the state library, 10 delegated it to some elected state officer, usually the secretary of state, or else left it in the hands of the departments to care for their own records, 14 had created a separate board or commission, and practically all the others had granted authority to the state historical society. It is worth noting, however, that despite passage of legislation in nearly every state, Norton credits only a dozen with actually giving sufficient care to their official records. Norton, *Norton on Archives*, 3–4

(3) *Chartering an existing historical society to collect public as well as private documents.* Officials who saw public archives as useful primarily for historical purposes often chose to assign responsibility for their preservation to an historical society already in existence. Many were started by private individuals or groups and remain only quasi-public. Archival programs assigned to quasi-public historical societies are more likely to suffer from lack of regard by other government officials. The further removed the archival program becomes from the daily operations of government, the less cooperation it will receive in seeking to control current records practices or efficient disposition of non-current materials. Fortunately, some agencies that began as privately organized societies have evolved into bodies indistinguishable from the strong historical commissions described above. When they have languished, however, it may well be because of the essential conflict over entrusting public records to private hands. Many local governments have chosen to donate their archival records to entirely private historical societies. In these cases, the societies make no pretense at delivering a comprehensive records program to the local government. They merely serve as the final custodian for historical materials. Records management, micrographics, and related activities, when they exist, operate separately from the archival function.

(4) *Assignment of the state archives to the state library.* The state library's functions are similar, at least on the surface, to a state archives. It stores books and documents in secure space, acquires material of interest and utility to government employees, and responds to reference requests for information from its holdings. The placement of state archives in the state library seems to have resulted in the fewest problems over time. The stronger programs under this arrangement have led to a good bit of autonomy for the archives. In some cases, the state archivist has been granted coequal status with the state librarian under a larger department supervising both.[22]

Legislative Basis for Authority Over Records Programs

One of the most commonly heard complaints among government archivists and records administrators is that they do not have sufficient authority to operate their programs. They cite the need, first, for clear and comprehensive laws and, second, for adequate resources and recognition to carry out those laws.

Many states seem to suffer from an inadequate legislative base for their archival and records management program. Too few state laws provide sufficient authority to require the implementation of records schedules and the transfer of historically significant records to an archives. As Edwin Bridges, state archivist of Alabama, pointed out

[22] The NASARA Statement of Principles for State Archival and Records Management Agencies (See Appendices) asserts that subjection to "the priorities of some other professional undertaking" such as the library or museum has a negative effect on records programs

recently, state records laws are generally "passive and permissive." They merely "designate the archival agency as the repository for the state's historical records and allow other agencies to deposit their records in it."[23]

Another common problem is that laws do not always apply to every branch of government. In many cases, records legislation covers only the executive branch. The legislative and judicial branches may choose to transfer material to the archives, but are under no obligation to systematically review and retain documentation of their activities. The Federal Records Act, for example, does not apply to Congressional records and, even though deposited in the National Archives, the records remain under the control of the Senate and House of Representatives.[24] States which have separate elections for several executive branch officers may find their laws do not even cover all of those officials. Application to records created by local governments is even more erratic.

While some jurisdictions suffer from too little legislation, others suffer from too much. Hundreds of laws may be in effect that have a single clause or two relating to records. For example, legislation creating a temporary board may designate custody of the records at the conclusion of its work. Regulatory agencies frequently require reports from the organizations they oversee and specify filing requirements. A records agency attempting to develop a consistent records policy applicable government-wide may find it very difficult to coordinate all of the individual requirements set forth in these laws. In addition, the federal government enacts laws that affect record-keeping practice at the state and local levels. State records managers must not only know the regulations passed in their own states but also, for example, those issued by the U.S. Departments of Housing and Urban Development (for public housing agencies), Health and Human Services (for public health, vital statistics, public assistance, and others), Education (school statistics), Transportation (highway and airport use), and the Environmental Protection Agency (air pollution reports).[25]

One of the most persistent problems in government records programs is the determination of exactly what constitutes a public record and who decides. Major problems arise when there are disputes over the interpretation of the definition of a record and no clear designation of a single authority (such as the chief archivist) to make the final decision. This issue has plagued the National Archives during the last few years. Authority to determine records status was

[23] Edwin C. Bridges, "The 1982 NHPRC Assessment Projects Reports: An Analysis of the State Records Programs," an unpublished paper prepared for delivery to a meeting of project coordinators, Atlanta, Georgia, June 24, 1983, 5.

[24] Worth noting, however, is that the only records specifically required to be kept by the U.S. Constitution and many state constitutions are journals of the proceedings of the legislature.

[25] NARS's Office of the Federal Register ceased issuing one of the most useful publications in this area, the *Guide to Records Retention Requirements*, in 1982 because of budget cuts.

removed from the Archivist of the U.S. when the Federal Records Act of 1950 was amended in 1978, but the authority was not reassigned elsewhere. Two recent judicial decisions underscore the current ambiguity. In 1980, NARS challenged Henry Kissinger's right to remove from the State Department transcripts of the phone conversations made while he was Secretary of State. The Archivist stated that at least some of these transcripts contained information about official government transactions and therefore were public records. The State Department position was that the transcripts were personal papers. The Justice Department ruled that the originating agency, not GSA/NARS, had the authority to determine the definition of a record. In subsequent FOIA suits, the Justice Department has consistently adhered to this position.

But in another recent case, a federal judge took the opposite view. In deciding a case in which the scheduled destruction of FBI field office case files was implemented without direct archival involvement, Judge Harold Greene stated that "it is clear that the independent professionals of the National Archives and Records Service (Archives) are the final arbiters of that which is 'appropriate for preservation' from the government's point of view."[26] New legislation to clarify this question of authority has met with some opposition from agencies that would like to follow the example of the State Department.

Ability to Enforce Existing Legislation

Even with the best legislation, there is no guarantee that a government records program will succeed. It is easier to pass good laws than to ensure their implementation through adequate appropriations and administrative support. In cautioning against judging the value of a records program based on the adequacy of legislation, George Bain points out in a recent article that if a government has "a fully comprehensive law but does not provide the resources to meet this commitment, the reality may make a mockery of the law."[27]

Traditionally, archival and records management programs have been plagued by a disparity between resources and responsibilities. Archives and records management work is particularly labor intensive; 90 percent or more of an archives budget, over and above such fixed costs as utilities and rent, commonly goes to personnel costs. Other government programs often can save money by delaying purchases, eliminating travel, or reducing office space. Cuts in an archives budget almost automatically mean a cut in staff.

Many state archives and records management programs have found their responsibilities increasing while their budgets shrink or

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[26] Letter from Robert Warner, Archivist of the United States, to Chairman, Joint Committee on Historians and Archivists, Mar. 29, 1983. Letter from David F. Peterson to Anna K. Nelson, May 21, 1984. The Supreme Court ultimately decided for Kissinger.

[27] Bain, "State Archival Law," 174.

remain static. An assessment of the Georgia Department of Archives and History noted typically that "since the Department was created in 1918, its legislative mandate has been periodically expanded—usually without complementary increases in allocated resources—to such an extent that a reasonable balance between obligations and resources no longer exists."[28]

Even more dramatic is a recent action in Nevada. The legislature passed The Archives and Records Management Act of 1983 which created a new Division of Archives and Records and charged it with the development of "a comprehensive records management program in the Executive Branch." At the same time, however, "it also eliminated the position of Chief of Records Management and reduced the new Division to only one professional and one-and-a-half technicians."[29]

There is almost universal agreement that the most effective records programs are those that rely on face-to-face meetings between personnel in the creating agency and staff of the central records agency. It is hard to argue with the value of basic records management techniques and most officials are glad to adopt them when offered a little assistance from the central records agency. The disturbing reality is that most central records agencies have few people to devote to such liaison work. Minnesota has only one full time person assigned to this function; Illinois has five.[30]

One of the key provisions added to the Federal Records Act in 1978 was the authority granted to NARS to inspect federal agencies for compliance with appropriate laws and regulations. The proponents of the provision knew the important role of monitoring in the implementation of a successful records program. Necessary resources failed to accompany the new mandate, however. The same 19 archivists in the Records Disposition Division assigned to appraisal are also responsible for conducting these inspections. To date, NARS has only been able to inspect an average of five agencies per year, meaning that every agency reasonably can expect a visit once per century—hardly an incentive to maintain an effective program.

Records Programs in the Agencies

Federal and many state regulations require the designation of a records officer within each agency. He or she is supposed to serve as the internal "expert" in records management activities, inventorying and scheduling records, arranging for their transfer to the records center or archives, instituting improvements in paper flow, and training new clerical personnel in filing procedures. The records officer may also control or participate in the development of micrographics and word processing applications.

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[28] Georgia *ARP* draft, 98

[29] "News from the States: Nevada," National Association of State Archives and Records Administrators *Clearinghouse* 6 (September 1983): 4

[30] Minnesota *ARP*, 8

The background and credentials of the individuals designated as records officers vary widely, ranging from certified records managers who began their careers with the central records agency, to long-time clerks in the central file section who know only their own methods and have received no other training or experience. The central records management agency usually spends a good part of its resources offering training courses for agency personnel. During fiscal year 1982, the National Archives offered 100 workshops on files maintenance and records disposition that reached 1,500 federal employees. The Minnesota Records Management Division trains 250 state employees each year in regularly scheduled classes on records, forms, and micrographics.[31]

The authority and placement of the records officer are as important to the success of an agency's records program as they are to the success of the central records administration. Records management activities that function as part of a high level staff office — the assistant secretary for administration, for example — and receive full support from top management are much more likely to achieve their goals than are those in less visible positions.

However, highly visible and well-supported agency records programs are the exception rather than the rule. Too many programs rely on a single individual who never may meet the agency head or any of his or her chief deputies. Records managers usually occupy such low level positions that they rarely have access to the records of high government officials. Being designated the agency records officer is rarely a high status symbol. The situation in Kentucky is typical: "... frequent turnover of agency records officers, their lack of records management skills, and low visibility have limited program accomplishments."[32]

Relationship Between Archives and Records Management

Over the years, the relationship between archives and records management has been a continuing source of concern and controversy. When records management principles began to develop, archivists were concerned that concentration on efficient storage methods and the disposal of unnecessary material would diminish the preservation of important historical materials. When efficiency prevails, it may become more important to save money than preserve documents. On the other hand, some records managers see archival concerns as an obstruction to the smooth running of cost-effective records programs.

Every government differs in how and where it differentiates between the responsibility for archives and records management. When federal records management legislation was first proposed, its

[11] National Archives and Records Service Office of Federal Records Centers *Fiscal Year 1982 Report to Congress on the Records Disposition Activities of the Federal Government (44 U.S.C. 3303a(f))* (Washington July 1983) 9 Minnesota *ARP*, 5–6

[12] Kentucky *ARP*, 18

proponents advocated establishment of a Federal Records Administration of which the National Archives would be a subservient part. Instead, in 1949, the National Archives became the National Archives and Records Service and the archivists were responsible for administering records management as well.

States were less bound by the presence of strong archival organizations as they assigned the newly authorized records management functions. Posner's report in 1963 noted that fourteen states had given full or partial responsibility to the already existing archival agency and six had created new dual purpose agencies to handle both archives and records management. But twelve had established an entirely separate program, usually in a department of finance, general services, or administration. Organizational placement of government archives and records management programs has remained fluid since Posner's 1963 report. In many cases, previously separated state programs have been joined successfully.[33]

Although many records managers remain unconvinced, government archivists are adamant in their belief that the archival and records management functions either must be combined within one agency or be under the authority of a single individual. They insist that in order to ensure that historically valuable records in fact do end up in an archival facility, the "life cycle" of records must be controlled in a unified system. On the federal level, as records management became subsumed by information management, the Administrator of GSA chose to separate archives and records management. In 1982,the Office of Records Management was removed from the National Archives and placed within the Office of Information Resources Management (OIRM). In fact, as a result of this change, responsibility for records is wrapped in ambiguity. While OIRM's Office of Office Information Systems (successor to the Office of Records Management) is responsible for designing records systems and other records related functions, NARS continues to bear responsibility for files maintenance, records appraisal and scheduling, and the operation of the Federal Records Centers. This muddy organizational pattern illustrates the difficulty of drawing a line between the management of current records and preservation of historically valuable documents.

III. Impact of Automated Information Processing Techniques

The Magnitude of Government Data Processing

The scale of data processing in the federal government is extraordinary and commands the attention of those concerned with the preservation of government records. Simply put, the federal government is the largest user of data processing in the world. In a 1981 study of federal ADP operations, Robert Head reported that there

[33] Posner, *American State Archives*, 337-8

were more than 15,000 computers.[34] By 1983, this number had grown to 18,000 mainframe computers. GSA reports that no one has yet been able to estimate accurately the number of word processors and micro- and mini-computers used by federal agencies. However, a recent estimate noted that by 1990, there will be a half million computers of all kinds in use by the federal government.[35]

To compare relative scale of federal operations with those of private industry, Head noted in his study that a comparably small operation like HUD spent $25 million annually on ADP, more than most Fortune 500 companies. The $100 million spent by a medium-sized operation like USDA is comparable to industry giants like Rockwell and Shell. And the $2 billion Defense Department ADP budget far surpasses the outlays of "even the very largest firms like General Motors." The Social Security Administration alone must maintain records for 200 million separate accounts and process payments for 35 million benefit recipients. The IRS maintains some 130 million taxpayer accounts.[36]

Obviously the number of computers at the state level is much smaller, but it is no less troublesome. New Jersey is fairly typical, reporting five mainframe computers operating in state agencies plus a large number of micro and mini-computers. Unfortunately, New Jersey and other states have too few personnel in records management to monitor the information accumulated by even this modest amount of hardware.[37]

Long-term Problems Created by Hardware and Software Dependence

The application of technology to record-keeping has introduced new problems in archival practice. Primary among them are the consideration of hardware and software dependence when determining the future disposition of a records system.

Hardware dependence occurs when a machine is required to view or interpret records, as is true with computer tape, microfiche, and videotape, among other media. Hardware dependence presents few problems when it involves a standardized process. Reading a 96 × microfiche card may not be possible with the naked eye, but we should always be able to find a magnification method even if it is somewhat cumbersome. However, rapid changes in technology and unique applications developed by single manufacturers have already led to significant problems in hardware dependence for computer-based files and are likely to present more in the future. By the mid-1970s, when the computer tapes containing the raw data from the 1960 federal census came to the attention of NARS, there were

[34] Robert V. Head, "Federal ADP Systems Atrophy in the Sinews of Government," *Government Executive* (February 1981) 36. Presumably, this did not include the large volume of data processing that is handled by private government contractors.
[35] *Government Computer News* (January 1984), 20.
[36] Robert V. Head, "The Complex Nature of Federal Data Processing," *Government Executive* (March 1981) 30.
[37] New Jersey *ARP*, 13.

only two machines in the world capable of reading those tapes: one in Japan and the other already deposited in the Smithsonian as an historic relic. The cost of converting the data to hardware-independent form so it could run on contemporary computer systems was large. NARS recognizes that it must constantly monitor advances in computer hardware so it can continue to provide access to its growing collection of federal records stored in digital form.

Another hardware-related problem is presented by the growing number of large-scale automated micrographic systems being employed by government agencies, including at the federal level the State Department and the Nuclear Regulatory Commission. These systems make microfilm or fiche copies of documents, destroy the original paper copies, and then provide access to the film or fiche via an automated index and retrieval system. The machines are capable of locating the proper frame and projecting the image simply through entry of the proper command at a computer terminal. Depending on the degree of hardware dependence, the National Archives may have to house the machinery along with the records or else be left with an enormous pile of film made useless because there is no alternate means of access.

Antiquated or lost machinery is not the only potential obstacle to the retrieval of automated information. Software dependence is also a problem. Data entered into a computer is necessarily in code, and in its original form that code is merely a string of positive or negative impulses. A human being wishing to read the information must be able to interpret the code and is therefore dependent upon software. Software dependence creates several problems. First, many computer programs and systems are insufficiently documented. Instructions processing the tapes may not exist or definitions of the codes may be missing. In racial codes, for instance, "B,W,O" might stand for "black, white, other" or "black, white, oriental." A second problem occurs when agencies use pre-packaged software systems to process data. The archives must then accession the software package along with the related tapes in order to process them or face significant costs in converting the data to software-dependent form. Software packages can produce even larger problems when they are designed to operate on specific types of computers, because that leads back to the hardware-dependence problems and the danger of the equipment being obsolete or unavailable.

There is every reason to believe that the computer industry itself now is moving toward standardization of equipment and that newer technology, such as laser disks, may help resolve problems in the future. Nevertheless, procedures should be instituted to care for those records now being generated under the chaotic conditions of the present.

The Use of Word Processors and Electronic Mail

A congressional report in 1978 estimated that "less than 15 per cent of the information that is used in decision making is in documented formal form. The other 85 percent is informal communica-

tion, personal letters, meetings and telephone conversations."[38] The use of personal computers and word processors in government offices could lead to even less documentation in paper form. Many transactions must be written down and communicated to others. For purposes of litigation, legislative oversight, or just continuity of policy, a record must be kept and be easily retrievable when needed. In an automated office, the information is entered into a personal computer. The text is then transmitted to another work station to be read by a second individual. That person may amend or add to the text by direct entry into the machine and then forward the revised "document" to another work station. The text may go through several stages of review and revision before it is printed on paper in its final form or it may never be printed on paper, if it is only for internal use. Currently, those who use computer terminals or word processors for textual material have little sensitivity to the fact that they are creating and destroying government records.

Electronic mail systems are now being installed in many government agencies. Since they usually are allocated to top officials rather than to the program staff, the most significant portions of an agency's documentation are the ones most in danger.

Archival Handling of Machine-readable Information

Even though there is a vast quantity of valuable information created and stored in automated systems, relatively few machine-readable records are included in the holdings of the National Archives and almost none in state archives.[39] Archivists widely acknowledge that such materials are overlooked frequently when preparing records schedules.

The staff of the National Archives began to recognize the significance of machine-readable records in the mid-1960s. In 1967, the Archivist appointed the Data Archives Staff and charged it with developing procedures for the handling of such records that had long-term value.[40] The strategies developed by this staff and its successor, the Machine-Readable Archives Division, served as early

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[38] U S Library of Congress, Congressional Research Service. Science Policy Research Division. *Scientific and Technical Information (STI) Activities Issues and Opportunities*, prepared for the Subcommittee on Science, Research and Technology of the Committee on Science and Technology, U S House of Representatives (Washington GPO, December 1978) 53

[39] The State of Wisconsin is the farthest along in developing a system for scheduling and accessioning electronic data, although a few other state archives are beginning to develop procedures for handling these records

[40] Charles M Dollar, "Machine-Readable Records of the Federal Government and National Archives," in *Archivists and Machine Readable Records*, edited by Geda, *et al* (Chicago Society of American Archivists, 1980) 30 In the early years of data processing, archivists and historians failed to recognize the potential use of many machine readable data files For many years, only summary statistical data was retained because of the belief that unaggregated statistics had already been fully exploited by the agencies that generated them As a result, punch cards containing raw data from such projects as the 1940 and 1950 federal decennial censuses were routinely destroyed

models for programs at the Public Archives of Canada and very recently in several states.

The staff assigned to machine-readable records reached its peak size around 1980 when 15 professionals were assigned to the division. Budget cuts in 1982 reduced the staff to its current size of seven professionals who must handle the full range of archival services, including appraisal, accessioning and reference. Clearly, the size of the staff has never been equal to the task. Of the approximately 10–12 million computer tapes now held by federal agencies, only 50 percent are currently covered by records schedules and only some 2500 tapes have been accessioned by NARS as permanent records. These statistics do not begin to reflect the large volume of information stored on floppy and hard disks.

Shift From Controlling Physical Volume to Controlling Information

Traditionally, records management has concerned itself with efforts to control the sheer physical volume of government records. The paper explosion began with the introduction of the typewriter and then carbon paper. Documents no longer had to be laboriously copied by hand. But the growth in volume increased geometrically when offices began to acquire equipment that could produce photographic and xerographic copies. Statistics on the annual accumulation of federal records clearly demonstrate the problem.[41]

Date	Estimated accumulation
1912	60,000 cu. ft. per year
1930	200,000 cu. ft. per year
1953	4,000,000 cu. ft. per year
1968	4,500,000 cu. ft. per year
1983	5,500,000 cu. ft. per year

The principles of records management that developed from 1940 to roughly 1970 concentrated on controlling this volume. Records schedules were developed to set fixed time periods for the retention of records and microfilming was encouraged as a means of reducing volume. Forms control and files management encouraged intervention as early in the life cycle of a record system as possible.

But the introduction of automated electronic information processing systems has led to a distinct shift in approach. By the mid-1970s, some 20 [illegible] of all federal records were said to be computer-based [illegible] e important, 50 per cent of all information processed by federal agencies at that time was processed by computers, and the volume was estimated to be increasing by six percent per year. If those figures held true, by 1983 75 percent of all federal government information was originated or manipulated electronically. There is reason to believe that state governments also are following this pattern.

[41] Statistics for 1912–1968 are quoted from Jones, *Records of a Nation*, 8–9. The 1983 figures are based on recent estimates by the NARS staff.

The growth in the physical volume of federal records has certainly continued since 1970, increasing the total from 28 million to 37.7 million cubic feet by 1982. But these figures do not accurately reflect the much more dramatic rise in the density of information. A single computer tape can contain as much information as 15 to 50 cubic feet of paper records. One hundred and ninety federal agencies reported holdings of 10.4 million computer tapes in 1982; the staff in the NARS Machine-Readable Archives Branch estimate actual holdings of the federal government at 10–12 million tapes. These occupy some three million cubic feet (or only 12.6 percent of the total volume of federal records) but contain the probable equivalent of 90 million cubic feet, more than two and a half times the information now recorded in paper form.[42]

It should be noted that legal definitions of records focus on the physical carrier of information rather than the information itself. This could become a critical distinction as more and more information is stored electronically. If there is no physical base on which that information is fixed, is there a record? In erasing a magnetic tape, one is destroying information, but the tape still exists. Prohibitions in the law against alteration of a record may obviate the problem. Obviously the intent of any records law is to manage and preserve, when necessary, the information contained in the record; until recently this could be done by controlling the physical document. But the changes in information storage and retrieval techniques may require us to clarify and perhaps rewrite our traditional definition of records

IV. Government Records and Government Information Policy

The past decade has seen the passage of several pieces of legislation designed to improve the organization of government information and citizen access to that information. This legislation has had and will continue to have considerable impact on the management and use of government records.

Freedom of Information and Privacy Acts

The first of these acts was the Freedom of Information Act (FOIA) passed by Congress in 1966. Actually, it had little impact until 1974 when several post-Watergate amendments clarified the intent of the act, provided for more rapid response to requests for information, and initiated a procedure for appeals regarding initial denials to information. In order to safeguard information, such as that pertaining to national security, personnel, trade secrets, investigations and confidential advice on internal agency matters, there are nine exemptions in the FOIA under which information can be denied the public.[43] The FOIA applies only to information in executive branch

[42] National Archives and Records Service *Disposition of Federal Records* (Washington, 1981) 1

[43] Yurow, *et al*, *Issues in Information Policy*, 10

agencies. It does not apply to Congress, the courts, or presidential papers. However, the passage of the Presidential Records Act in 1978 did establish a similar system for future presidential records.[44] By 1980, every state in the Union and several cities and other local governments had followed the federal example and passed some type of legislation concerning access to government information.[45]

While recognizing the desirability of free access to information, governments have an equal and sometimes conflicting obligation to protect the privacy of individual citizens. The variety and quantity of personal data held by government agencies is extensive. Governments began acquiring information about their citizens almost as soon as they were created. The federal decennial census began in 1790 as a means of apportioning representation in Congress among the states. Simple head counting grew into much more comprehensive data gathering, as government officials realized that a few more questions would allow them to evaluate a wide range of characteristics about the American citizenry. By 1860, every member of a household was named, and information about his or her occupation, education, literacy, and nativity was included. Meanwhile, the registration of vital statistics began as a responsibility of local government. In the late nineteenth century and early twentieth century, states began to take control of the registration of vital statistics and with a few exceptions, it remains primarily a state function today.[46]

Governments also have gathered information about their citizens in the course of investigations for law enforcement or national security purposes. Dossiers on an individual could be and were compiled without his or her knowledge. Ignorance about the existence of such information meant that false charges could not be defended nor corrections made to records. Meanwhile, the development of sophisticated data processing systems in the early 1970s made it possible to build enormous data banks of information. This raised the specter of an all powerful, centralized government with intimate knowledge about the activities of each citizen.[47]

The 93rd Congress responded to these concerns by introducing some 200 bills relating to personal privacy. Eventually, it passed the Privacy Act of 1974 which acknowledged the rights of individual citizens to obtain the information about themselves contained in government files. Under the Act, a citizen has a right to challenge and correct this information. In addition, the Act was designed to protect citizens from the use and dissemination of personal information contained in federal records. As originally drafted, the Privacy

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[44] Yurow, *et al*., *Issues in Information Policy*, 21

[45] The first executive order issued by Chicago's newly elected mayor, Harold Washington, contained liberal FOI provisions (Executive Order 83-1). Presumably the action was taken as much for political as for altruistic purposes in an effort to expose the less than admirable practices of earlier administrations.

[46] The cities of Baltimore and New York maintain their own vital statistics registration systems independently of their state systems.

[47] The State of Iowa has gone so far as to prohibit the automation of criminal intelligence and investigative data. Yurow, *et al*., *Issues in Information Policy*, 49

Act contained broad definitions of personal data and placed no time limits on the protection of this information. Had these provisions remained, the Act would have "in effect closed the doors of the National Archives to research."[48] Fortunately, the Act as passed exempted records in the National Archives.

State archives have had to be especially vigilant as their legislatures have considered similar privacy legislation.[49] Bills were introduced in New York and Minnesota during 1983 that would have severely restricted access to records in the state archives. One solution that has been adopted in at least four states (Georgia, Illinois, Oregon, and Utah) is to set a time limit, generally 75 years, after which any or most records in the state archives are automatically open for use.[50]

The Effects of Freedom of Information and Privacy Legislation

Freedom of information and privacy acts have had some unintended effects on the availability and use of government records.

By seeming to guarantee greater citizen access to government files, freedom of information legislation has encouraged some agencies to be more careful about the types of records they keep. As Thomas Mills of the New York State Archives notes: "It is a fact that since the passage of federal and state freedom of information laws in the mid-1970s, a great many police and other government surveillance records have disappeared." Some records are not being created in the first place; others are being deliberately destroyed. Mills cites the destruction in 1974 of 2 million surveillance files compiled over 50 years by the Los Angeles city police as just one of several examples.[51] The Los Angeles police department was not violating the law because

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[48] Thomas, "Federal Law and Access to Sources," 31. See pp. 330–333 for a discussion of the Privacy Act.

[49] A "Uniform Information Practices Code" (I) developed in 1980 illustrates how some state FOI acts might differ from their federal counterpart by adding several exemptions for records more common at the state than the federal level. These include "material used to administer a licensing, employment, or academic examination, if disclosure would compromise the fairness or objectivity of the examination process." It also exempts new categories that are significant because of technological innovation, such as "administrative or technical information, including software, operating protocols, employee manuals or other information, the disclosure of which would jeopardize the security of a record-keeping system." Additional exemptions are granted for "library, archival, or museum material contributed by private persons to the extent of any lawful limitation on the material," thereby protecting the rights of people who have donated their papers to a state archives to establish their own policies for use of their papers. It is worth noting that such rights have been enforced at the federal level by National Archives regulations despite the omission of specific exemptions in the federal FOIA. A copy of the Proposed "Uniform Information Practices Code" is available from the National Conference of Commissioners on Uniform State Laws, 645 North Michigan Avenue, Suite 510, Chicago, IL 60611.

[50] Bain, "State Archival Law," 173.

[51] Mills, "The Appraisal Decision on the New York State Non-Criminal Investigation Case Files," unpublished paper presented at the Society of American Archivists meeting, 1981, 1.

California did not then and still does not have any legislation prohibiting the unauthorized destruction of local government records But it certainly was violating the principles of access and accountability inherent in government records policy.

Many government officials and archivists also have contended that fewer controversial issues are committed to paper since passage of freedom of information acts, especially at higher levels of government. Since controversial issues in both the private and public sectors traditionally have been discussed and resolved in unrecorded private conversations, this has been difficult to prove.

Certainly at the federal level, the scope of the exemptions to the FOIA ensures the protection of such a wide range of information that there should be no danger of public scrutiny of controversial issues. However, there seems to be so little confidence in the exemptions that officials may, in fact, be keeping fewer records, to the detriment of agency needs.

Meanwhile, privacy acts have served unintentionally to hamper legitimate and important research efforts. Personal data can be of immeasurable use in public health and social science research. Vital statistics can trace the incidence and cause of diseases. For instance, epidemiologists can link information in death certificates with occupational data to show the prevalence of specific diseases among certain workers. Gaining access to this information has become more difficult because of the variety and conflicting provisions of privacy laws in the 50 states.[52] Fortunately, the electronic storage of information makes it relatively easy to "behead" the data, removing personal identifiers such as names and social security numbers. Additional precautions also can be introduced in a statistical file to eliminate inadvertent disclosure such as might occur by removing a name but otherwise providing detailed information (such as information about the only 35-year-old black female in an organization).

Paperwork Reduction Act

In 1980, Congress passed the Paperwork Reduction Act which was designed to control the amount of paper generated by the federal bureaucracy and reduce the excessive paperwork burden on citizens and organizations that conduct business with the federal government.

The Act developed from certain conclusions of the Commission on Federal Paperwork, one of which was that the federal government did not regard information as a valuable asset and therefore concerned itself with the control of information regardless of the medium. Sponsors of the Act wanted to establish mechanisms to encourage agencies to share data, to promote coordination among agencies

[52] See Alice Robbin and Linda Jozefacki comps. *Public Policy on Health and Welfare Information: Compendium of State Legislation on Privacy and Access* (Madison Data and Program Library Services, University of Wisconsin, 1983)

responsible for managing information, and to encourage policy level decisions concerning the design and use of automated systems.[53]

Perhaps unintentionally, the Paperwork Reduction Act impinges upon the preservation of government records in several ways. The effort to centralize and consolidate control over federal government information has reorganized the future management of government records under the umbrella of Information Resource Management. The Office of Information and Regulatory Policy (OIRA) was established within the Office of Management and Budget (OMB) to clear paperwork requests from every federal agency (with the exception of the Federal Election Commission). In addition, the office has oversight over statistical policy, automated data processing and telecommunications, and records management. In practice, the administrator of OIRA has chosen merely to assist GSA in coordinating records management policies with related information programs. The emphasis on managing information rather than records also has been responsible for the organizational transfer of records management from NARS to OIRM within GSA as noted above.

In addition to the establishment of a coordinating office within OMB, the Act calls for the designation of a high level official in each agency as the information resources manager (IRM). The clear intent of the law is "to combine traditional data processing operations with other functions such as records management, forms control, librarian and others concerned with information in all its forms."[54] Although many agencies have done little more than designate the chief administrative officer as the IRM official, this provision of the Act has the potential capability of restoring the records management function to an integral position within government agencies. However, for the most part, that has not yet occurred and in some instances reorganization simply has placed another bureaucratic layer between the records manager and top agency officials.

If traditional patterns hold, the successful implementation of the Paperwork Reduction Act will encourage the states to follow federal leadership. Several states recently have passed legislation that picks up key provisions of the Act. New Mexico initiated a data dictionary

[53] U.S. Commission on Federal Paperwork. *A Report of the Commission on Federal Paperwork. Final Summary Report* (Washington: GPO, 1977) 56. The Commission on Federal Paperwork concluded that past efforts had concentrated too much on dealing with the physical problems associated with the volume of records. The Commission felt future efforts should be directed at the intellectual challenge of controlling and providing maximum access to all types of government information regardless of what medium it is recorded on or where it is located. The Paperwork Reduction Act of 1980 responded to this in part by calling for a Federal Information Locator System (FILS), a system that would provide a central index to data collected by government agencies. If and when FILS ever becomes operational, it will prove a boon to archivists in deciding what records to keep because they will be able to tell immediately which series comprise the most comprehensive sources of data on particular topics. Unfortunately, the Office of Management and Budget has failed to provide the support necessary to develop FILS despite repeated urgings to do so from Congress.

[54] Robert V. Head, "The Computer Question: Do We Have a National Federal ADP Emergency?" *Government Executive* (April 1981) 45.

prototype system in 1983 that will include comprehensive information on state data — "what it is, where it is originating, where it goes, who uses it, who is responsible for it, as well as security and confidentiality restrictions and retention requirements."[55] The State of Michigan passed its own Paperwork Reduction Act in 1983.[56]

The technology associated with automated data and information management has been the driving force behind the radical shift in the control of government records. The ramifications of these changes are not yet clear. Currently, information managers rarely understand that they have certain obligations under the Federal Records Act. Instead, documents often are kept or destroyed according to the storage capability of a particular disk or computer. Meanwhile, traditional systems of records scheduling and appraisal, already overburdened and underfunded, rapidly may be rendered obsolete.

[55] "News from the States: New Mexico," National Association of State Archives and Records Administrators *Clearinghouse* (September 1983) 5

[56] "News from the States: Michigan," National Association of State Archives and Records Administrators *Clearinghouse* (December 1983) 4

Appendix II

Preservation of Government Records

A. Conservation: An Overview
Judith Fortson-Jones

Contents: Preservation Problems—Preservation Methods—Preservation Strategies—Attachment I: History of Papermaking—Attachment II: Recommendation of Guidelines for a Publishing Subvention Program—Attachment III: Intrinsic Value in Archival Material.

B. Technology Assessment Report
National Archives and Records Service, October 1984.

Contents: Introduction—Conversion, Storage, and Retrieval Requirements—Voice Recognition Technology—Optical Character Recognition—Digital Image Conversion—Raster Scanning Image Conversion Assessment.

These papers address the technical problems involved in the preservation of records or information of enduring value, an issue mentioned only briefly in the Committee report. The first paper was commissioned by the Committee; the second is an abridged copy of a recently completed study by staff members of the National Archives and Records Service.

A conservator restores an old record in the Documents Conservation Branch, National Archives

CONSERVATION: AN OVERVIEW

Preservation Problems

Introduction

The remaining records of Thomas Jefferson—consisting principally of his 22,000 letters—comprise a research collection that can be stored in one room. The records of Lyndon Baines Johnson, on the other hand, make up nearly 500,000 cubic feet of material in the Johnson Library in Austin, Texas.[1] This dramatic comparison serves to emphasize a major problem of archivists and records managers today: the preservation of an ever-increasing mass of government documents. Traditionally, preservation has entailed caring for information recorded on paper, and in most cases has meant simply providing storage and access. As the volume of materials has increased, however, so have the problems of preserving them. Not only have those charged with the care of government records discovered that the very paper on which the records are written is destined to self-destruct, but there is now also an array of other more transient media. This report concentrates on paper, since it remains the dominant medium and will probably continue to be so for some years to come. Existing and developing alternatives to paper are described, however, with recognition of conservation concerns related to them.

The Problems of Paper

Inherent Problems. Paper, an organic material, is composed of cellulose fibers made of long, thin, chain-like glucose molecules. Destructive forces cause these chains to break into shorter lengths, eventually making the paper weak and brittle. The primary reason for paper deterioration today, as indicated above, is acid hydrolysis, which causes splits in the polymer chains. This reaction may be responsible for an estimated 80 to 95 percent of the deterioration of archival and library holdings.[2] Acid in paper derives not only from residual chemicals from the manufacturing process but also from atmospheric sources that produce sulphur dioxide, nitrous oxide, hydrogen sulphide, and other products of combustion.

Other harmful reactions involve oxygen and/or light. Oxidation catalysts, like acids, promote the breaking of the cellulose chain, and discoloration and embrittlement result. Most of these catalysts (predominantly iron and copper) are deposited in paper by the metal

[1] John Calvin Colson, "Learning about Libraries and Librarianship," *Journal of Education for Librarianship* 24 (Fall, 1983) 79

[2] Richard D Smith, "Preservation Library Need and Industry Opportunity," *Library Scene* 9 (March, 1980) 10

beaters used to macerate the pulp; they also may be derived from the water used in the paper-making process. Light, particularly ultraviolet light, brings about a photochemical change—one that is obvious to anyone who has ever left a newspaper out on the front porch for a day or two. Lignin, the complex organic acid present in cellulose, is especially subject to this source of degradation; thus paper containing a high proportion of unpurified groundwood has a low rate of stability when exposed to light. Once again, cellulose chains are broken, and weakness, discoloration, and embrittlement result.

Environment and Handling. All of the aforementioned chemical processes are accelerated by high temperatures. Scientific tests indicate that for every 10° F decrease, the life of paper can be doubled. Humidity is another important factor; acid hydrolysis occurs much more rapidly with increased moisture. Improper environments also foster attacks by mold, bacteria, insects and rodents.

The importance of environment can be dramatically illustrated. A British experiment showed that books left in the Arctic for fifteen years remained in virtually their original form, whereas a similar set left in an industrial city showed rapid decay.[3] In contrast, a librarian in Guam stated that before his repository was air-conditioned, he was forced to replace his book collection every five years.[4] These cases point out the need for archivists and records managers to have the authority to establish adequate environmental conditions for their holdings. Cold storage, in fact, is considered by many to be an integral part of a legitimate conservation program, particularly in large institutions.

In addition to environmental problems, and to the "programmed" deterioration resulting from the papermaking process itself, there is another formidable enemy of paper: the people who use it. Due to neglect, lack of education, mismanagement, or simply carelessness, it is too often true that the caretakers of records, as well as researchers, are responsible for damage or destruction. The potential for damage to a document is present each time it is handled.[5] As Adso, speaking in *The Name of the Rose*, states, an excess of "curious love would make paper vulnerable to the disease destined to kill it."[6] This fact underlines the need to restrict access to certain fragile and/or valuable items in their original form.

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[3] Lewis H. Brown, *Paper Performance* (Boston: S.D. Warren Company, 1981) 6.

[4] Smith, p. 10.

[5] The emphasis in this report is on standard government records—that is, information recorded on letter- or legal-size paper. Often, however, records may be oversize, as with maps, architectural renderings, posters or drawings. The problems with these materials are compounded by their size: unless provided with mechanical support of some kind, they are likely to be torn or abraded during handling. Flat storage is more difficult to ensure, leading to the harmful practice of rolling or folding the documents. Furthermore, from the standpoint of applied treatment, there are added concerns of colored inks and dyes, and, for many architectural works, treated paper.

[6] Umberto Eco, *The Name of the Rose* (New York: Harcourt, Brace Jovanovich, 1983) 185.

Research and Standards. In 1957, the Council on Library Resources provided William J. Barrow, of the Virginia State Library, with funds for research on book paper quality. His results indicated that over 90 percent of the nonfiction books published between 1900 and 1939 will be irremediably deteriorated by the year 2000.[7] Spurred by this discovery, Barrow developed specifications for a permanent/durable paper with a pH of 6.5.[8] In the 1970s, the National Historical Publications and Records Commission developed its own specifications for archival quality paper, as well as for printing and bindings.[9] In addition to specifying a pH of 7.5, the specifications call for an alkaline buffer to prevent or retard subsequent acid formation. The Council recently has issued a report on book and paper longevity, and the National Information Standards Organization, through the American National Standards Institute, expects to publish standards for permanent paper for printed library materials in 1984. The standards will provide minimum requirements for acidity, folding, endurance, tear resistance, alkaline reserve, and stock.

In spite of these advances, most paper manufactured today is of very poor quality, due to the problems inherent in the manufacturing process. In 1492, Johannes Trithemius, protesting the increasing use of paper by religious scribes, asked: "If writing is put onto parchment it can last for a thousand years, but how long will printing something on paper last?"[10] In fact, there still exist scraps of paper made in China almost 2,000 years ago. But most contemporary paper, assuming normal storage and handling, has a life expectancy which may be limited to twenty-five to fifty years.

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[7] William J. Barrow, *The Manufacture and Testing of Durable Book Papers* (Richmond: The Virginia State Library, 1960).

Throughout this paper, many of the studies and statistics mentioned relate to books and/or libraries, rather than documents and/or archives. This is simply because most studies, to this point, have been carried out in libraries, a fact which emphasizes the need for increased attention to archival conservation. The results cited in this paper, however, apply equally to government records. If there is a difference, it is that such records would probably deteriorate even more rapidly than books, since most do not have protective coverings. Also, the conservation problems of archives are more complex because the holdings usually comprise a greater variety of materials—both in types of paper (e.g., carbon paper, computer print-outs, and blueprints) and the nature of some of the items (e.g., photographs, films, and parchment).

[8] "Permanent" paper is that which resists the effects of aging due to chemical action; "durability" refers to the degree to which paper retains its original strength even though subjected to use. The notation of pH indicates the hydrogen-ion concentration—a measure of acidity below 7.0, or alkalinity above 7.0. Current standards for permanent/durable paper require a pH of at least 7.0, which indicates neutrality, but one no higher than 9.5. See the *American Archivist* 38 (July, 1975): 405–415, for a summary of the Barrow Laboratory specifications.

[9] The NHPRC standards are based on the work of Barrow, the National Archives, and the Library of Congress. See Attachment II, "Recommendation of Guidelines for a Publishing Subvention Program," submitted to NHPRC 1 September 77 by Samuel D. Stewart.

[10] As cited by M. T. Clanchy in "Looking Back from the Invention of Printing," *The Quarterly Journal of the Library of Congress* 39 (Summer, 1982): 172.

History of Conservation

Introduction and Definitions. The term "conservation" may be defined as "the conscious, deliberate and planned supervision, care and preservation of the total resources of a library, archives, or similar institution, from the injurious effect of age, use (or misuse), as well as external or internal influences of all types . . ."[11] The National Conservation Advisory Council has described it as encompassing three general areas: (1) examination, or the preliminary procedure for determining original structure and materials comprising an artifact and the extent of its deterioration, alteration, and loss; (2) preservation, the action taken to retard or prevent deterioration or damage in cultural properties by control of their environment and/or treatment of their structure in order to maintain them as nearly as possible in an unchanging state; and (3) restoration, or the action taken to return a deteriorated or damaged artifact as nearly as is feasible to its original form, design, color, and function with minimal further sacrifice of aesthetic and historic integrity.[12]

Concern for preserving the written word is not new. Regardless of the media available to them, early record-keepers, as well as those of the present, were plagued by threats to the survival of recorded history. Clay tablets were easily chipped and broken and subject to boring by worms. Wood was eaten by termites, textiles rotted, and parchment mildewed. Even in 993 A.D., Sabur ibn-Ardashir's librarians in Baghdad used chemicals in an attempt to control termites. And, at an early date, Chinese law required an extract from the seeds of the cork tree to be included as an ingredient in all paper manufactured in the kingdom, in an attempt to ward off insects.[13]

Current Status of Conservation. In a 1963 survey of its research collections, the New York Public Library found that 50 percent of the books were in an advanced stage of deterioration. Library officials estimated that it would cost twelve million dollars (at that time) to make only the minor repairs necessary before patrons could use the books. Over ten years ago, a survey of the holdings of the Library of Congress indicated that as many as six million books were in advanced stages of deterioration. Such realizations and the added impetus of the damage to books and papers during the 1966 Florence flood, prompted more attention to conservation.

When the National Endowment for the Humanities and the Society of American Archivists joined in sponsoring a 1977 conference on priorities for historical records conservation was distinguished as the area "most deserving of outside funding."[14] A summary of findings of historical records assessment and reporting projects completed in 1982–83 affirms that the ". . . striking area of unanimity in

[11] Matt T. Roberts and Don Etherington, *Bookbinding and the Conservation of Books: A Dictionary of Descriptive Terminology* (Washington: Library of Congress, 1982) 64

[12] National Conservation Advisory Council, *Conservation of Cultural Property in the United States* (Washington: National Conservation Advisory Council, 1976) 31

[13] George Daniel Martin Cunha and Dorothy Grant Cunha, *Conservation of Library Materials*, Vol. I (Metuchen: The Scarecrow Press, Inc., 1972) 8

[14] Mary Lynn McCree and Timothy Walch, eds., "Setting Priorities for Historical Records: A Conference Report," *American Archivist* 40 (July, 1977) 345–46

regard to statewide functions and services was that of conservation In all its ramifications and permutations. this was clearly perceived as an urgent need. ."[15] Unfortunately, allocations of funds have usually not matched the stated concern. and conservation. particularly in archives and libraries. is still in its infancy.

Gordon R. Williams, director of the Center for Research Libraries. in reviewing the reasons that administrators have been slow to enact preservation programs, cited: (1) the lack of heavy patron pressure to improve the condition of materials: (2) concentration on *building* collections without attention to ongoing maintenance. (3) the non-"rare" nature of most deteriorating materials. even though they may be scarce or unique: and (4) the enormous volume which makes only mass treatment economically feasible. together with the lack of effective mass treatment techniques.[16]

Paper deterioration has been referred to as the "silent disaster." for, even though it continues unabated if not attended to, it often is not obvious until documents are retrieved for reference, and the paper crumbles in the researcher's hands. Since the daily progress of deterioration is not visible. administrators too often believe—or hope—that they will be able. with impunity, to postpone preservation activity for a few more years. Pressed by other demands, and without a formal tradition on which to build, they are lax in allocating funds for the preservation of materials.[17] Legislative bodies have been even slower to recognize the need for this kind of funding. As a rule. only the larger archives and records repositories (and not a large proportion of them) have full-time. trained conservation officers or staff conservators. There is a frequent dependence on outside funding for conservation; although this often provides an impetus for the establishment of programs. administrators must make a commitment to sustained support The responsibility for ongoing conservation cannot reside with foundations.

Conservation Education. Even if funding were miraculously increased overnight, there would not be enough conservation professionals to meet the demands of the many records repositories requiring their services. Although interest is growing, there are few educational opportunities. At present, there is no degree training program specifically designed for archival conservators. There are relatively long-standing programs for conservators in the arts. and there now exists a program at Columbia University for library and archives conservators and conservation officers. but the latter program emphasizes conservation in libraries Even though there is a

[15] Margaret Child. "Consultant Report Statewide Functions and Services." in "Documenting America Assessing the Condition of Historical Records in the United States." *SAA Newsletter* (May. 1984) insert. p 7

[16] Pamela W Darling. "Preservation A National Plan at Last?" *Library Journal* 102 (February. 1977) 447

[17] The New York State Archives and the New York State Library. in recognition of this deficiency. are nearing completion of a series of four workshops designed to educate administrators on their responsibilities for preservation policy and allocation of resources They have concentrated on the development and initiation of conservation policies and procedures. and how to integrate them into institutional frameworks The project was partially funded by the National Endowment for the Humanities

common body of knowledge and skills for these fields, there are also areas of concern specific to archives that are not now addressed through formal education

An alternative approach to coursework, though one that sometimes has been criticized as not sufficiently rigorous, is training through internships or apprenticeships. In any case, this route currently is also unavailable to most applicants There is now no archival institution that has the facilities and staff required to offer such training on a consistent basis. Archivists who seek a broadening of their skills to include simply the basic elements of conservation knowledge must usually attend workshops or seminars. The most notable of these are the regional workshops offered by the Society of American Archivists through its Basic Archival Conservation Program, supported by the National Endowment for the Humanities. From this program also came the only manual devoted exclusively to archival conservation. Current funding for the project, however, is scheduled to end in fall 1984.[18]

Preservation Methods

Mass Treatments

Deacidification. With staggering amounts of paper in dire need of preservation, there have been attempts to meet the demands with measures of equivalent proportions. The concept of "mass treatment," now prevalent in thought and research, refers to preservation measures that address large quantities of materials (as compared to individual hands-on attention). An early and ongoing manifestation of this focus on broad-scale treatment is the research on deacidification, a process that involves neutralizing acids present in paper and depositing a buffering agent to prevent or retard future acid formation. Deacidification for individual items has been a reality for more than fifty years. The treatment was refined and made more accessible through the research of William J. Barrow, then of the Virginia State Library, in the 1930s and 1940s, and by James Gear of the National Archives in the 1950s. Other methods have been developed over the years. All have been limited in application, however, because they are labor-intensive, and therefore prohibitively expensive on a large scale.

Within the past few years, there have been great advances in developing deacidification treatments that are applicable on a large scale. The Library of Congress, working with the National Aeronautics and Space Administration's Goddard Flight Center, has completed plans for a deacidification facility that uses two 7,500-book capacity chambers with a production capability of at least 500,000 books per year. This process utilizes diethyl zinc. Recent legislation authorized $11.5 million for the construction of the facility (at Fort Detrick, Maryland) necessary to treat the Library's collections. The Public

[18] Mary Lynn Ritzenthaler, *Archives & Manuscripts: Conservation* (Chicago: Society of American Archivists, 1983). NEH is now considering a proposal for the continuation of this project

Archives of Canada, working with Richard D Smith, has completed tests for a process that employs magnesium methoxide This operation, designed to treat 5,000 books per week on a twenty-four-hour, seven-day cycle, now is in regular use [19]

It should be noted that the costs for either of these mass deacidification treatments, although greatly reduced from the funding required for individual conservation, may nevertheless prove too high for many repositories. Another important point to be made about any deacidification process is that the treatment does not reverse damage that already has taken place: acid deterioration is stopped at the point of treatment, but the paper remains brittle and discolored. "If we realize the limitations of mass deacidification—that, at best, by slowing down the aging process it lengthens the life of paper two to six times—we see that deacidification is but a partial solution . . ."[20]

Paper Strengthening and Other Treatments. Two methods of imparting strength to weakened paper are now being tested. One, the Parylene process, is a method of paper strengthening that is being developed by Nova Tran, Inc. It deposits a strengthening agent in a vacuum, at room temperature, without catalysts. The other process, developed on contract for the British Library, utilizes an acrylic copolymer and initiates polymerization with a radioactive source. It increases the strength of brittle paper about seven times. More detailed data on these systems, and their effects on paper, are not yet available.[21]

Several methods of mass fumigation are currently being researched or used in this country, principally ethylene oxide, freezing, gamma radiation, and carbon dioxide. "Shrink binding," a method of surrounding deteriorated bound volumes with polyolefin film, is being studied by the National Archives. It has been used fairly extensively since 1977 by the Federal Archives and Records Center in Kansas City.[22] In addition, environmental controls themselves, especially cold storage, are considered to be mass treatments.

Reproduction of Information

Microforms. In evaluating materials for preservation, it is increasingly common to distinguish between "intellectual content" and "artifactual value " When a document has significant historical, legal, or monetary value, it should in most cases be preserved in its original form. But continuing financial restraints, scarce storage space, and

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[19] Current cost estimates at the Library of Congress are approximately $3–5/volume at The Public Archives of Canada, $3/volume Mass deacidification, to this date, has been used mainly for bound volumes Data on its application for unbound records is not available, but this does not imply that such treatment is inappropriate NARS is currently investigating this issue

[20] Carolyn Harris, "Mass Deacidification Science to the Rescue?" *Library Journal* 104 (July, 1979) 1423

[21] The information on these two processes was obtained from "Six New Mass Treatments." *The Abbey Newsletter* 8 (February 1984) 1

[22] Alan Perry, "Packaging the Problems in Kansas City," *The Abbey Newsletter* 8 (April, 1984) 25

the lack of enough trained conservators are barriers to preserving all items as artifacts. As a result, decisions often are made to retain only the information, or the "intellectual content," and the paper itself is allowed to perish in what William J. Welsh, Deputy Librarian of Congress, has referred to as a "planned deterioration program."[23]

For many years, archivists and records managers have been aware of the advantages of reproducing documentary information. In 1954, the National Historical Publications and Records Commission encouraged this approach to preservation through grant funding for publication of "documentary sources central to the study of American historical figures and themes."[24] In 1974 its historical records program was broadened to include support of archival preservation efforts. With this new charge from Congress, the Commission made a number of favorable decisions on proposals to preserve and make accessible documentary materials. The production of microforms was an important part of this work.

Reprography is a reliable preservation tool which can be used on a massive scale, and which significantly reduces record storage space. Information is not only retained, but often is made more accessible. When originals are retained after filming, they are protected from physical abuse because there is little or no need to handle them. The production of computer output microfilm eliminates the interceding paper stage altogether. And, most important, silver halide microfilm, when processed according to rigorous standards, is of archival quality. Silver halide is the only type of film now approved for archival purposes; diazo and vesicular film are acceptable for use copies.[25]

Unfortunately, reprography through filming is neither quick nor inexpensive (although both the time and costs involved are usually

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[23] *Library of Congress Information Bulletin* 41 (July 16, 1982): 206.

[24] National Historical Publications and Records Commission. *Microform Guidelines* (Washington: National Archives and Records Service, General Services Administration, 1980): 1.

[25] Black and white movie films bear some similarities to microfilm. Although they do not constitute a significant portion of most archival holdings, they do turn up with enough frequency that their preservation problems should be noted. Prior to 1951, nitrate base film was widely used; this film is highly susceptible to self destruction and is hazardous to store, since spontaneous combustion is possible. Most original nitrate film is now deteriorated beyond use. Cold storage is essential for its preservation; copying onto a polyester base is preferable, but costly.

The technology exists for the preservation of modern black and white films, but serious problems prevail with color film due to the transient nature of the color dyes. Cold storage for such films is almost as important as for nitrate base film. And, as with microfilm, permanent "security" copies of all film, to be stored in a controlled environment, are required in order to prevent scratches and distortions resulting from use.

Though photographs share the problems of film, they are also more complex. Not only does the curator have several bases to deal with (metal, glass, paper, or plastic), but also a variety of binding agents (most often gelatin, collodion or albumen) and various image-forming materials (pigments and metals or metallic salts). Photographs may range from collodion plates, cyanotypes, tintypes, ambrotypes and daguerrotypes to more modern platinum and silver gelatin prints. Their conservation is too diverse for even a cursory discussion here. For many archival collections, proper storage and handling procedures may be the only practical approach, since the services of a photographic conservator, or even the copying of prints and negatives, are expensive.

lower than individually applied conservation treatment). Time-consuming arrangement of records is necessary prior to filming, and additional care is required in handling items that have become fragile; some bound volumes must be disbound before filming. Legibility ordinarily is not enhanced by filming, and may be decreased. Variations in size or in image clarity of the original documents require frequent adjustments of the camera and lighting. And in addition to archival processing requirements, proper storage and handling procedures are vital for the preservation of film or fiche.

Some curators and users still are reluctant to accept microformats. Nevertheless, the production of microforms is an important way of preserving the information in the mushrooming stacks of paper produced by government units. In a number of cases, originals themselves should be preserved because of their intrinsic value. If they are to be discarded, recordkeepers must be certain that technical standards have been met and bibliographic guidelines followed to ensure quality and permanence.

Optical Disks Another current developmental effort by the Library of Congress is a three-year Optical Disk Pilot Project expected to be completed in 1984. The project is designed to evaluate the use of optical disk technology for information preservation and management, and to determine its costs and benefits for reproduction. A primary advantage of disk storage is the compaction it allows. The equivalent of 95,000 pages can be stored on the two sides of an optical disk. Other possible benefits are improved access and retrieval, decreased deterioration due to wear (since only a laser beam touches the disk during playback), image enhancement, and improved reproduction quality from disk to disk.[26]

Optical disk memory employs laser light to write data by burning holes in a variety of media, usually metals. It is the ephemeral quality of these metals that prompts serious questions concerning the stability of the images on them. Current life expectancy is severely limited in archival terms, since information must be rewritten every five to ten years. Many see this as an easily surmountable problem, since information stored on a disk can be transferred to another without distortion. But equipment maintenance and a continuing need to purchase updated machines may be a considerable financial burden for most repositories.[27]

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[26] "Optical Disk Pilot Program," Library of Congress (June, 1983) 1. *Library of Congress Information Bulletin* 206, for a review of optical data-storage systems, see Herb Brody, "Materials for Optical Storage: A State-of-the-Art Survey," *Journal of Micrographics* 15 (January, 1982) 33–36.

[27] This factor — together with varying hardware and software dependencies, missing or inadequate documentation, and a current lack of standards — influenced the recommendation of a special advisory committee to the National Archives that permanent records of all kinds be committed to human-readable media, i.e., to microfilm. "Strategic Technology Considerations Relative to the Preservation and Storage of Human and Machine Readable Records (DRAFT), prepared for the National Archives and Records Service by Subcommittee C of the Committee on Preservation, January, 1984, 2–3. See also Victoria Irons Walch, *Government Records Programs: An Overview*, prepared for the Committee on the Records of Government, February, 1984.

In addition to the drawbacks mentioned above, the disk as a medium of reproduction is now concentrated on high-demand information, a quality not characteristic of most government records, whose uniqueness may make them less adaptable to storage on disks. Since storing data on optical disks is relatively expensive, in conjunction with machinery costs, the system is not considered economically viable for information that is infrequently retrieved. For such information, microfilm would serve as well, at considerably lower cost, even though retrieval time is longer.[28]

The Smithsonian Institution is examining the possibilities of the laser-read photographic disk. First developed by McDonnell-Douglas Corporation, this medium shares the advantages of metallic disks. In addition, it may be more practical for in-house development, since standard, "off-the-shelf" components are used. Most important, moreover, the disks should have a greater life expectancy, equivalent to that of ordinary photographic emulsions. Photographic disks hold the same amount of information as metallic disks, and reportedly provide a higher-quality image. Specific data is not now available on this system, due in part to its use by military contractors and because commercial interests are at stake. Details of aging tests, equipment costs, and reproduction schedules are needed before endorsing archival use. Nevertheless, the photographic disk has promise as an alternative for the reproduction and storage of information.[29]

Preservation Strategies

Collection Management

Archivists and records managers have been slower than librarians to recognize the need for collection management as one means of preserving their collections. It is true that those dealing with governmental documents do not have all the options that librarians have: they cannot, usually, order duplicate copies of deteriorated items, refuse to work with dealers who do not meet their standards, or assume that another repository will have a preservation copy of a given item. Government records are often unique, if they deteriorate beyond use, the information they contain may be lost forever.

Selection for Retention. On the other hand, as stated earlier, not every document must be retained in its original physical state. Difficult decisions are required as to which items to preserve, once the

[28] It might be noted here that magnetic computer storage media are also not considered to be archival in quality. Unlike microfilm, they cannot be fixed, and are thus susceptible to alteration by stray magnetic fields. The images may be distorted by use, and the stability of the binder holding the magnetic particles to the plastic base is not established. In addition, the data they contain is easily amended or erased. Their main purpose is to provide back-up computer storage. These same physical problems pertain to magnetic audio and videotapes.

[29] This should not imply that the program is inexpensive. Current cost expectation for the integrated system is $100,000. Phone conversation with David Bearman, Smithsonian Institution, September 6, 1984.

intellectual content has been duplicated on some other permanent medium. A number of suggestions have been made to assist these decisions. The basic question is "What is the significance of this particular document?" Answers involve factors relating to physical condition; legal ramifications; whether the same information is available elsewhere, either in hard copy or in microform; and whether a particular item serves the objectives of the larger collection. The National Archives made a valuable contribution to the consideration of these factors by publishing a formal definition and nine criteria for establishing whether a document should be kept in its original format.[30]

The problem of selection for information retention makes even more critical the archival function of appraisal, as archivists are compelled to "acknowledge that the notion of conserving entire collections in their original format must be abandoned."[31] A reasonable system of selection and retention will ensure that when materials are discarded it is because they are not needed, and not because they have deteriorated too much for use.

Surveys of holdings can assist in evaluating the criteria—such as condition and significance to the whole—used for retention decisions, as well as for other purposes. Although time-consuming, surveys are important in establishing a systematic approach to collection management and to treatment priorities based on overall collection needs. Major areas of concern can be identified, work done more efficiently, and budgets planned more effectively. In addition, surveys carried out in a number of repositories would help to identify regional and/or national conservation needs, and thus facilitate cooperative efforts and planning. To date, few repositories have conducted surveys of the condition of their holdings.

Standards Enforcement. Another issue related to collection management is the enforcement of standards for paper quality. It is illogical as well as inefficient to spend large amounts of time and money on the preservation of information recorded on bad paper (and still not be successful in saving all of it), when many of the problems of deterioration would be eliminated if the records—whether printed materials, manuscripts, or copies—were produced initially on permanent/durable paper. In this situation, archivists should have an advantage over librarians. Libraries, in spite of their vast numbers, do not wield sufficient economic power to require that all books be printed in such a way that they will not self-destruct on the shelves. But archivists and records managers could be given the authority to require archival-quality paper for the production of all government records deemed important enough to justify retention in the original form. Standards established by the National Archives

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[30] *Intrinsic Value in Archival Material* (Washington: National Archives and Records Service, General Services Administration, 1982). See Attachment III.

[31] *Report to the Social Sciences and Humanities Research Council of Canada by the Consultative Group on Canadian Archives* (Ottawa: The Information Division of the Social Sciences and Humanities Research Council of Canada, 1980), 94.

and affecting the Government Printing Office, for example, would serve as a guide for all government agencies. Concern for preservation cannot be restricted to those records already existing, but to those of the future also.

Cooperative Conservation

Another approach to conservation is the establishment of consortia or centralized laboratories for the treatment of items from member institutions. Many see this as eminently practical, and, indeed, perhaps the only reasonable way of dealing with massive conservation problems, given existing limits on funding and trained personnel. Paul Banks, director of the training program at Columbia University, feels that "it may only be through cooperation that we can hope to tackle problems of preservation on a scale adequate to reverse the rapid deterioration of our collections," and sees such efforts as productive in the areas of acquisition, retention, and preservation responsibility; reproduction; and physical treatment.[32]

Regional conservation centers may be especially helpful to smaller institutions by providing technical advice, educational opportunities, and disaster recovery assistance. Members of consortia, moreover, could participate in cooperative purchasing and sponsor workshops, seminars and newsletters. Hilda Bohem, public services librarian at UCLA, sees possibilities for further and even more basic services to be provided by regional centers. Her suggestions include supervisory jobs, such as cleaning and inspection of physical facilities, which often are overlooked because of lack of time, training, or delegated authority.[33]

Although regional conservation laboratories do exist throughout the country, their emphasis has been, for the most part, on the treatment of single items. The primary need of most records repositories, however, is guidance and assistance in establishing institutional conservation programs.[34] The possible danger of regional services, in fact, is that their presence may discourage individual institutions from setting up their own in-house conservation programs. Regardless of the kinds and levels of assistance provided by

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[32] Paul N. Banks, "Cooperative Approaches to Conservation," *Library Journal* 101 (November 15, 1976): 2349.

[33] Hilda Bohem, "Regional Conservation Services: What Can We Do for Ourselves?" *Library Journal* 104 (July, 1979): 1430.

[34] One encouraging development on this front is the recently announced National Endowment for the Humanities grant awarded to the Southeastern Library Network (SOLINET). The goal of this project is to help libraries and archives develop, strengthen, and coordinate local conservation/preservation programs. The two primary objectives, according to Frank Grisham, SOLINET Executive Director, are (1) to promote the development or enhancement of local preservation efforts by providing information, training, field service or disaster assistance, and (2) to cooperate with other regional and national organizations in preservation activities. (SOLINET News Release, Southeastern Library Network, June 7, 1984: 1–2.) If the goals and objectives of SOLINET are met, this program will serve as a valuable guide for the establishment of similar programs in other parts of the country.

regional centers, ultimate responsibility for the preservation of holdings resides with each repository. And even though the centers may be non-profit, member institutions should not assume that the services provided in the area of applied work will be inexpensive. Conservation treatment is almost always labor-intensive, and therefore costly.

National Planning

National Programs. A recent report from the National Conservation Advisory Council (NCAC) asserts that ". . . the United States still is without a national policy or plan for conservation, the informed, skilled, and ethical care of cultural patrimony. It is virtually the only major nation in the world without a coordinated effort in this regard."[35] National coordination would help to prevent duplication of effort and would provide guidance in the establishment of priorities. Margaret Child, when serving as assistant director of the Division of Research Programs, National Endowment for the Humanities, urged archives and libraries to begin to organize and participate in national resource sharing programs. "I think," she stated, "archival repositories . . . should define their programs to encompass more than just the needs and pressures of their own institutions or organizations, their own localities, or their own states. We have to think at least on the regional level and even on the national level if we are to stretch the available resources to cover all the aspects of our society that deserve to have documentation collected, preserved, and made available."[36]

Although there may be debate over which need is greater—a national plan, or establishing programs in individual institutions—it is clear that the latter suffers from the lack of the former. This is evident not only in the absence of training opportunities, but of continuing education for archivists and records managers, support for technical and lay publications, and more general conservation-awareness programs for the public.

Organizations. National support for conservation is also lacking at an organizational level. There are, as the NCAC report points out, a number of national voluntary organizations that share a concern for conservation, including the Society of American Archivists, the American Association for State and Local History, the American Institute for the Conservation of Historic and Artistic Works, and the American Library Association. But there are few salaried individuals in these groups whose major responsibilities include conservation. Moreover, all these organizations, including the NCAC (now the National Institute for Conservation), are "subject largely to the funding

[35] *Proposal for a National Institute for the Conservation of Cultural Property* (Washington: National Conservation Advisory Council, Inc., 1982), v.

[36] Margaret S. Child, "Federal Funds for Archives: A View from NEH," *American Archivist* 45 (Fall, 1982): 470. The National Conservation Advisory Council has recently evolved into the National Institute for the Conservation of Cultural Property, Inc., and hopes to promote nation-wide cooperation in research and education.

policies and restrictions of private and public foundations. None has stable financial support. Political reality, public pressure, resignations of sympathetic board presidents or board members, or unwillingness to continue the support of important but no longer 'new' programs can shift the priorities of funding agencies."[37]

An indication of the need for a viable national organizational network, as well as strong leadership from the National Archives, is the importance of effective lobbying for archival conservation measures. Two examples illustrate this point. In 1979, President Carter issued a Presidential Order on Emergency Building Temperature Restrictions, requiring a 78° F minimum for cooling. This restriction would have had adverse consequences for records repositories, and efforts to prevent its application to cultural institutions eventually were successful. Another threat occurred when President Reagan's budget for fiscal 1982 omitted funding for the National Historical Publications and Records Commission, an agency that has played a major role in fostering the preservation of records. That funding now has been restored.

National Archives. Guidance from the National Archives has weakened in recent years due to budget cutbacks and internal problems. The Library of Congress has been the major institutional force in conservation research. Although the benefits of its efforts are clearly available to the archives world, technical research and support for archival conservation — original experiments and evaluation related to the specific conservation interests of archivists — would provide help for archival conservators. This situation is undergoing revision with the recent appointment at NARS of a Supervisory Conservator and two chemists with experience in the analysis of archival and conservation materials. Additional staff appointments are pending.

The National Archives has recently contracted for studies that should prove valuable to institutional conservators. The National Bureau of Standards published *Air Quality Criteria for Storage of Paper-based Archival Records*,[38] recommendations resulting from an analysis of environmental conditions in the National Archives. The Bureau also designed a sample survey for the paper holdings of the National Archives, defined by document condition, usage, and value, which has helped to establish priorities for preservation action.[39] This survey could provide a model for other institutions.

A subcommittee of the Committee on Preservation (a National Archives advisory committee) recommended that NARS sponsor a series of annual preservation conferences and a more active publications effort, including the publication of standard procedures, reports on standard materials, and NARS conservation methods and

[37] *Proposal for a National Institute for the Conservation of Cultural Property*, vi

[38] Robert G. Mathey, *et al. Air Quality Criteria for Storage of Paper-based Archival Records* (Washington: National Bureau of Standards, November, 1983).

[39] "Preservation Plan for Textual (Paper) Records at the National Archives and Records Service" (DRAFT), March, 1984, 1

practices.[40] These efforts would serve to "expand and intensify NARS' advice and counsel for and with all originators of potential archival materials and/or documents anywhere within the federal or national system." Given the authority and monetary support to enact the plans now being made, the Preservation Division of the National Archives would be empowered to "(a) advise the archivist of the United States on all matters pertaining to preservation; and, (b) direct programs of sufficient permanence that both the short- and long-term mission can be accomplished with clear focus unencumbered by organizational changes."[41]

Recommendations

The preservation of this country's government records is an acknowledged concern. Ten years ago, preservation issues seldom were discussed by archivists and records managers; today, they are recognized as an integral part of the responsibilities of anyone charged with caring for the records. Because conservation is a relatively new field, it is useful to examine its development at this point and to make recommendations for its future.

(1) *Education.* It is of primary importance to increase educational opportunities for archival conservation for personnel at all levels. Training must be provided for conservators, technicians and conservation administrators by initiating new programs, by adapting existing curricula in related conservation specialties, and by establishing apprenticeship programs in major archival institutions. Courses on conservation should be included in any training program for archivists and records managers as well, and continuing education through seminars and workshops must be made available to those already practicing.

(2) *Regional Centers.* The establishment of more regional treatment centers is not as urgent a need as it was a few years ago. Establishing centralized programs to provide advice and assistance for setting up individual conservation programs, however, is an area of concern. Another need is becoming prominent: regional facilities for mass treatment of records, including deacidification, cold storage, and microfilming or disk recording. Although unit costs of mass applications are lower than equivalent in-house treatments, the expense of acquiring such capabilities is far beyond what is possible for the majority of institutions. Only through regional centers will most repositories be able to obtain access to innovative conservation technologies.

(3) *Surveys.* Although the need for conservation is recognized, planning cannot proceed on the basis of impressions. National and regional programs, particularly, should be based on specific knowledge of the nature and extent of conservation needs. Surveys are useful in enabling individual repositories to evaluate their own prior-

[40] "Subcommittee 'A' Resolutions," July 6, 1983, 1–2
[41] "Subcommittee 'A' Resolutions," July 6, 1983, 2

ities, to determine broader issues and problems, and to substantiate budget requests. To these ends, surveys at representative repositories might be funded from the national level.[42] This would aid in the formation of a national plan of conservation, and perhaps in the establishment of some centralized services.

(4) *NARS*. The Preservation Division of the National Archives and Records Service should be further strengthened. A strong Preservation Division is vital not only because of its obvious responsibility for preserving many of the nation's most important records, but also for the guidance it could provide in the field of archival conservation. NARS is the logical institution to support scientific research and development, and to issue much-needed publications based on its findings. Furthermore, authority and funding will come more easily to state and local agencies if NARS serves as an example in this regard.

(5) *Standards*. Standards must be established for products and services related to archival conservation. NARS could be the leader in this endeavor also, making recommendations on the basis of its own or contracted research. Concomitantly, reco. epositories must have the power to enforce such standards. Requirements for the quality of paper to be used in the production of government records are a prime example, as are guidelines for environmental controls.

The records of government have special conservation needs, both because of their nature and their volume. The real extent of this multi-faceted problem may not be known, but there is no doubt about the continuing deterioration of the records. Wayne Grover, when Archivist of the United States, asserted that "The archivist has a moral obligation to society to preserve evidence on how things actually happened and to take every measure for the physical preservation of valuable records."[43] This mandate, part of "The Archivist's Code," clearly calls for the exceptional effort necessary to conserve the records of our cultural heritage, past, present, and future.

ATTACHMENT I

History of Papermaking

Writing began long before the discovery of a process for making paper. Throughout the prehistoric period, a variety of surfaces were used for recording the thoughts of humanity, including stones and walls of caves. From these ponderous media came a progression to clay tiles and wax or wooden tablets and, eventually, to papyrus, parchment and vellum — all before the invention of paper. These substances and a number of others served specific needs, but they all presented problems: they were cumbersome, fragile, or expensive. In China, from the first days of the written word, most court writing was on bamboo or fabric, usually silk. Because of their disadvan-

[42] An NHPRC-funded survey was conducted in 1980 at the Nebraska State Historical Society. See Judith Fortson-Jones, "Practicality Peaks for this Conservation Survey Method," *The New Library Scene* 1 (November/December, 1982): 1,4,ff.

[43] Wayne C. Grover, "The Archivist's Code," *The American Archivist* 18 (October, 1955): 307–308.

tages (awkwardness, on the one hand, and expense, on the other), a better medium was sought. The search continued until 105 A.D., when a Chinese court eunuch by the name of Ts'ai Lun announced to his Emperor the wondrous discovery of paper.[44]

Paper, by definition, is "a thin felted sheet . . . made from fibre that has been macerated until each individual filament is a separate unit."[45] The first paper made in the courts of China was formed by beating fibers (in that instance, probably from rags and scraps of hemp), mixing them with water, and draining the resulting pulp on a sieve or screen to produce the thin matted substance that came to be known as paper. Even the gigantic papermaking machines of today use essentially the same process. However, certain events and discoveries have had negative consequences for the longevity of modern paper.

During the earliest years of papermaking, and even of mechanization, strong cotton and linen rags were beaten by wooden stampers to form the pulp. In the latter part of the seventeenth century, Dutch papermakers developed a method of macerating the rags that utilized metal bars over metal or stone plates, resulting in shorter, lacerated fibers containing harmful metal fragments. A further setback came after chlorine was isolated in 1774. Papermakers soon realized that they could use the chemical for bleaching their rags. However, residuals of chlorine frequently were often left in the finished paper, resulting in the formation of hydrochloric acid.

Another damaging development was the increased use of alum-rosin as a sizing agent instead of gelatin. Although it had been used as early as the sixteenth century, the practice was not widespread until the 1800's, when papermakers discovered that they could add the alum-rosin sizing to the paper pulp instead of dipping each finished sheet into gelatin. Some kind of sizing is needed in order to reduce the absorbency of paper. Alum, however, which serves to keep the rosin particles in suspension, is actually aluminum potassium sulfate, and leaves a residue of acid-forming sulphur in the paper.

The next adverse influence on the life of paper also occurred during the nineteenth century; the "era of bad paper," in fact, is consid-

[44] Although it is not known what role Ts'ai Lun actually played in this discovery, other than reporting it, he is still considered the "patron saint" of paper-making. Indeed, an ancient Chinese scholar said about him, "Under the reign of Ho Ti, Ts'ai Lun, of Lei-Yang, conceived the idea of making paper from the bark of trees, discarded cloth, and hemp well prepared, the paper was then in use in the entire universe." (Dard Hunter, *Papermaking: The History and Technique of an Ancient Craft* (New York, Dover Publications, Inc., 1967) 50. Actually, knowledge of papermaking did not spread as rapidly as this statement would imply. The process was recognized immediately as being very valuable, and was kept a secret for many years—until, through infiltration of the court, trade caravans, and military conquest, it made its way first to the Middle East and, by the thirteenth century, to Italy, France, and Germany; from there it spread, by the middle of the fifteenth century, to England, Holland and Switzerland. Following Gutenberg's invention of the movable type printing press in 1452, the demand for the production of paper increased dramatically. Knowledge of the process continued to spread; in 1688 William Rittenhouse, who had been working in Germany and Holland as a craftsman in papermaking, came as an early settler to the state of Pennsylvania and set up work as the first papermaker in this country.

[45] Hunter p. 5.

ered to have begun around 1860. Due to ever increasing demands for paper and a shortage of cotton, groundwood, which was abundant and cheap, came into general use for producing paper pulp Groundwood contains a large percentage of lignin, a complex organic acid. If not purified, this acid accelerates the deterioration of paper. On the other hand, if the chemicals used to remove the lignin are not also removed, earlier deterioration occurs.

ATTACHMENT II

RECOMMENDATION OF GUIDELINES FOR A PUBLISHING SUBVENTION PROGRAM

Submitted to NHPRC 1 Sept. 77 by Samuel D. Stewart

Archival Permanence Standards (Paper, Printing and Binding)

A. Paper

The minimum standard for text paper used for titles subvened by the Commission has been based upon a guideline set by the Council on Library Resources resulting from research conducted by the now closed W.J. Barrow Research Laboratory of Richmond. Simply stated, this standard called for a paper with a minimum pH of 6.5, folding endurance of 150 folds at ½ kilogram tension and tear resistance of 1 gram per pound of basis weight

This standard is not adequate. A paper with a pH of 6 5 is still an acid paper (pH 7.0 is neutral) and will begin to self-destruct before reaching satisfactory archival longevity (200 years). A minimum pH of 7.5 (cold extraction, TAPPI method T-435) is recommended. Furthermore, a minimum alkaline reserve (calcium or magnesium carbonate or both) of 2%, based upon oven dry weight, should be provided in book text paper — this as a safeguard to counteract possible atmospheric pollution of the paper over the decades.

Since it is unlikely that titles subvened by the Commission will have anywhere near the average off-shelf referral of regular reference works, it is recommended that the tear resistance standard not be required and that a minimum C.D. (Cross Direction) folding endurance of 30 double folds at 1 kilogram tension (25 replicates, TAPPI method T-511) replace the old Barrow folding endurance standard.

There are a number of commercial papers that meet these standards and paper mills will provide the names of paper merchants handling small quantities of these papers.

These recommendations are based upon considerations of the laboratories of the National Archives, the Library of Congress and W.J. Barrow.

B. Printing

Inks generally used in printing books will not harm text paper. Inks which, for some reason, contain acids or chlorides should not be used in printing books subvened by the Commission.

The laboratories of the National Archives, the Library of Congress and the National Printing Ink Research Institute of Lehigh University were consulted on this matter

C. Binding

American publishers, as a rule, put strong bindings on expensive books. Books subvened by the Commission have not been exceptions. Durable boards, quality cloths, tough adhesives have been used. However, as with paper and ink, binding materials containing acids or chlorides constitute a danger to books requiring archival permanence. It has been found that many components in low-grade materials migrate to neutral papers stored in close contact.

Books subsidized by the Commission should be Smythe-sewn and casebound. It is recommended that all synthetic fabrics, pyroxylin finishes and polyvinyl chlorides not be used in binding these volumes. It is also recommended that these works have acid-free end papers (pH 7.5) with an alkaline reserve of 2% — this to act as a buffer against possible migration of acids in the board and cover materials of the case to the text paper.

These preceding recommendations are based upon discussions with the laboratories of the National Archives, the Library of Congress and the Council on Library Resources

Whether or not the jacket of a book should be considered part of its binding is moot. Sir Victor Gollancz, of the London publishing house bearing his name, may have been the only publisher in the last fifty years who really believed that the purpose of his plain-yellow-with-black-type wrappers was to keep the dust off his books. To-day, jackets are usually treated as advertising, as visuals to catch the eye of the browser in the bookstore. Whether they serve any purpose for documentary volumes is questionable. Before being put on library shelves, such books normally have their jackets removed. It is suggested that publishers of these books seriously consider bringing them out without jackets. The saving of a few hundred dollars on jackets might well be spent elsewhere in book production.

ATTACHMENT III

Intrinsic Value in Archival Material

Staff Information Paper 21

National Archives and Records Service, General Services Administration, Washington, 1982

Introduction

The term "intrinsic value" has long been used by archivists to describe historical materials that should be retained in their original form rather than as copies. In 1979 the term gained particular importance for the National Archives and Records Service (NARS) as it

began to consider possible large-scale replacement of paper records with miniaturized or other copies. To meet the challenge of distinguishing between records that need not be retained in their original form after an acceptable copy has been created and those that require preservation in the original, NARS established the Committee on Intrinsic Value. The Committee's work was three-fold: first, to write a comprehensive and broadly applicable definition of intrinsic value; second, to define the qualities and characteristics of records having intrinsic value; and third, to demonstrate application of the concept of intrinsic value in decisionmaking. The Committee completed a preliminary report in January 1980 and its final report in September of that year.

The Committee intended that its work should be useful for decisions relating to all physical types of records and manuscripts and should be relevant under varying and unforeseen circumstances. The Committee therefore sought first to establish the theoretical basis for the concept and then to be as specific as possible in identifying the qualities and characteristics of historical materials having intrinsic value. The Committee recognized that application of the concept of intrinsic value would be subjective and must always be dependent on trained archival judgment and professional debate.

Report of the Committee on Intrinsic Value

Intrinsic Value in Archival Materials

Intrinsic value is the archival term that is applied to permanently valuable records that have qualities and characteristics that make the records in their original physical form the only archivally acceptable form for preservation. Although all records in their original physical form have qualities and characteristics that would not be preserved in copies, records with intrinsic value have them to such a significant degree that the originals must be saved.

The qualities or characteristics that determine intrinsic value may be physical or intellectual; that is, they may relate to the physical base of the record and the means by which information is recorded on it or they may relate to the information contained in the record. Records with intrinsic value may be retained for either their evidential or informational value.

The archivist is responsible for determining which records have intrinsic value. Ordinarily this determination is made at the series level. As in all other archival appraisal activities, context is the key to making these determinations and context is normally best preserved by considering the entire series. The archivist, however, also may determine that certain individual record items within a series have intrinsic value, especially those items to be retained because of special physical characteristics.

Qualities and Characteristics of Records With Intrinsic Value

All record materials having intrinsic value possess one or more of the following specific qualities or characteristics. These qualities or characteristics relate to the physical nature of the records, their prospective uses, and the information they contain

1. *Physical form that may be the subject for study if the records provide meaningful documentation or significant examples of the form*

   Documents may be preserved in their original form as evidence of technological development. For example, a series of early press copies, glass-plate negatives, or wax-cylinder sound recordings may be retained. All records having a particular physical form would not be considered to have intrinsic value because of this characteristic; nowever, a selection broad enough to provide evidence of technological development would be considered to have some value.

2. *Aesthetic or artistic quality*

   Records having aesthetic or artistic quality may include photographs; pencil, ink, or watercolor sketches, maps; architectural drawings; frakturs; and engraved and/or printed forms, such as bounty-land warrants.

3. *Unique or curious physical features*

   Physical features that are unique or curious might include quality and texture of paper, color, wax seals, imprints and watermarks, inks, and unusual bindings. All records having a particular physical feature would not be considered to have intrinsic value because of this feature; however, an exemplary selection of each type would be considered to have such value.

4. *Age that provides a quality of uniqueness*

   Age is a relative rather than an absolute quality. Generally, records of earlier date are of more significance than records of later date. This can be because of a historical change in the functions and activities of the creator of the records, the scarcity of earlier records, a change in recordkeeping practices, or a combination of these. Age can be a factor even with comparatively recent records. The earliest records concerning, for example, the development of the radio industry or of nuclear power could have intrinsic value because of age.

5. *Value for use in exhibits*

   Records used frequently for exhibits normally have several qualities and characteristics that give them in-

trinsic value Records with exhibit value impressively convey the immediacy of an event, depict a significant issue, or impart a sense of the person who is the subject or originator of the record. In these cases, the impact of the original document cannot be equaled by a copy.

6. *Questionable authenticity, date, author, or other characteristic that is significant and ascertainable by physical examination*

Some records are of doubtful authenticity or have informational content that is open to question. Although it is impossible to foresee which documents will be questioned in the future, certain types of documents are well known to have the potential for controversy and, if the original records are extant, handwriting and signatures can be examined, paper age can be ascertained, and other physical tests can be performed. In some cases the controversy can be resolved by recourse to the original item (such as by an examination of the handwriting, the age of the paper, or the original negative of the photostatic print), while in other cases the item will not be conclusive but will provide the researcher with the best evidence from which to draw conclusions (original photographs of UFO's, for example).

7 *General and substantial public interest because of direct association with famous or historically significant people, places, things, issues, or events*

This criterion is not only the most difficult to apply, but also the most important in terms of the volume of records to which it could be applied. It could be used to justify preserving in original form almost all permanently valuable records because of their historical importance. On the other hand, if limited to records of unusual significance, it would be used to justify disposal of almost all original records. Archival judgment is the crucial factor in determining whether there is *general* and *substantial* public interest, whether the association is *direct*, and whether the subject is *famous* or *historically significant*. Generally, those series with a high concentration of such information should be preserved.

8. *Significance as documentation of the establishment or continuing legal basis of an agency or institution*

Agencies or institutions are founded and acquire or lose functions and responsibilities through the actions of the executive, legislative, and judicial branches of the Government Records documenting these actions may be found concentrated in series or scattered in various series. They have in common the characteristic of docu-

menting the shifts in function of the agency or institution at the highest level.

9. *Significance as documentation of the formulation of policy at the highest executive levels when the policy has significance and broad effect throughout or beyond the agency or institution*

   Numerous records reflect policy decisions, however, most policy decisions have a relatively limited impact and reflect a relatively small area of authority. The characteristics that give policy records intrinsic value are the origin of the records at the highest executive levels, breadth of effect, and importance of subject matter.

Application of the Concept of Intrinsic Value

Records that possess any characteristic or quality of intrinsic value should be retained in their original form if possible. The concept of intrinsic value, therefore, is not relative. However, *application* of the concept of intrinsic value is relative; opinions concerning whether records have intrinsic value may vary from archivist to archivist and from one generation of archivists to another. Professional archival judgment, therefore, must be exercised in all decisions concerning intrinsic value. Coordination between units holding records within an archival institution also may be necessary. For example, members of units holding similar records whose form may be the subject for study (quality 1) should consult one another to ensure that an adequate but not duplicative selection of records in that form is preserved. Although the concept of intrinsic value may be easier to apply to older records, decisions concerning intrinsic value can be made for all records determined to have sufficient value to warrant archival retention.

Copies of records having intrinsic value may be made for necessary archival purposes, including use by researchers. In fact, the fragility, rarity, or significance of the records may require that researchers normally work from reproductions.

Records that have intrinsic value should be considered for conservation or restoration; however, the determination that records have intrinsic value is only the first step in a decisionmaking continuum for preservation activities. Priorities and order of preservation activities should be guided by additional factors such as significance and frequency of use, rate of deterioration, seriousness of potential future preservation problems, and efficacy and expense of available treatments.

Although records with intrinsic value constitute the core of the holdings that archival institutions should maintain in original form, institutions also must retain records for which archivally acceptable copies cannot be made. This report does not attempt to establish comprehensive standards for archivally acceptable copies. At a minimum, however, such copies should have durability and utility for research use and for duplication equivalent to the records in their

original form. If adequate copies of such records cannot be made, originals lacking intrinsic value may not be considered for disposition For example, because, at present, reproductions made from duplicates of audiovisual records normally are of lower quality than reproductions made from the originals, most audiovisual records should be retained in their original form When copies with equivalent or superior quality can be produced from reproductions, the originals could be considered for disposal.

Some records without intrinsic value also must be preserved in original physical form because such preservation is required by law.

Following are three examples of the use of the concept of intrinsic value in the decisionmaking process as applied to particular series of records in the National Archives. In these examples, archivists first reviewed the series in accordance with the intrinsic value criteria. Second, if the records lacked intrinsic value, archivists then determined whether any statute required retention of the records in their original form. Finally, if the responses to the first two inquiries were negative, archivists examined the archival adequacy of the copies of the records. While archivists may not prepare formal papers such as those that follow, similar questions should be asked and answered for any proposed disposition of original records.

I. RG33, Records of the Federal Extension Service Farm Labor Program. Prison-of-War Program. 1943–46. 1 ft.

Arranged alphabetically by State.

Correspondence regarding the needs, placements, and status of prisoners of war employed in agriculture. The records reflect the relationship between the use of prisoner-of-war labor and migratory labor from Mexico and the Caribbean

A. Intrinsic value criteria

1. Example of physical form? No. These are records in the usual physical forms of mid-20th-century records
2. Aesthetic or artistic? No. These records are not visually interesting.
3. Unique or curious physical features? No. There are no three-dimensional materials or unusual bindings, seals, papers, or inks.
4. Age? No. These records are not unique in terms of age because there are many records from the World War II period, including records relating to POW's, among the permanent holdings.
5. Exhibit potential? Unlikely.
6. Authenticity? No. There are no doubts as to the authenticity of the records and no suggestion of forgery or other record tampering. There is no problem of signature or handwriting identification.

7. General public interest? No. Although the records reflect a significant issue in U.S. history (i.e., the treatment of POW's in World War II), the records are not used frequently, no significant persons are named in the records, and no significant events are recorded.
8. Legal basis of an agency or institution? No. These are records of implementation.
9. Policy at high level of Government? No. These are operating level records.

Conclusion: This series of records does not have intrinsic value.

B. Are these records covered by a statute requiring retention in original physical form? No.

C. Can adequate copies be created? Yes. The records do not vary in size, there are no problems of scale or color coding, and the ease of reference is not impaired by use of a reproduction. There is no privacy problem that would bar reproduction at this time.

Conclusion: The custodial unit can duplicate and request disposition of these records.

III. RG 49. Records of the Bureau of Land Management. Public Land Disposals. Abandoned Military Reservations. 1818–1945. 60 ft.

Arranged chronologically by date of initial disposition or activity on the reservation land.

Executive orders, correspondence, title papers, plats, maps, blueprints, tracings and printed items that document the General Land Office's role in the creation of military reservations from public lands and its responsibility for the disposal of reservations or portions of reservations abandoned by the War and Navy Departments. The records include information about goods and services available on the posts. Related records are found in other series of records of the General Land Office and among the general records of the Department of the Interior, the Office of the Chief of Engineers, the Office of the Quartermaster General, the Adjutant General's Office, United States Army commands, and the Office of the Judge Advocate General (Army).

A. Intrinsic value criteria

1. Example of physical form? No. These are routine types of records of the Government in the 19th and 20th centuries.
2. Aesthetic or artistic? Occasionally. The cartographic and architectural items are usually utilitarian, although some have artistic embellishments.
3. Unique or curious physical features? No. There are no three-dimensional materials or unusual bindings, seals, papers, or inks.

4. Age? The pre-Civil War records concerning military reservations in the United States are small in quantity in comparison to the records of post-Civil War periods. In these files, pre- and post-Civil War materials are interfiled.
5. Exhibit potential? Yes. These records could be used for exhibits on military posts, exploration of the West, organization of the frontier, surveying, land disposition, military organization, and even autographs (William Tecumseh Sherman, Joel Poinsett).
6. Authenticity? No problem.
7. General public interest? Yes. Many military historians and enthusiasts use these materials; the Council on Abandoned Military Posts is particularly interested.
8. Legal basis of an agency or institution? No. These are records of the implementation of land acquisition and disposition policy, not the records of the establishment of the basis for the policy.
9. Policy at high level of Government? No. Although the records do contain significant correspondence from the Secretaries of War and the Interior regarding the implementation of land disposition policy, this correspondence does not document the making of policy.

Conclusion: The records have intrinsic value.

III. RG 341, Records of Headquarters U.S. Air Force, Air Technical Intelligence Center, Wright-Patterson AFB, Ohio, Aerial Phenomena Branch. Three related series of audiovisual records composed of photographs (7,280), sound recordings (23), and motion pictures (20) from "Project Blue Book," 1950–67. 7,323 items.

Arranged by case number.

Audiovisual records in different formats created, acquired, or collected by the U.S. Air Force during its official investigation into the existence of unidentified flying objects (UFO's). There are photographs (35 mm negatives) of 21 alleged sightings of UFO's, including some photos recorded on roll film that show timed radar responses of the observed phenomena. The motion pictures (8 mm and 16 mm) are composed mainly of original camera footage (unedited) filmed by military personnel and civilians. The sound recordings were recorded or acquired by the Air Force and contain interviews with individuals claiming to have seen UFO's as well as sound recordings made at the time of the alleged sightings. Related textual records are in accompanying series of case files and project files of "Project Blue Book."

A. Intrinsic Value Criteria

1. Example of physical form? No. The forms represented are standard, common forms of audiovisual reproductions
2. Aesthetic or artistic value. No
3. Unique or curious physical features? No.
4. Age? No
5. Exhibit potential? Yes.
6. Authenticity? Yes. The entire phenomenon of the history of UFO's and the controversy surrounding their existence, as well as questions concerning the purpose and function of "Project Blue Book," require that the original records created or acquired by the Air Force and deposited with NARS be preserved and available for research scrutiny, testing and examination, and verification. This is especially a consideration because audiovisual documents are highly susceptible to tampering and manipulation. There is continued speculation and public doubt about the acequacy of the "evidence" and the conduct and conclusions of the official investigation.
7. General public interest? Yes. The history of UFO's, although a specialized research topic, does have a wide-ranging and emotional interest and fascination to the public.
8. Legal basis of agency or institution? No.
9. Policy at high level of Government? No. These are operating level records.

Conclusion. The records have intrinsic value.

Technology Assessment Report

Introduction

The National Archives and Records Service (which on April 1, 1985 will become the National Archives and Records Administration—NARA—as a result of legislation signed by President Reagan on October 19, 1984) is the repository of permanently valuable records and documentation of the activities of more than 500 agencies of the United States Government. Archivists appraise the records and documentation of these agencies in order to identify that small portion (usually less than 3 percent of the records and documentation created) of material deemed to merit permanent preservation because of the intrinsic value of the material itself or its informational content.

The actual physical arrangement of the records and documentation usually reflects the priorities and programs of the creating agency. As a result, in many instances the National Archives receives records and documentation in the form in which agencies created them, usually with little or no consideration given to the problems this may create for the National Archives in permanently retaining the records and documentation and facilitating public access to them. Consequently, the characteristics of the permanently valuable records in the National Archives, especially those created before 1950, vary widely. This is a major problem inasmuch as the holdings of the National Archives total approximately 1 2 million cubic feet (there are approximately 2600 pages per cubic foot).

Older records in the National Archives, especially those predating about 1900, constitute a major preservation problem because of the quality and condition of the paper involved. Many of these same records are handwritten in pencil or ink, and over the years the documents have become very difficult to read.

Of equal importance is public access to this rich documentation of our nation's heritage. Usually, public access (either by mail or in person) to these records requires the assistance of a trained archivist who is knowledgeable about the researcher's subject of interest. The National Archives has prepared a number of finding aids to specific bodies of records, but typically they are at such a general level of description that locating a specific record or document may involve working through a voluminous amount of material. For non-textual records—still pictures, motion pictures, sound recordings, and computer tapes—public access usually is at the item level, which means a specific picture, motion picture, sound recording, or computer tape. Except for computer tapes, this level of access is made possible because the agency creating the material found it useful to maintain this level of access usually through subject index cards. When the documents were transferred to the National Archives for permanent retention these index cards (or notebooks) of various

shades of color, weight of paper, and quality of type were also transferred.

The net result, therefore, is that there are many agency-generated finding aids which are absolutely essential to access to the records. Yet use of these finding aids frequently is very labor-intensive since it has never been practical to consolidate these index cards (or their equivalent) into a single integrated finding aid or retrieval vehicle for a sizable volume of our holdings. Compounding this labor-intensive activity is a substantial increase in requests from the public for copies of records in the National Archives, an increase which is unlikely to slow.

Exacerbating these preservation and public access problems is an increasing volume of paper-based documentation accompanying the growth of the Federal Government since the 1930s. The National Archives Building at 8th and Pennsylvania Avenue in Washington, DC, has space for about 900,000 cubic feet of records; yet the total holdings now are about 1.2 million cubic feet in nine Presidential Libraries and nine regional archives branches. Space is so critical in the National Archives that a moratorium on new accessions or transfers is in effect.

These preservation and public access problems and storage space constraints coincide with a government-wide interest in an effort to achieve increased productivity, which together create an extraordinary opportunity for the National Archives to explore alternative solutions. One obvious approach is to examine automation and relevant new technologies and integrate them into a systematic and comprehensive solution that addresses all of these problems. In this approach, a major question is how to get the holdings of the National Archives, most of which are in paper form, into a form which can be processed by a computer. The focus of this study, therefore, is an examination of conversion technologies which will translate textual or document image material into computer processible form.

There are four known ways to convert a document image to a digital format: key stroking by a data entry operator; voice or speech pattern recognition; optical character recognition; and raster scanning. Key stroking is analogous to typing since it consists of typing or entering information into a data base, and will not be considered further in this report. Voice or speech pattern recognition is a technology that permits a user to enter data into a computer data base or to give oral instructions to a computer. Optical character recognition (OCR) automatically enters information into a computer data base by "reading" printed or typed characters and translating them into digital character codes. A raster scan is an application of digital facsimile transmission technology in which a page image is captured and converted into a digital code that can be displayed as a visual image. The essential difference between optical character recognition and raster scanning is that the latter manipulates images only as visual items and cannot interpret text or numbers and process their content.

This study begins with a detailed review of the problems the National Archives faces in considering the use of any conversion technology. Following this analysis is a description and assessment of voice pattern recognition, optical character recognition and digital raster scanning, based upon the problems previously reviewed. Each section of this report draws upon extensive research into the appropriate literature, reviews of current applications both within and outside of the Federal Government, contacts with vendors, and, except for voice recognition, actual test runs using a particular technology to convert a selected body of archival material into a computer-processible form. At the conclusion of each assessment is a set of recommendations for the National Archives. Rounding out this study is a list of sources for additional information.

Although this report focuses upon the needs and problems of the National Archives, it has significant implications for a much broader archival community as well as agencies and institutions—both public and private—that create records and documentation which contribute to the documentary heritage of America. Of course, the solutions this report recommends for implementation in the National Archives are not necessarily the appropriate solutions for other archives and creators of records and documentation. Nevertheless, it is hoped that a wide audience will find this report useful in identifying the technology or technologies which will work best in different settings.

Conversion, Storage, and Retrieval Requirements

Physical Characteristics

The holdings of the National Archives, most of which consist of paper-based documentation, extend from the 1770s to the present. The physical characteristics of this documentation, which vary enormously over time, define a basic set of parameters directly affecting the conversion of this documentation to an electronic storage form. In addition, some of this documentation—no more than 25 percent—is intrinsically valuable and must be retained in its original form, even if an acceptable copy is made. The remainder is valuable because of its informational content and need not be retained in its original form.

It is difficult to describe with exact precision the physical characteristics of the holdings of the National Archives which are measured in cubic feet and typically are arranged in series, the physical volume of which can range widely. Consequently, any percentages and numbers must be taken as "best guesses" which a very long and detailed survey might alter considerably. Despite this caveat, these statistics do provide a "working framework" that is useful in addressing document preparation problems as part of a document conversion system.

Type of Paper

Approximately 80 percent of the holdings consist of loose, unbound pieces of paper. Bound volumes comprise about 15 percent and the remainder, somewhere near 2.5 percent, is index cards. The most common paper form is letter or legal size, although smaller paper is frequently encountered. Of greater significance, about 25 percent of the paper is larger than legal size paper. Unlike loose, unbound paper records, index cards usually are found together as finding aids or they are not used at all.

Book or writing paper is the most common type of paper, although tissue paper, handmade paper, parchment, and newsprint also are present. In contrast, tissue paper probably accounts for less than 3 percent of the total volume, with newsprint, handmade paper, and parchment representing a negligible amount.

Typed or Handwritten

Handwritten and typed material in about equal amounts comprise about 75 percent of the holdings with the remainder consisting of printed material. Not unexpectedly, most of the handwritten material dates back to the late 18th and early 19th centuries. Printed text makes up about 22 percent of the holdings with press copies comprising the remaining 2–3 percent. Press copies of correspondence, which are usually bound, typically consist of sheets of tissue paper with the text on the backside, which is read through the paper.

Color of Ink

A particularly important aspect of the physical characteristics of the holdings of the National Archives is the presence of colored ink or pencil notations. Although black ink or pencil predominates, as much as 75 percent of the holdings also may have colored ink or pencil notations. Of course, for that portion of the documentation that is of intrinsic value all colors must be captured in a conversion project. For documentation of informational value, colors of ink or pencil are significant in only about 9 percent of the holdings and would have to be captured and retained when converted.

Contrast and General Conditions

Of equal importance in an archival conversion project are the contrast and general condition of the paper. Low contrast or a faint image characterizes about 10 percent of the documentation, although in some portions, especially those dating back to the late 18th and early 19th centuries, this percentage is substantially higher. For example, in the collection of service records predating the second world war about 42 percent have light ink or low contrast. However, probably less than 5 percent of the holdings suffer from major damage such as tearing or breaking. Of greater consequence for the document preparation phase of a conversion project is the fact that almost one-half of the records include folded material and about 30 percent of this is brittle....

These physical characteristics help define the parameters of a conversion project. However, some of these physical characteristics are dynamic and the simple passage of time will exacerbate some of the problems described above. A conversion project begun ten or twenty years from now will face more problems and difficulties.

Administrative Concerns

A major administrative concern, which a comprehensive conversion strategy must address, is how to complete the project as rapidly as possible, given the sheer volume of the undertaking. Throughput conversion rates, therefore, are important in a soundly planned and managed conversion project. Careful attention must be given to the document preparation phase and alternatives for accelerating the entire process must be examined. One way to do the latter would be to presort documents into batches of similar size and condition and set up enough job streams with work stations to maintain a throughput rate of, say, 1,000 pages per hour per workstation. However, even with the use of five conversion workstations, simple mathematics show that the conversion phase alone would take almost five weeks to process one million pages. At this rate it would take between 30 and 40 years to complete just the conversion process itself, not counting document preparation, indexing, and quality control.

A related concern is the potential damage to documents that may result from mechanical feeding units. Fragile documents, especially tissue or carbon paper ones, probably would be torn and shredded if standard paper transport feeds are used. One possible solution would be to place these fragile documents in mylar jackets for protection. Limited experimentation has shown that use of mylar jackets does not affect the conversion itself by altering the reflectivity of light. However, enclosure of documents in mylar jackets would increase the amount of time required in document preparation.

System errors, which are defined as the failure to properly identify each piece of paper for accurate retrieval purposes or the failure to obtain a satisfactory conversion output product, must be held to an absolute minimum. A conversion project involving a substantial portion of the holdings of the National Archives is too important and costly to do more than one time. Consequently, careful attention must be devoted to building into the system design safeguards that minimize the occurrence of system errors. Quality control procedures must be designed and rigorously adhered to.

Enhancement

A sizable portion of the paper holdings of the National Archives is in reasonably good condition and probably would require no improvement in the document image in the conversion process. However, this is not true for many records, especially where the contrast is low or there is other damage that would result in the loss of information during conversion. A general rule to follow in a conversion is that the copy should be at least as good as the original. However, where deterioration may have made all or portions of the original

practically illegible, some improvement would be very desirable. Enhancement of the original image, especially where 18th and 19th century documents are concerned, therefore is a major consideration in defining the conversion, storage, and retrieval requirements of the National Archives.

Storage and Retrieval

Storage

A major consideration for examining conversion technology alternatives for the National Archives is that of significantly reducing the physical volume of permanently valuable records that the National Archives retains. As noted, the Archives Building at 8th and Pennsylvania Avenue, which has a storage capacity of about 900,000 cubic feet of records, is now filled to capacity. Short of relocating the National Archives, or acquiring additional buildings to increase stack space, the only long term solution is to identify storage technologies which can achieve a significant reduction in the need for storage space in the present and the future.

Closely related to the need for physical reduction of space to house the holdings of the National Archives is the potential need for a faster and more efficient distributed public access to the holdings. Currently, public access to records in the National Archives is limited to telephone calls, direct mail requests, or in-person visits to the National Archives. It is quite likely that the trend in distributed information bases and decentralized access to these information bases will carry over into increased public expectations for easier access to archival records. It is important, therefore, that the design of a conversion project ensures that there will be no major technological impediments when this kind of access is set in place.

Permanence, of course, also is inextricably related to storage requirements of the National Archives since the holdings are of permanent value. Traditionally, permanence for the National Archives has meant stability and the absence of deterioration in paper or microform documentation. Certain implications of using new technologies, especially those related to computers, in creating records gradually will modify this traditional definition of permanence. Increasingly, the issue will be technological obsolescence rather than permanence of the storage media, especially if recopying electronically stored records is both fast and inexpensive. A key requirement for a conversion project is to require that conversion equipment and operational equipment have upward migration capability. If this criterion is satisfied, it should be relatively easy and cost-effective to acquire and maintain equipment that bridges technological generations

Retrieval

The rationale for the National Archives to store permanently valuable records is to ensure their future accessibility. Ensuring preservation of records without also ensuring timely access to them makes

no sense. Consequently, retrieval concerns and issues must be addressed at the same time that archival storage concerns and issues are addressed. The design of a retrieval system should be included in the system design for a conversion project. Such a system should be as user-friendly as possible so that it is easy to use and requires little training. Although on-line direct access may not be economically feasible in the immediate future, the retrieval system should permit very timely access, say, no more than 10 to 15 minutes. This retrieval capability also should include visual inspection on a video display unit and hardcopy output in either paper or microform....

Voice Recognition Technology

The concept of having a machine automatically recognize human speech, convert it into computer processible form, and then display this on a screen or print it out is straightforward and relatively easy to comprehend.... The key components in such a conversion technology are an input unit for receiving the human speech and converting it into an audio signal (analog), a device to convert this audio signal into a digital representation, a unit to compare this digital representation with another set of digital representations in a vocabulary stored in a computer, and a unit to convey all of this information to a user....

Applications

Despite the announcement of prototype advanced voice recognition systems by IBM and the Kurzweil Artificial Intelligence Company, most of the voice recognition systems applications really are quite limited and primitive. Several manufacturers of microcomputers now are offering a voice recognition capability in which the system is trained to recognize a user's voice. For example, Texas Instruments offers several such packages with an on-line recognition vocabulary of between 50 and 75 words. A major vendor of software for the IBM personal computer plans to market a plug-in card that will give voice recognition capability to the IBM XT and IBM-compatible personal computers.

Probably the most interesting work in voice recognition applications involves potential users of voice recognition capability rather than hardware manufacturers or software vendors. Although there are a number of research/development projects now underway, attention will be directed to a project of the U.S. Postal Service.

A study which was completed in December of 1983, summarizes the conclusions derived from a set of experiments to use automatic voice recognition technology in sorting bulk mail. This study suggests that automatic speech recognition has a limited potential application in sorting bulk mail. Although the study lists several reasons that are peculiar to the U.S. Postal Service, several conclusions have wider ramifications. The most important conclusion in this regard is that it is just as accurate and fast for an operator to enter a zip code into a numeric keyboard as to enter this zip code using automatic speech recognition. The study identifies some

application guidelines that are pertinent to many potential applications of automatic speech recognition technology.

Despite the claims of proponents of automatic speech recognition technology, it is not a mature technology in that it cannot replace human speech recognition capability. A great deal of research work into the nature of human speech communication in a variety of environments must be done before this technology can be considered useful to archives.

Assessment

Automatic speech recognition technology has a very limited potential application in the National Archives, especially as a tool for converting the information content of documents to a computer processible form. Even when automatic speech recognition technology is viewed as having a potential application in indexing or assigning unique identifiers to documents, the experience of the U.S. Postal Service is instructive. Keyboard entry of digits is more accurate and as fast as automatic speech recognition devices. Indeed, in most instances the only justification for using automatic speech recognition devices is when an operator has to use both hands in handling bulky mail.

Recommendations

Despite the immediate limited potential for application of automatic speech recognition technology in the National Archives, it is a technology which will grow and become far more robust. Consequently, it is important that the National Archives acquire first hand experience in working with automatic speech recognition technology devices in order to identify the archival needs that an automatic speech recognition system must meet. To this end, therefore, we recommend that one or two pilot projects be initiated to identify the parameters within which the National Archives might effectively use automatic speech recognition technology at some point in the future. In addition we recommend that the National Archives support projects that monitor developments in this technology. . . .

Optical Character Recognition

A typical OCR system has three major functions: detection, recognition, and output. Detection consists of optical devices which "see" a particular black pattern on a document and determine if it is a character, a mark, or a bar code. Interpreting this black pattern in terms of being a specific character is the recognition function. Output of interpreted characters can include on-line use in a word processing activity, storage on magnetic tape for later analysis, and type setting for publication purposes, among others.

Although movement of documents through an optical reader is important and contributes significantly to the speed and reliability of a system, the most critical activity is recognition since it directly affects both the speed and accuracy of the system. In general, the rate of correct character recognition is directly proportional to the

quality of the document being scanned. Recognition problems generally result from imperfectly formed characters that are the product of bad ribbons, bent keys, misaligned characters, and esoteric or non-standard type fonts.

Applications

Today there are more than thirty companies that manufacture a variety of optical character recognition equipment. Most OCR equipment is limited to reading a limited number of type fonts that typically include OCR-A, OCR-B and output from Selectric typewriters and Daisywheel printers.... Two companies, Kurzweil Computer Products and Recognition Equipment Incorporated, claim there are no limitations on the number of type fonts their equipment can read.

Most OCR equipment being marketed in 1984 has a throughput rate of between 85 and 150 characters per second. Such OCR readers automatically adjust to changes in spacing of characters, find and scan lines of characters regardless of where they begin or end, and accept selected type fonts with no human intervention required. Some OCR readers also automatically adjust to paper color and contrast between ink and the paper, although this tends to increase substantially the cost for such readers.

Although there is a wide range of OCR applications, virtually all of them are related to activities associated with billing, paying accounts, and sorting mail. Banks are a heavy user of OCR readers to process checks. Perhaps the one business application that receives the heaviest use involves credit card billings.

OCR readers are available that can read as many as 2,400 credit card bills per minute. One very interesting application involves Medicare billings in which printed forms use a red ink that cannot be read by an infrared light source. The information that is to be read and converted to a computer processible form is encoded using a carbon base (black) ink that is read by an infrared light source. The Internal Revenue Service is experimenting with the use of printed tax forms in which red or pink ink is used. If the tax information is recorded with a carbon base ink, then an OCR reader would pick up only this information.

One reason why high throughput rates are possible in most OCR applications is that the paper or card stock is not fragile and therefore would not be chewed up by the belts and drives in the mechanical transport. Equally important is the fact that usually there is not a great deal of data on a credit card charge that has to be converted to a computer processible form.

Vendors of OCR equipment generally view business offices as the next major application area, especially where there is a need to increase productivity and eliminate paperwork bottlenecks resulting from an increased work volume. The cost of manually keying (typewriter or data entry terminal) data has doubled since 1960. An advanced OCR reader can input the equivalent of about 300 pages an hour while a good typist can produce about six to ten pages per hour. Also, the most advanced OCR readers have established error rates

(where an incorrect character is substituted for a correct legible character) of one in 300,000 characters while a very skillful typist usually has an error rate of about one in 3,000 characters.

Assessment

The critical question for archives, of course, is how well OCR technology can be used in an archival and/or records management setting. An assessment of the potential use the National Archives might derive from OCR applications must take into consideration the following issues: (1) Is the throughput rate, after correction for a realistic error rate, high enough? (2) Can the document transport handle a wide variety of different sizes and weights of paper? (3) Is the actual character interpretation or recognition capability sufficient to handle a wide variety of type fonts? (4) Does low resolution or contrast significantly affect the "read error rate? (5) Do irregularly shaped characters (usually resulting from uneven key stroke pressure, a soft platen, worn key face characters, or reading from a carbon or a ditto copy) create special problems? (6) Do non-carbon inks and color paper stock require special modification?

The speed with which OCR devices can read a document varies between 85 and 150 characters per second, with the higher read rate dramatically increasing the cost of the equipment. A typical typewritten page that is double spaced contains about 1,250 characters. Thus, the read rate could range from 14 seconds to about 8 seconds per 8½ by 11 inch page. Of course, if smaller documents with fewer characters are read the throughput rate per document will be higher. The key factor remains the number of characters read per second.

Exhibits 3.2.e and 3.2.f display electrostatic copies of two typical index cards from the subject access finding aids of the Still Pictures Branch and the subject access finding aids of the Modern Military Headquarters Branch of the National Archives. Exhibit 3.2.d is an index card in French to the *New York Times* in the 1930s. If these index cards were in machine-readable form, it would be possible to have a computer translate the French into English on a word by word basis and then sort the English translation into alphabetic order. Exhibit 3.2.e is an item level finding aid to FBI intelligence reports the Office of Strategic Services received during World War II. These particular index cards are quite interesting because the card stock is salmon color. Exhibit 3.2.f is a series level finding aid to negatives, photographs, and lantern slides dealing with aviation history between 1909 and 1927.

The number of characters in Exhibits 3.2.d and 3.2.e is fairly close, 288 and 224 characters respectively. Exhibit 3.2.f has 896 characters. Thus, the raw or uncorrected throughput rate would be approximately 3.3 seconds, 2.6 seconds, and 10 seconds respectively. However, it is necessary to adjust a raw throughput rate for operator intervention to correct a character which the system has flagged as questionable. In the best situation it is reasonable to assume that each error correction will require at least 1 second.

INDEX CARD TO NEW YORK TIMES

EXHIBIT
3.2.d.

QUEEN ELIZABETH (Paquebot Anglais)

UN GEANT DES MERS BIENTOT PRET POUR LE GRAND VOYAGE...
843E. - A Clydebank, le transatlantique géant "Queen Elizabeth" soeur de "Quenn Mary" dont les derniers aménagements sont en cours d' achèvement et qui prendra bientât la mer pour le grand voyage inaugural vers le nouveau Monde.

Londres I5.8.39

INDEX CARD TO
OSS RECORDS

EXHIBIT
3.2.e.

9815 R | REFERENCE CARD | 1.22

COMMUNISM, ARGENTINA

Activities in Cordoba, Argentina. Report includes information on newspapers (those mentioned print pro-Allied propaganda). axis activity, Communist activity, and pro-allied activity. FBI. 12/30/41.

COI-0060

INDEX CARD TO STILL PICTURES

EXHIBIT
3.2.1.

18-AH Location: 1943 3 24 Dr 1, 2

LANTERN SLIDES: Aviation History, c. 1903-1927

Description: Lantern slides derived from, among others, Signal Corps negatives, Air Service negatives, and Dayton negatives (18-WP), covering all phases of aviation, including the Wright Brothers' flight at Kitty Hawk, the Alaska Flight of 1920, bombing of the USS Alabama and the Ostfriedland, aerial photographs of US and foreign cities, US and foreign aircraft, airships and balloons, engines and other aircraft components, and such personalities as Glenn Martin, Douglass Campbell, Thomas A. Edison, Billy Mitchell and Eddie Rickenbacker.

Arrangement: Numerical by lantern slide number (A set of duplicates is arranged by subject)

Finding Aids: Published Air Service Information Circular Vol. V, No. 469 (June 1924) "Catalogue of Motion Picture Films and Lantern Slides," in stack also shelf list (Series AHS)

Restrictions: None

Numbering System: RG, Series, item

Items: c. 2200 Container: 2 RD Cuft: 2.5
Linft: 31.7 ft

Transaction: 2920 (OVER)

OCR CONVERTED INDEX CARD TO NEW YORK TIMES

EXHIBIT
3.2.g.

QUEEN ELIZABETH (Paquebot Anglais)

UN GEANT DES MERS BIENTOT PRET POUR LE GRAND VOYAGE..
BAIE. - A Clydebank, le transatlantique géant "Queen Elizabeth" soeur de "Queenn Mary" dont les derniers aménagements sont en cours d'achèvement et qui prendra bientôt la mer pour le grand voyage inaugural vers le nouveau Monde.

Londres I.M.

EXHIBIT 3.2.h.

[redacted]815 [redacted] REFERENCE CARD [redacted] 1.[redacted]

CC[redacted]ISM, ARGENTINA

Activities in Cordoba, Argentina. Report includes information on newspapers (those mentioned print pro-Allied propaganda). axis activity, Com[redacted]unist activity, and pro-allied activity. FBI. 1[redacted]/[redacted]0/41.

COI.0060

OCR CONVERTED INDEX CARD TO STILL PICTURES

EXHIBIT
3.2.1.

18-AH Location 19[illegible] 3 2[illegible] Dr 1, [illegible]

L[illegible]RN SLIDES. Aviation History, c. 190[illegible]-1927

Description: Lantern slides derived from, among others, Signal Corps negatives, Air Service negatives, and Dayton negatives (18-[illegible]), [illegible] phases of aviation, including the Wright Brothers' flight at Kitty Hawk, the Alaska Flight of 1920, bombing of the USS Ala[illegible] and the Ostfriedlan[illegible], aerial photographs of US and foreign [illegible], US and fo[illegible]ign aircraft, airships and balloons, engines and [illegible] aircraft components, and such personalities as Glenn Mar[illegible]tin, Douglass Campbell, Thomas A. Edison, Billy Mitchell and Eddie Rickenbacker.

Arrangement: Numerical by lantern slide number (A set of duplicates [illegible] by subject)

Finding Aids: Published Air Service Information Circular Vol. V, No. [illegible]69 (June 1924), "Catalogue of Motion Picture Films and Lantern Slides," in stacks.

Restrictions: None also shelf list (Series AHS[illegible]

Numbering System: RG, Series, item

Items: c. 2200 Container 2 RD CuFt: 2.5

Transaction. 2920 (OVER) LinFt: 31.7 ft

Exhibits 3.2.g, 3.2.h and 3.2.i show the OCR output (pixel matrix matching) resulting from reading each of the index cards in the above exhibits. In Exhibit 3.2.g there are 14 errors which are indicated by X and an underline. The index card with the largest number of characters to read—Exhibit 3.2.i—has only 22 errors. Although the flagged error rates, which range from 6 percent to less than 1 percent, are acceptable, this must be offset by the amount of operator intervention required to make corrections. Thus, the corrected throughput rate for each index card is 17 seconds, 16 seconds, and 31 seconds, respectively. During the course of a normal work day one person probably could read and correct between 1,000 and 1,400 cards. This seems quite low and suggests that OCR technology probably should be used only to convert item level finding aids with many index cards which are awkward to use in their present arrangement.

With few exceptions, document transports in OCR readers generally consist of belts and wheels which tend to bend and mutilate the heavy stock of index cards. The document transports of some OCR readers can be adjusted to handle different size documents, with the smallest size being 3 x 5 index cards. Some item level finding aids in the National Archives are on tissue paper or otherwise might be quite fragile and would require special handling in order to avoid any damage. One possible solution would be to place index cards in a mylar jacket or envelope and simply pass this envelope through the OCR reader. Although this is theoretically possible, no document transport system currently available can handle the additional thickness of the mylar jacket. It is clear that special modifications to the document transport in OCR readers will be necessary before applications of OCR technology can be seriously considered for archives. As noted earlier, many of the index cards or item level finding aids in the National Archives were created before the National Archives had been established or before archivists were generally aware of how crucial the difference in type fonts is in using OCR technology. It is estimated that there are more than 200 different type fonts that have been used at one time or another and doubtless most public archives have typed material that is in one of the older type fonts. This is a major problem for archives and probably will be corrected only as vendors recognize that OCR technology has severe limitations when brought to bear upon documents in the archives. It is encouraging to note that at least three vendors of OCR equipment already have recognized this as a problem and have developed software or hardware that they believe will make this a trivial problem. Only actual benchmark tests will demonstrate the validity of these claims and the National Archives should support benchmark tests of the capability of OCR readers to handle a wide range of type fonts, either through further software development or the use of artificial intelligence.

Low resolution, which may result from a number of causes, is a serious impediment to the use of OCR technology. Many index cards

from item level finding aids in the National Archives have very faint images, generally resulting either from a worn out typewriter ribbon or the color and condition of the paper stock on which the finding aid material is recorded. For example, one set of index cards is blue stock and the ink also is blue. This, of course, makes it very difficult for an OCR device to identify characters from background material when there is insufficient variation in the reflectivity of lines being read. Traditional OCR technology can deal with this in part with the use of filters on the reading lens. Another solution is to make an electrostatic copy of the original index cards with the copier set for a dark image and use the electrostatic copy as input to the OCR unit. This, of course, means the index cards are handled twice and greatly increases the cost of OCR conversion to the point that it might be more cost-effective to re-key the data rather than use an OCR reader.

A far more flexible approach is the integration of raster scanning (p. 153) with OCR so that the enhancement capability of raster scanning can be used to improve significantly the resolution or contrast between the ink and paper stock. This enhanced document image could then be passed to an OCR device, which employs either matrix matching or feature analysis, to convert each character to a digital signal. The integration of these two technologies has important implications for both NARS and the larger archival community. The National Archives should support programs that will demonstrate the utility of this integration for converting index cards with low resolution problems. Irregularly shaped characters, along with underlining that touches characters, probably present the most formidable challenge to OCR applications in the National Archives. Many of the item level finding aids the National Archives has received from Federal agencies were prepared on manual typewriters and both the ribbon and the key head characters had been used so much that the typed characters frequently have soft, fuzzy edges that make it very difficult for the matrix matching or feature analysis to yield results with a high level of confidence. Problems with soft and fuzzy edges or lines of characters are compounded when the National Archives has only a carbon copy or a ditto copy, as is true in a number of series, particularly military records.

Equally as troublesome are the interpretation problems for OCR devices when adjacent characters touch at some point or a character is out of alignment. Of course, the human eye sees these points of contact, but the brain automatically compensates for this by resolving the ambiguity based upon stored knowledge about the likelihood of certain characters appearing in this context and makes the correct character interpretation. An OCR device literally sees and interprets only unambiguous characters on a page or an index card for which it has a pixel matrix or feature analysis matrix. Therefore, if two adjacent characters "touch" at any point, the pixel matrix or feature analysis matrix matching process described earlier will result in flagging the two characters as unreadable or errors. Error flagging also will occur when a character is not aligned with adjacent characters.

The consequences of "touching characters" and "characters not aligned" are clearly illustrated in a comparison of the flagged errors in Exhibit 3.2.i. with the original index card in Exhibit 3.2.f. The first flagged error is in the first line at the top left of the card. There is no ambiguity to the human eye: the line reads as "18 AH." However, the OCR reader flagged the "8" as unreadable. A careful inspection of the "8" in the original index card (this is less apparent in the electrostatic copy) suggests that another character was typed, erased, and the correct number was typed. The erasure did not remove all of the ink of the typo which then became part of the "8." The next flagged error relating to an irregularly shaped character is in the same line and is preceded by a "2 " The entry on the original index card is a "24." Note, however, that the "4" descends well below the "2" and this probably caused the error.

The next flagged error is in the next line at the left margin. The human eye interprets this as "LANTERN" but the OCR reader flagged the "ANTE" as unreadable. A careful inspection of these letters on the original index card reveals that the bottom of the "A" touches the bottom of the ' N", the top of the "N" touches the top of the "T", and the top of the "T" touches the top of the "E". A similar situation occurs in the second line of the description where the word "SerX ce" appears. The "v ' and the "i" touch on the original index card. It is likely that even a very advanced form of artificial intelligence, which is not available with any OCR readers available today or in the near future would have marginal success in correctly interpreting these "touching characters.

Another example of an irregularly shaped character flagged as an error is in the word *"Description:"* at the left margin of the index card. Note that the X is not underlined here because an underline is used in the text. And it is the underline which probably caused this error. The descender of the "p" extends into the underline and results in a pixel matrix for which the OCR reader has no matching pixel matrix. This explanation also probably accounts for the "g" in "Finding" being flagged as an error. There appears to be no known solution to the problem of underlining which touches one or more characters.

Although several other flagged errors probably can be attributed to typos which have been erased and typed over or carbon ribbon smudges, there are no ready explanations for the remaining flagged errors or the characters incorrectly read. For example the "n" in "Ostfriedland" is read as an "r" and "Campbell" is read as "CamPbell." The OCR reader simply misinterpreted these characters.

Closely related to problems of irregularly shaped characters is the inability of most OCR devices to read material that is produced with a non-carbon ink. Manufacturers of OCR equipment tend to use an infrared light source because it is a way to read printed forms in which selected information is desired. This means, however, that non-carbon based inks in the red and yellow range are relatively insensitive to infrared light waves. Consequently, material that is typed or printed with a non-carbon based red or yellow ink will not

be read. Although most of the item level finding aids in the National Archives were produced on manual typewriters with a black ribbon, there are some important exceptions when a red ribbon was used. Conventional OCR readers therefore, would treat characters formed with a non-carbon based red or yellow ink as blank space because there would be no light reflectivity to measure. This is illustrated in Exhibit 3.2.i. The OCR output does not include the horizontal line at the top of the original card in Exhibit 3.2.f. because on the original card the line is red. Interestingly, the color of paper stock even when it is in the red color band seems to make little difference in light reflectivity.

Recommendations

It seems clear that conversion of typed item level finding aids, printed indexes to archival material, and similar material to a machine-readable form could be a significant application of OCR technology in the National Archives. Therefore, the National Archives should conduct a study of item level finding aids in the National Archives in order to determine the volume of such material, including kinds of type fonts, and identify those finding aids which offer both the most potential for increased productivity of NARS staff and easier access by the public. Using this information base, the National Archives should set up several pilot projects to identify type fonts typically used in the item level finding aids and determine which specific OCR equipment can handle these type fonts. In addition, the National Archives should conduct several studies comparing the cost-effectiveness of using off-the-shelf OCR equipment to convert several small bodies of item level finding aid material into machine-readable form vis-a-vis the cost-effectiveness of having the same information keyed in. Since some of the archival material that OCR technology could convert to machine-readable form is fragile and irregular in size, the National Archives should encourage OCR vendors to offer optional mechanical transport equipment that will handle mylar jackets. Finally, the National Archives should encourage vendors to continue their efforts to merge OCR technology and raster scanning technology into a single integrated technology.

Digital Image Conversion

The modern video disc era began, of course, between 1972 and 1975 when several large companies committed major capital resources to developing a marketable laser disc recording product. N.V. Philips (Netherlands) demonstrated a system of laser recording of a master disc and playback using laser sensing. MCA (USA) demonstrated a similar system known as "Discovision." The two companies later joined forces. Other companies involved in the early days of video disc development included Zenith, I/O Metrics (USA), Thomson/CSF (France), and RCA (USA). Appendix A identifies addi-

tional companies that are involved in this and related digital optical technology.

Accompanying this revived interest in video disc technology was the development of what is generally called optical digital disk storage technology. Unlike video disc technology, which uses an analog signal that is better suited to home entertainment, marketing, and training activities, optical digital disk storage technology uses digital codes required for computer processing of data and facsimile images. Digital image technology using optical disks for storage offers the potential for reducing some of the information handling problems resulting from the "electronic information age."

Document Preparation

Few image conversion applications projects are likely to have similar sized documents in good condition with the characteristics that make them good candidates for conversion. As a result, provisions must be made for a system that takes into consideration the odd document: the document that will not easily fit into the mold created by the requirements of the majority of the document population. Several logical steps present themselves in the analysis of the document preparation process.

The first step should be to identify key characteristics of the document holdings; that is, to learn their population size, physical characteristics, their filing logic, their throughput processing requirements and their primary and secondary importance. For example, physical characteristic questions can take various forms. Do the documents have folds? Are pages normally stapled together? Should the staples be removed? How important is file integrity? Can damaged or fragile documents be placed in a protective sleeve? What effect will ragged edges have on document handling and processing? This is just a small sample of some of the types of information that must be obtained and analyzed. . . .

The document preparation component must also include considerations for document indexing. An original document may not show the kind of information required for a particular indexing scheme. Perhaps, the system will utilize an electronic device that will automatically pick up index information such as a numeric, alpha or combination alphanumeric code. In this case, the correct code must be affixed to the document, a cover sheet, or protective sleeve. (Note: If the code is not affixed directly to the document there is a risk that the document will become separated from its index information.) Of course, manual indexing systems exist where the operator will key in some information taken from the body of the document. This is a very tedious and slow process. New techniques utilizing sophisticated counting algorithms are being developed. These, however, are really only useful in limited situations that have standardized input documents.

In most cases, the universe of documents to be converted is dissimilar in terms of size, color, weight of the paper, and the like.

Presorting documents in batches with shared characteristics will enable scanners and other system components to use constant settings resulting in the gain of valuable throughput. Also, there is value in presorting the most heavily accessed documents into their own batch (as long as original order integrity is maintained). By identifying this group, rapid retrieval could be gained through on-line storage. Documents with a lower access rate could be stored on lower cost off-line devices.

Since document preparation is a very labor-intensive activity, it can be one of the most expensive components of a major system. In addition, it has a major impact on the capacity of a system to achieve a high throughput rate. Efficiency of document preparation, therefore, must be a major aspect of a document conversion system. It is highly labor-intensive, cumbersome, and ties up system throughput. Positive cost benefit ratios may depend upon the efficiency of the document preparation phase of a system.

Scanning

Once documents pass through the preparation stage, they are ready for input into the system.... The first step of the input subsystem is the scanning process, which is briefly introduced and then covered in more detail in a later section.

The scanning process is a method used to convert the image on a paper document into a computer code. Once the image is in code it can be enhanced, stored, and retrieved more efficiently. The prepared, original documents are fed into a scanner (much like feeding a photocopy machine) where they are scanned by one of three different types of devices: a cathode ray tube (CRT) scanner, a charged coupled device (CCD) scanner, or a laser scanner. Of these, laser scanners are the most recent addition; however, CCD scanners are most commonly used....

Indexing

Any system designed to retrieve selected images requires some sort of indexing subsystem. In its simplest configuration, an indexing scheme would facilitate the locating of known document files. In other words, knowing the file identification number permits a researcher to key this code into a terminal. The indexing software automatically points to the location of the images and then retrieves them. In every type of index subsystem the image must be identified with a unique code. Depending on the existing method of indexing being used and the desired detailed level of the requested item, individual page images or groups of images must be associated with this unique code or identification number. This identification (ID) number must be united with the image at the point of image conversion (scan) in order to safeguard against losing images. Capturing the ID number is possible by several different means. An original document may already have an ID code on it. This code might be read by using Optical Character Recognition (OCR) technology (See OCR section).

If the code cannot be input into the computer automatically, the code can be keyed in using a keyboard or spoken, using speech pattern recognition (see speech recognition section). In a few cases, sequential numeric codes corresponding to each document can be generated directly by the input system software as the document is scanned (similar to counting pages). Indexing schemes using subject search techniques are also available and are being utilized more extensively.

Quality Control

Once the document is scanned and its index code entered, the results must be reviewed. The electronic image of the document can be brought up on an image data terminal (IDT) and compared against the original paper document for legibility and quality of scan. The index code must be verified as the correct code for that particular image. If the index code is incorrect after it is released from quality control the document image will be "lost" in the system forever. The chances of ever locating the image are very remote. The importance of the quality control process cannot be stressed enough.

Storage

The original document has now been scanned and its image has been converted into a digital bit stream. This electronic image has been indexed and verified. It must now be stored in order to save the image and to make it easily retrievable ...

Digital data can be stored magnetically or optically. Both techniques utilize different storage media such as rotating disk, tape, and imprinted card. This discussion will focus on the disk, since it is the form most commonly used for on-line access. ..

The primary difference between magnetic and optical media is the technology used to record the information on the disk....

Seemingly so similar, there are particular advantages and disadvantages to each....

- Data can be stored on optical disk much more compactly than on magnetic disks. As much as one hundred times more data can be stored on similarly sized disks.
- Magnetic disks have the capability to write over existing data on the disk. This erasable feature is not yet commercially available on optical disks.

Since the original image cannot be modified, nonerasability appears to make optical disks a particularly attractive technology for archival applications....

Since large image data bases require huge amounts of storage space, optical disks offer a relatively low cost storage and retrieval alternative. Nevertheless, the image data base must be structured in order to limit the highest cost storage and to create the most efficient and cost effective system possible. This can be easily accomplished with a hierarchical approach, that is, transfer images from higher

cost, immediate access storage to lower cost storage with slower access rates. Lower cost storage can be used depending on the predicted frequency of retrieval requests. Each storage device has an optimal usage pattern. When used in combination, they form an efficient image storage hierarchy.

Magnetic disks are very efficient for storing smaller amounts of dynamic data which are frequently updated. However, magnetic disks must be recopied to another disk periodically in order to maintain the data. It is for these reasons that magnetic disks are the medium of choice for transient storage as a buffer in the input and output cycles. Data can reside there for several days until used and then new data can be written over it. Magnetic disks are often used as the medium to carry index information. This information is alphanumeric and requires relatively little space (compared to image data). It is updated quite often and should, therefore, be erasable. Optical disks are most suited to longer term image data storage due to its longer life (ten years at present), its capacity for automated retrieval (jukebox), and its current lack of erasability.

Usually, the documents most recently created or modified account for the greatest number of document requests. In any case, identification of the type of documents most requested will enable the system designers to limit instant access storage in the hierarchy to the type of documents with the highest frequency of requests. It may be preferable to use short term magnetic disk storage or permanently mounted optical disk storage for their speed of access. The vast majority of document holdings also require access; however, the allowed time between the request and the retrieval can be longer since the frequency of their request is less. Off line or jukebox storage can be used in these instances. Access to a document image located in a large jukebox typically takes up to 15 seconds. Optical disks may be off line and loaded manually. Generally, the faster and easier the access, the more it costs.

Output

The conversion of the original documents into an electronic digital code, which has been indexed, enhanced, compressed and stored on a very high density storage medium would be of no benefit without being able to regain the original document image once again in a human readable form. The speed and method of retrieval are extremely important in the design of the output end of the system. The type of output required is also prominent in the system scheme.

Output can take several forms depending on what the requirements are and how the system is configured. The type of indexing subsystems used is integral to the output subsystem requirements. If the index points directly to an individual page image and the requester is confident of the choice, a hard copy print may be the preferred output medium. The index scheme may limit access capability to the file or other document set, in which case the requester is more likely to want to peruse a portion of the file or a range of

selected document images. In this case, a soft copy video display would provide adequate research capability. After selections have been made, hard copy prints can be produced Output can also take the form of computer output microform (COM) as microfiche or roll film.

A simple retrieval subsystem would enable a requester to go to a terminal, key in some index code retrieve the requested document image in hard or soft copy, and transmit the image to a terminal in another location.

Image Conversion

Paper documents are cumbersome to stor[illegible] handle The image on the page usually does not easily convert to computer interpretable data. There may be a need to retain a facsimile image of the original. The most efficient way to store, retrieve, and transport the image of a document is to convert it to an electronic signal. This section will describe the most commonly used methods for this conversion.

What does it mean to take a piece of paper with an image of something on it and end up with a digital computer code that can be reconverted back into an exact duplicate of the original? The process begins with the prepared document going through a device called a scanner. This scanner processes a page of paper in from .5 seconds to more than 30 seconds (depending on the paper input and the type of scanner). The image of the page is picked up by electronic sensor mechanisms that convert the image to an electronic code. This code can be indexed, stored and retrieved much like any computer data....

Consideradons — Document Characteristics

Some document types fit the optimum mold for electronic conversion. Documents with black printing or some other black marking conibined with a white background ofter very good contrast between the background and the surface information. Unfortunately, input documents do not always fit this optimum configuration. For this reason, scanning hardware and software must be designed either for the majority document type or be able to accept multiple types by using manual or automatic techniques to change input parameters. These parameters involve such methods as thresholding, scan density modification, and data compression. Document characteristics that a simple conversion system does not handle well include: severe discoloration due to damage, printing over a background image, odd sized documents, and extremely small sized image details. Color does not seem to make much difference except in cases where the colors are in low contrast to one another or they contain information that would be lost without their color distinctions. Examples of these would be a document with red letters on a pink background and a document with color coded information.

These problems can usually be overcome in a scanner and its image software; however, it presents a good opportunity to use a sys-

tem design strategy to determine what type of input configuration is chosen for a particular application. Typically, the less done to the electronic image of a document, the faster the throughput and the less costly the hardware. In a large application where throughput is imperative, multiple scanner types may be in order. Regular scanners would handle the standard sized, black and white, business documents along with similar sized, good contrast, simple graphic documents. Input documents could be stack fed into high speed automatic document transports. Since very little enhancement and manipulation would be required, high throughput rates could be achieved. Documents requiring special handling because of poor contrast, minute image detail, or odd size could be pre-sorted and scanned on devices particularly suited to these problems. Therefore, an input system designed for a large application would have several different scanners and related image software. . . .

This description of some of the techniques of digital image technology can be highlighted with several examples from test runs conducted during the summer of 1984 involving a selected body of archival material. These examples are described in a narrative rather than with illustrations since electrostatic reproduction employs limited enhancement that might create a misleading appearance. In addition, reproduction of converted copies in this report might tend to create the impression that the equipment of one particular vendor is being recommended. Three examples of the conversion of original archival documents (more than 30 were actually used in test conversions) are offered in order to convey such results in terms familiar to archivists and other non-technically oriented persons.

The first example is a land bounty certificate (1850) from the Office of Pensions. The certificate is on parchment stock with blue and black ink and is in excellent condition. Also, it has a blue background along with several engraved illustrations. Because of the various shades of blue ink and the background illustrations, the document was scanned at 200 lines per inch with a density of 8 bits per pixel. The latter, of course, involved a gray scale which contributed greatly to enhancing several aspects of the art work which were more evident in the copy than the original. Because this particular document was read using a gray scale and a resolution of 200 lines per inch, it was possible to use a "zoom" capability on the display device to gain even greater detail. This particular example suggests that in some instances, say for documents of intrinsic value, the use of a 8 bit gray scale may be very advantageous.

The second example involves a letter written in 1859 in which the paper stock is bluish-gray and the ink is black. The writer wrote on both sides of the paper; and over a period of time, it has become very difficult to read because the ink on the reverse side has bled through and obscured the handwriting on the front. This document was scanned several times with different instrument settings. For instance, when an 8 bit gray scale at a resolution of 200 lines per inch was used, the difference in the darkness of the ink on the reverse side became more apparent. The use of the "zoom" capability made it

possible to clearly distinguish each letter. In another instance, a document was scanned at several different thresholds and densities, and through the optimum combination of these two, the difference in dark ink (front side of page) and light ink (back side of page) was increased. The net result was an image more readable than the original.

The final example deals with a document dated 1875 in which the paper stock was white and had handwritten information in what appeared to be pencil, and typed or printed in red and black ink. The paper itself was torn and brittle and required very special handling. As a result of tears, faded ink and pencil, and brown color of the paper (because of high acid content of the paper, no doubt), portions of the document were almost impossible to read. Any electrostatic copy simply exacerbated illegibility, especially where tears and folds were concerned. After the image was raster scanned and enhanced, all of these problems were minimized. An on-line edit capability was used to "erase" all of the dark spots associated with tears and folds. The enhancement capability increased the contrast of a poor image so that it was more legible. Although the final screen image represented a significant improvement over the original document, it was short of perfection. However, it was significantly more readable than the original.

Raster Scanning Image Conversion Assessment

As A Technology

In order to assess digital imaging scanning as a technology, its relative worth, as well as its advancement, must be considered. As mentioned earlier, the concept of converting graphic images into electronic signals and then reconstructing them is not a new one. The technology, it seems, has reached the point where the theory is now practice. Digital raster scanning still has some rough edges; however, with heavy industry competition, the technology should mature at an accelerated pace.

The most important aspect of digital image capture is the idea of converting a graphic image on a piece of paper to an electronic signal. Once that is completed, the paper and its associated problems of storage, conservation, or retrieval need not be a concern again. There is an entire industry that has sprung up over the last five years dedicated to digital imaging. Hundreds of millions of dollars are being poured into its development. With this type of participation between members of the industry, more technological breakthroughs are likely in the near future that will only serve to expand the capabilities of the technology.

Several characteristics of digital image techology should be reiterated. Transportability is perhaps the most important. Once the image is in digital form, standard computer data handling practices can be used. The image can be stored on a computer storage me-

dium. It can be sent down a wire, or even past a satellite, to some remote location. It can be moved from one storage medium to another without loss of generation. It can be duplicated and used in several locations simultaneously. Moreover, since future storage media and computer technologies will likely use bits of digital data as their language, conversion of current paper holdings to a digital electronic signal will ensure future compatibility without the necessity of reconversion of the paper document in the future. Electronic storage of a document would allow for standard computer security access techniques. Document image files could be secure with access allowed only with proper clearance codes. Virtual instant access to any electronically stored digital image could be accomplished. Both storage space and cost per page, relative to paper storage, would be reduced to a negligible amount. Preservation of the paper would no longer be a problem.

The archival life of optical media, such as optical disk, has been a question mainly due to its relatively young existence. Even though most media manufacturers guarantee (based upon accelerated life testing) a life of ten years, the question really becomes one of economics. Since the electronic image is digital in format, it can be copied to a new disk or other medium if it begins to deteriorate. The deterioration occurs at a relatively slow rate and is easy to detect early. It becomes an economic matter if the cost of recopying becomes prohibitive. At this point, it appears that both the media cost and copying time are currently low enough (and going down) to eliminate this economic factor. As a result, with proper recopying the question of archival life may be a moot issue.

As An Application For The National Archives

Even though there are many document types in the vast holdings of the National Archives, they can be generally divided into documents that are intrinsically valuable and those that are valuable because of the worth of their informational content alone. Therefore, by definition, intrinsically valuable documents in National Archives' holdings are excluded from this discussion. However, documents having only informational value make up the vast majority of the holdings and should be retained in the most efficient method possible.

The above discussion of digital raster image conversion describes a technology that has the capability of performing the functions required to create an efficient information storage and retrieval system. Simply acquiring components that perform tasks does not necessarily solve existing problems; indeed, more problems may be created. Clearly, the technology exists in a form that could prove most useful to the National Archives. There are, however, many detailed considerations that must be researched before the National Archives should commit itself to any such system. The best way to obtain the answers required is to conduct a type of in-house research pilot test. Research could be completed into important areas such as: the ex-

tent of document preparation required, throughput requirements, the type of indexing scheme most useful, the extent of quality control necessary, the percentage of holdings stored on-line, response time required on retrieval, the form of output (video, paper, film etc.), and remote data transmission. Each of these areas and others represent significant system components that could make or break a successful system. Even though each of the components exist for such a system, the actual integrated system must be installed in the production setting in order to accurately answer these questions. The capabilities of integrated systems, based on digital image raster conversion, are great and are sure to have the ability to be configured in such a way as to provide the optimum benefit for an application for the National Archives.

Appendix III

Additional Information

A. Significant Legislation and Regulations Affecting Government Records
B. Selected Surveys and Studies of Government Records
C. Elements of a Comprehensive Government Records Program
D. Principles for State Archival and Records Management Agencies
E. National Archives and Records Service Appraisal Guidelines
F. Examples of Federal Government Records Schedules

Map cases in the Cartographic and Architectural Branch, National Archives

Appendix III-A

Significant Legislation, Regulations, and Directives Affecting Government Records

1789	Federal "housekeeping" statute	Authorized federal agencies to set up filing systems and keep records
1881		First action by Congress to authorize disposal of federal records, extended only to Post Office Department
1881		First bill to establish federal "hall of records" introduced and passed by Senate; failed in House
1899		Disposal authority extended by Congress to other executive agencies, lists of records proposed for destruction had to be submitted to and approved by Congress
1901		Alabama Dept. of Archives and History established, the first agency to serve in any state as the official custodian of the state's archives
1913		Congress authorized preparation of plans for a national archives building
1914	Executive Order 1499 (Wilson)	Agency requests to dispose of records had to be submitted to Librarian of Congress for approval before going to Congress for action

1934	National Archives Act of 1934	Established National Archives with authority to administer records of all three branches of government included power to inspect all records, requisition transfer of records, creation of NHPC, power to establish regulations for arrangement, custody, use, and withdrawal of deposited material, annual report to Congress on recommended disposals
1939	Proposed Uniform State Public Records Act	
1940	Executive Order 8381 (Roosevelt)	Established security classifications for documents in Depts. of War and Navy
1942	Federal Reports Act of 1942	
1943	Records Disposal Act of 1943	Authorized use of general records schedules
1944	Proposed Model Act to create a State Dept. of Archives & History	
1946	Administrative Procedures Act Section 3	
1946	Executive Order 9784 (Truman)	Directed each federal agency to develop an active records management program. Bureau of the Budget to conduct inspections and issue regulations re: orderly disposal of unnecessary records with advice and assistance of National Archives
1947	Model Bill for a State Archives Dept.	
1949	Federal Property and Administrative Services Act of 1949	Transferred National Archives to the newly created General Services Administration (GSA)

1949	General Services Administration (Order 27)	Created National Archives and Records Service
1950	Federal Records Act of 1950	Repealed National Archives Act of 1934, as amended. Placed almost all archival and records management authority with GSA administrator; reconstituted NHPC; abolished National Archives Council replacing it with Federal Records Council to include (for first time) a judicial branch representative
1951	Executive Order 10290 (Truman)	Extended security classification system to nonmilitary agencies; established procedures for reviewing, declassifying, downgrading security classified information
1953	Executive Order 10501 (Eisenhower)	Entitled "Safeguarding Official Information in the Interests of the Defense of the U.S." Served until 1972 as the basis for the security classification system
1956	Amendment to Federal Records Act	Limited agency and security restrictions on access to 50 years except when specifically allowed by law
1957	Amendment to Federal Records Act	NARS authorized to effect removal of any enduringly valuable federal records more than 50 years old unless agency head certified that the records had to be retained for current business
1959	Executive Order 10816 (Eisenhower)	Allowed private researchers to be considered for access to security classified information

1965	Presidential Order	Moratorium on purchase of new filing equipment
1966	Freedom of Information Act (effective July 4, 1967)	
1970		Congress no longer required submission of disposal lists and schedules for its approval except for records of "special interest"
1972	Executive Order 11652 (Nixon)	Called for mandatory review of security classified records
1974	Privacy Act of 1974	
1974	Amendment to Freedom of Information Act	
1976	Amendment to Federal Records Act	
1976	Georgia Privacy Act	First state to authorize access to any record in archives after 75 years
1978	Amendment to Federal Records Act	
1978	Presidential Records Act (effective 1/20/81)	Presidential papers, traditionally owned by presidents, declared to be government records. Established provisions for transfer to NARS/GSA and for access to documents.
1979	Executive Order 12174 (Carter)	Established procedures to eliminate all unnecessary paperwork burdens imposed by federal government on the public, businesses, and state and local governments
1980	Paperwork Reduction Act of 1980 (effective April 1, 1981)	

1982	Executive Order 12356	Established system for all executive agencies to follow when classifying, handling, and declassifying National Security Information. ISOO responsible for overseeing compliance by agencies
1984	National Archives and Records Administration Act of 1984	Re-established the National Archives as an independent agency. Archivist of the U.S. to be appointed by the president with the advice and consent of the Senate.

Appendix III-B

SELECTED STUDIES AND SURVEYS OF GOVERNMENT RECORDS, 1899–Present

Dates of Study	Sponsor(s)	Scope/Purpose of Study	Associated Products/Publications	Results
1899–1904	American Historical Association, Public Archives Commission			Advocacy for legislation brought several state archives into existence and, ultimately, the National Archives
1935–1942	Historical Records Survey (WPA)	Prepare inventories of county, state, and federal records nationwide	Published inventories: 506 vols. of federal records 628 vols. of county records	

1947–1949	Commission on the Organization of the Executive Branch of Government (Hoover Commission)	Establish a task force on records management to recommend policies for the control of federal records	Emmett J Leahy, *Records Management in the United States Government* (January 1949)	Federal Property and Administrative Service Act of 1949 (PL 81-152) effective 7/1/49 which transferred the National Archives to the newly created GSA. Federal Records Act of 1950 placed records management authority in GSA and required agencies to establish records management programs.
1954–1955	Second Hoover Commission	To seek additional methods for controlling the creation of federal records and storing them more efficiently.		
1962–1963	Society of American Archivists (with funds from the Council on Library Resources)	Study and describe public archives in the 50 states and the territories, analyze strengths and weaknesses of each program.	Ernst Posner, *American State Archives* (1964)	

SELECTED STUDIES AND SURVEYS OF GOVERNMENT RECORDS, 1899–Present (Continued)

Dates of Study	Sponsor(s)	Scope/Purpose of Study	Associated Products/Publications	Results
1967	Joint Committee on the Status of the National Archives	Study NARS and its historical development, particularly whether it should be an independent agency	H. G. Jones, *Records of a Nation* (1969)	
1973	U.S. Department of Health, Education and Welfare		*Records, Computers, and the Rights of Citizens* (1973)	Privacy Act of 1974
1975–1977	Commission on Federal Paperwork		A series of reports, including *Records Management in the Agencies, Information Resources Management, Federal Paperwork and State and Local Governments*	Paperwork Reduction Act of 1980 (effective April 1, 1981)

	National Study Commission on Records and Documents of Federal Officials	To determine the status of presidential papers. (Created by Presidential Recordings and Materials Act largely in response to the dispute over ownership of Nixon White House records.)	Committee Report, Microfiche of studies, transcripts, reports (NARS), Nelson, ed., *The Records of Federal Officials* (1978)	Presidential Records Act, 1978 All records of Presidents taking office on or after 1/20/81 are federal records
1978	Private Research	History of the National Archives, 1934–1968	Donald R. McCoy, *The National Archives* (1978)	
1979–1980	American Association for State and Local History (with funds from NHPRC)	Study of local government records	H. G. Jones, *Local Government Records* (1980)	
1981–To Date	National Historical Publications and Records Commission	Funds allocated to Historical Records Advisory Boards in 23 states to assess and report on conditions of state and local records, government records, private collections, and statewide needs for preserving historical records and manuscripts. An additional 17 states received funding in 1983.	Assessment reports prepared and distributed by more than 20 states in 1983. Reports from other states are in preparation.	

Appendix III-C

Elements of a Comprehensive Government Records Program

While specific alignments and program elements vary from jurisdiction to jurisdiction, the overall scope of a comprehensive government records program as the concept has developed over the last several decades would include the following elements:

Archival program

The operation of a central repository for the permanently valuable records of all three branches of government. Records are transferred to the archives after active use by the originating agency ceases. The professional archivist arranges, describes, and preserves the records, and provides reference service to other government agencies and the public. The archives also might provide other services, such as exhibitions, educational programs, and publications.

Records center operation

The operation of a centralized storage facility for semi-current records designed to house a large volume of records inexpensively. The guiding principle is to remove infrequently used records from expensive office space into cheaper warehouse-type storage. Only physical custody of the material is transferred; legal ownership remains with the transferring agency. Material transferred to records centers is often limited to non-permanent records that are used occasionally or rarely but must be kept for a specific time to meet a legal requirement (e.g., audit, statute of limitations). Centers are staffed by professional and paraprofessional archival employees who provide reference service to government agencies as well as clerical personnel who handle routine filing duties.

Appraisal and scheduling

The determination of how long a record should be kept and when it should be destroyed or transferred from the agency of origin to a records center or archives, as appropriate. Agencies usually draft their own retention schedules, in consultation with the archives/records management agency, listing each record type and proposing a retention period for it. The schedules are then reviewed by the archives/records management staff who appraise their archival value and make recommendations to the official(s) having authority to approve the schedule (usually the chief archivist and/or the records

board or commission). Even when the chief archivist does not have authority to approve the schedule, he/she may have the right to review it and designate records as permanent, asking for their eventual transfer to the archives.

Micrographics

The use of micrographics to reduce the volume of paper-based files and to ensure preservation of information contained in fragile records. Frequently a centralized micrographics staff provides services to other agencies on a cost-recovery basis. The central staff may also be responsible for inspecting microforms produced by other agencies or contractors to ensure compliance with prescribed standards.

Management of current records

The development and implementation of procedures to improve the efficiency and economy of records creation and handling in the agencies. Training and guidance is often provided by a central staff to the agency records officers responsible for specific programs. Areas of concentration have included the improvement of filing systems, mail handling, directive issuances, forms design, report preparation and correspondence management.

Information systems design

Technical advice on the installation of word processing, micrographics, and ADP systems for handling information. Designing an effective computer-based system is often just a logical extension of devising a sound filing system for paper records. Ideally, the same people who are trained to set up efficient retrieval strategies for paper files should be implementing similar systems for automated records. The agency records officers should work closely with the ADP staff to make certain old and new information retrieval techniques are compatible.

Appendix III-D

Principles for State Archival and Records Management Agencies

The principles adopted by the National Association of State Archives and Records Management Administrators, for State archives and records management agencies are based upon the premise that government records, unlike documentary materials which emanate from private sources, have a unique character that imposes special responsibilities on the agencies that preserve and manage them. These principles are not intended to deny the value of non-governmental source materials as an important part of our heritage, nor are they intended to place untenable sanctions on those State agencies that do, by statute, policy or necessity, collect and preserve private manuscripts and other non-official material. The principles do require that we recognize the fundamental importance of government records within the society which is controlled and served by that government.

We acknowledge that government is the most important institution in any society: That its power to control and regulate citizens: to compel their obedience within its boundaries; and to protect and care for them renders it in its sovereign power unequalled by any alternative organization within society. Government is the one institution that in one way or another, at one time or another, touches the lives of every single individual within its jurisdiction. It not only affects the lives of all citizens, but inherent in that contact between government and citizen is a complex interdependence of rights and obligations, of mutual responsibility and accountability. While its outward form and characteristics may change, government itself exists in perpetuity. The records of this most fundamental of human institutions therefore partake of a fundamentality of their own in respect to it. Such records must be maintained, managed, preserved, and when appropriate, disposed of according to principles that recognize their unique status.

We have no difficulty in respecting this unique status when we are applying such pure methodology of our profession as ordering, arranging and describing government records, or when we establish disposition schedules that take into account legal statutes of limitations or restriction. If, however, government records have indeed the fundamental characteristics which have been described, then it follows that the agencies that administer professional programs for the

records must themselves have a placement and a status within government that has a central relationship with its operations.

Successful records management programs in the various States have tended to enjoy such a placement within the structure of the overall governments they serve. On the other hand, and all too frequently, State archival programs have been separated and segregated away from any responsible relationship with the rest of government, and have been relegated to preserving and administering as historical relics those records which are thought to have no further intrinsic value as *government* records. The results of this are pernicious: Underfunded, understaffed, underequipped operations that are subjected to the priorities of some other professional undertaking—the library, the museum—or of some highly political or ruthlessly pragmatic bureau. It has resulted in the alienation or loss of records; it has prevented the substantive growth and development of the profession, and it has brought many of us to the marginal edge of survival. These results have come about with our tacit consent.

Because our training and our interests bring us very close to the historian, the librarian, and the manuscript curator, some find it very difficult to distinguish our exclusive responsibilities from theirs or, indeed, to see that there is any difference at all. But there is a difference; and it is not a matter of preference, choice or emphasis. The administration of government records imposes an obligation upon us that is not shared by the seemingly related disciplines and professions.

The principles are designed to make these unique distinctions very clear. They do not conflict with nor do they disserve the interdisciplinary considerations that inure to the many informational uses to which government records may be put. They do attempt to focus our attention and our commitment towards an identity and positive role that can only strengthen our profession, our institutions, and the quality of our service to both the government and the people.

Statement of Principles

The following principles were adopted by The National Association of State Archives and Records Administrators on July 22, 1977 at its annual meeting in St. Louis, Missouri to assist the several States in the establishment and operation of State archival and records management agencies:

I
Legislation

Comprehensive legislation which recognizes the fundamental nature of the relationship of government records as instruments of accountability by the government to the people, evidence of public and private rights and obligations an informational source on matters involving the continuous administration and management of the government; preserves the patrimony of the State as evidenced

in its records; and provides exclusive authority to carry out archives and records management functions and responsibilities on a government-wide basis.

II
Institutional Identity

The institutional character of the agency as the repository of the permanently valuable records of the government to provide sufficient autonomy for its protection against political interference including tenure for the agency head, civil service protection for its personnel, and control of agency facilities, equipment and resources.

III
Organizational Placement

Placement within the government that prevents the submersion of the agency beneath competing interests; eliminates blurring of functions with other professional agencies and disciplines; protects against interference with agency program responsibilities under the color of coordination authority; and eliminates hampering supervision and control by those having little or no professional knowledge of its program responsibilities and operations.

IV
Program Authority

Sufficient authority for the agency to define records problems and needs of the State, to prescribe appropriate programs, and to effectively administer the programs.

V
Exclusive Responsibility

Exclusive program responsibilities that do not diffuse the primary responsibility of the agency for government records.

VI
Appropriation and Expenditure

Funding by direct appropriation to the agency by the Legislature with authority to budget and expend such funds.

VII
Internal Policy

Exclusive agency determination of the internal policies and professional needs of the agency.

VIII
Regulations and Standards

Power to prescibe and enforce rules, regulations and standards relating to government records administration

Appendix III-E

NARS Appraisal Guidelines

From: *Disposition of Federal Records*. General Services Administration, National Archives and Records Service 1983.

TABLE 4—PERMANENT RECORDS APPRAISAL GUIDELINES

The generic series descriptions listed below illustrate the types of records normally appraised for permanent retention by NARS. Because of the wide variety of records created in the Federal Government and the complex nature of the appraisal process, this list cannot detail every type of series that may be appraised for retention. In addition, the list applies only to current records whose life cycle has been carefully controlled. Somewhat different standards apply to records created in earlier periods of our history when the maintenance and disposition of Federal records were not as closely regulated. Because many important 19th-century records were inadvertently destroyed by fire, flood, and general neglect, routine administrative and housekeeping records are often preserved for this period to show the functions of the Federal Government.

1. General Subject Files Documenting Substantive Agency Programs

Correspondence with other Federal agencies, Members of Congress and congressional committees, the Executive Office of the President, the President, private organizations and individuals, internal agency memorandums, narrative and statistical reports, budget estimates and justifications, and a variety of other records concerning all substantive and distinctive programs of the agency. These series represent the basic system of records documenting the evolution of major policies and procedures and are frequently designated for permanent retention when created at the following levels: secretary; undersecretary; deputy secretary; assistant secretary; administrators, chairpersons commissioners, and directors of administrations, bureaus, and services within a department; and heads of independent Federal agencies and their chief assistants. When the agency's important programs are not documented in program correspondence maintained at these higher levels, similar records created at lower levels must be designated for preservation The number of series selected from a given agency will depend on the degree of duplication evidenced by comparisons among files created at the various administrative levels. Where substantial duplication does exist, the file created at the highest level will be chosen. Where little or no duplication exists, series at all levels will be taken and in some cases at levels lower than those indicated above.

2. Selected Case Files

Many Federal records are created in the form of case files. These records may include correspondence, memorandums, periodic narrative reports, and similar materials which relate to a specific action, event, person, place, project, or other subject and provide complete documentation of an agency's activities from initiation to conclusion. Although most case file series are disposable at some future date, a complete set occasionally may be designated for permanent retention, particularly when the files have been captured in machine-readable form. More frequently, however, only a portion of a case file series is selected for transfer to the National Archives. Those chosen normally fall under one or more of the following categories. The case:

a. Established a precedent and therefore resulted in a major policy or procedural change;
b. Was involved in extensive litigation;
c. Received widespread attention from the news media;
d. Was widely recognized for its uniqueness by established authorities outside the Government;
e. Was reviewed at length in the agency's annual report to the Congress; or
f. Was selected to document agency procedures rather than to capture information relating to the subject of the individual file.

Categories a through e establish the exceptional nature of a particular case file while category f relates to routine files chosen because they exemplify the policies and procedures of the creating agency. The types of case files selected for permanent retention under the criteria established above include, but are not limited to, research grants awarded for studies; research and development projects; investigative, enforcement, and litigation case files; social service and welfare case files; labor relations case files; case files related to the development of natural resources and the preservation of historic studies; public works case files; and Federal court case files.

3. Analytical Reports

Analytical research studies and periodic reports prepared by the agency or by a private organization or individual under contract to the agency or in receipt of a grant from the agency. Studies and reports selected for permanent retention may be statistical, narrative, machine-readable or audiovisual in nature. Regional reports prepared by field offices and forwarded to the agency's headquarters are frequently selected because they contain information relating to ethnic, social, economic, or other aspects of specific geographical locations. Excluded from selection are studies and reports which are published and therefore widely available in public libraries, as well as recurring periodic reports which are summarized on an annual basis. (See item 13 for publications permanently retained.) In some

instances, only selected studies and reports are maintained for future research.

4. Formal Minutes of Boards and Commissions

Minutes of meetings of boards and commissions of Federal agencies documenting substantive policy and procedural decisions. Frequently, the executive direction of a Federal agency is provided by a board or commission rather than by a single appointed individual. Typically, these agencies are regulatory bodies such as the Federal Trade Commission, but also include organizations such as the Pension Benefit Guaranty Corporation and the Commission of Fine Arts. Minutes may be literal transcriptions or edited summaries. Sound recordings of these meetings should also be preserved.

5. Records of Internal Agency, Interagency, and Non-Federal Committees

Minutes, agenda, proposals submitted for review, and final recommendations of meetings of ad hoc committees as well as more formally established councils, conferences (e.g., White House Conferences), and task forces attended by senior agency officers. These meetings may be limited to internal agency personnel or may include representatives from other Federal agencies or even non-Federal groups. Records selected for permanent retention to document interagency meetings will be limited to the agency designated as the group's secretariat. The minutes selected may be summary in nature, verbatim transcripts, or audio or video recordings.

6. Legal Opinions and Comments on Legislation

Memorandums prepared by an agency's legal counsel or program officers concerning interpretations of existing laws and regulations or the effects of proposed laws and regulations which govern the agency or which have a direct effect on its operations. Records selected under this item concern the agency's primary missions and normally exclude general opinions and comments relating to other Federal agencies. Included are formal comments on pending legislation prepared at the request of the Congress or the Office of Management and Budget. Most of these records are permanent when created in the offices of general counsels of departments and independent agencies. Excluded are copies of bills, hearings, and statutes held for convenient reference. Similar records maintained below the departmental level may not be archival depending on their content and relationship with records of the departmental counsel.

7. Evaluations of Internal Operations

Studies conducted to determine the effectiveness of the procedures adopted to achieve established policy goals. These may include evaluations of both program and administrative operations and may be made by the agency itself (inspectors general) or by

outside oversight agencies (General Accounting Office). Only those studies which recommend significant changes in policy or procedural violations are preserved. In addition, a complete record set of studies prepared by oversight agencies are designated for preservation in the creating agency. All other copies are disposable.

8. Formal Directives, Procedural Issuances, and Operating Manuals

Formal directives distributed as orders, circulars, or in loose-leaf manual form announcing major changes in the agency's policies and procedures. Normally these are issued with the authority of the head of the agency. Extensive procedures are frequently detailed in lengthy operating manuals.

9. Records on Functional Organization

a. Organizational charts and reorganization studies. Graphic illustrations which provide a detailed description of the arrangement and administrative structure of the functional units of a agency. Reorganization studies are conducted to design an efficient organizational framework most suited to carrying out the agency's programs and include materials such as final recommendations, proposals, and staff evaluations. These files also contain administrative maps that show regional boundaries and headquarters of decentralized agencies or that show the geographic extent or limits of an agency's programs and projects.

b. Functional statements. Formally prepared descriptions of the responsibilities assigned to the senior executive officers of an agency at the division level and above. If the functional statements are printed in the Code of Federal Regulations, they are not designated for preservation as a separate series.

10. Briefing Materials

Statistical and narrative reports and other summary materials prepared for b fings of recently appointed heads of agencies and their senior advisors to inform them of the current status of the agency. In addition, briefing books are occasionally prepared to inform an agency head of the current status of a major issue confronting the agency or in preparation for hearings, press conferences, major addresses.

11. Public Relations Records

a. Speeches, addresses, and comments. Remarks made at formal ceremonies and during interviews by heads of agencies or their senior assistants concerning the programs of their agencies. The speeches and addresses may be presented to executives from other Federal agencies, representatives of State and local governments, or private groups, such as college and university students, business associations, and cultural organizations. Interviews may be granted

to radio, television, or printed news media commentators. The format selected may be paper, audio or video tape, machine-readable tape or discs, or motion picture film.

b. News releases. One copy of each prepared statement or announcement issued for distribution to the news media. News releases announce events such as the adoption of new agency programs, termination of old programs, major shifts in policy, and changes in senior agency personnel and may be a textual record such as a formal press release or nontextual record, such as film and video or sound recordings.

12. Agency Histories and Selected Background Materials

Narrative agency histories including oral history projects prepared by agency historians or public affairs officers or by private historians under contract to the agency. Some background materials (such as interviews with past and present personnel) generated during the research stage may also be selected for permanent retention. Excluded are electrostatic copies of agency documents made by the researcher for convenient reference.

13. Publications

Formally prepared publications printed by the Government Printing Office, the National Technical Information Service, or the agency itself. Examples of such publications include annual reports to the Congress; studies conducted by the agency or under contract for the agency; procedural brochures, pamphlets, and handbooks distributed for guidance to other Federal agencies, State and local governments, and private organizations and citizens; instructional and educational materials on audiovisual formats (audio or video recordings, motion pictures, filmstrips and slide-tape productions); maps; and film productions and television and radio programs prepared to furnish information on agency policies or promote agency programs and operations. The availability of reference copies of audiovisual items in non-Government depositories does not exclude retaining the original production elements required to ensure the preservation of the audiovisual items.

14. Visual, Audio, and Graphic Materials

Agency-originated motion picture film, still photography, sound and video recordings, cartographic materials, or architectural drawings created to record substantive events or information that cannot be or normally are not recorded in written form. Examples of these materials are instantaneous recordings or photographic coverage of significant scientific or technological phenomena and significant nonrecurring events, such as combat operations, lunar explorations, and extemporaneous occurrences, discussions, and interviews; maps recording topographic information for specific geographic areas, and architectural engineering drawings recording the building program of individual Federal agencies.

15. Scientific and Technical Data

Data resulting from observations of natural events or phenomena or from controlled laboratory or field experiments. These data generally are created at project or operating levels rather than at administrative levels. The data may be recorded in either human-readable or machine-readable format and be found in laboratory notebooks, completed forms, tabulations and computations, graphs, microforms, or machine-readable files. Scientific and technical data are selected for permanent preservation if they are unique, usable, and important. If these data are accurate, comprehensive, and complete, if they can and are likely to be applied to wide variety of research problems, then they can also be considered to have passed the test of usability. Data which can be recreated because they document repeatable activities may also be considered both unique and usable if they constitute a definitive, critical, or standard reference data set. The cost of data collection is one, but not the only, measure of its importance. In assessing the importance of any set of data, consideration should be given to its historical as well as its scientific significance.

16. Socioeconomic Micro-Level Data

Micro-level data collected for input into periodic and one-time studies and statistical reports including information filed to comply with Government regulations. The information may cover such subjects as economic and tax information, health care, demographic trends, education, discrimination, and other comparable social science areas. Although agency reports and studies, briefing materials, and official releases frequently summarize these data, the micro-level information, usually in machine-readable form, is of permanent value. Obviously, the data must be usable in their raw state if they have not been converted to a machine-readable form.

Appendix III-F

Examples of Federal Government Records Schedules

From: *Handbook on Files Maintenance and Records Disposition*, Office of the Secretary, U.S. Department of Health and Human Services

FPMR 101-11.4
October 1982

GENERAL RECORDS SCHEDULE 6

Accountable Officers' Accounts Records

This general schedule covers accountable officers' returns and related records, including records under the cognizance of the General Accounting Office (GAO). This schedule does not apply to the copies of schedules and related papers held by the Chief Disbursing Officer of the Treasury. Any records created prior to January 1, 1921, must be offered to the National Archives and Records Service before applying these disposition instructions.

Accountable officers' accounts include record copies of all records concerned with the accounting for, availability, and status of public funds. There are several types of "accountable officers," such as: (a) the collecting officer, who receives monies owed to the Federal Government and ensures that it is credited to the proper account; (b) the disbursing officer who is responsible for providing documentation to GAO since he accomplishes the actual payment of public monies to proper Federal creditors; and (c) the certifying officer, whose signature on a summary attests to the authenticity of vouchers listed on the schedule.

Disbursements for most civilian Government agencies are made by the Chief Disbursing Officer of the Treasury, who heads the Division of Disbursement of the Bureau of Government Financial Operations within the Treasury Department. Since July 1949, disbursements have been made for most agencies on the basis of certified schedules, with the detailed vouchers transferred to GAO from the agency or held in agency space if site audit was involved. This procedure was extended and confirmed by GAO General Regulations No. 115, issued January 29, 1952, which promulgated a standard form voucher and schedule of payments (Standard Forms 1166 and 1167) for use by all agencies effective July 1, 1952, and formally eliminated the transfer of vouchers of the Chief Disbursing Officer.

This schedule has been revised to include records held for on-site audit by GAO, as described in Item 1a below. Under on-site audit, vouchers, contracts, schedules, statements of transactions and accountability and other related supporting documents are retained in agency space for GAO auditors. Section 5 of the Post Office Department Financial Control Act of 1950 and Section 117(b) of the Budget and Accounting Procedures Act of 1950 (whenever the Comptroller General determines that audit shall be conducted at the site) require agencies to retain these records, which are under GAO cognizance. GAO has given general authority to the agencies, if the records are no longer required for administrative purposes, to transfer all audited records and any unaudited records more than one full fiscal year old to Federal Records Centers. However, to transfer unaudited accountable officers' accounts less than one year old, permission must be obtained from the Director, Office of Administrative Services, GAO. Because the records heretofore transferred to GAO are retained in the agency, some agencies have eliminated the creation of memorandum copies as described in Item 1b of this schedule.

Records relating to the availability, collection, and custody of funds include (1) the appropriation warrants, (2) other documents which deposit funds into the Treasury, and (3) documents which provide accountable officers with status reports on funds in their custody, such as the proofs of depository accoun. and statements of funds to their credit. Agency copies of these deposit and status documents are so intimately related to the accounts of these officers that they are included in this schedule. The copies received by the Fiscal Service of the Treasury Department are not covered by this schedule and are pr" ded for in separate schedules.

INTRODUCTION TO THE GENERAL RECORDS SCHEDULES

General Records Schedules (GRS) are issued by the Administrator, General Services Administration, to provide disposition standards for records common to several or all agencies of the Federal Government. They include records relating to civilian personnel, fiscal functions, accounting, procurement, communications, printing, research and development, and other common or housekeeping functions; and certain non-textual records. These records comprise an estimated one third of the total volume of records created by Federal agencies.

This edition includes two indexes, an index of commonly used Standard and Optional Forms and an alphabetical Subject Index. The forms index includes only the forms most often used by the various government agencies.

General Records Schedules are intended to cover only record copies. When it is difficult to decide whether files ar record or non-record materials, the records officer should treat them as records. Records officers may consult with NARS to determine the record o. non-record status of a particular file.

If copies of documents covered by these schedules are part of a subject or case file which documents activities different from those covered by the schedules, they should be treated in the same manner as the files of which they are a part.

The disposition instructions in the General Records Schedules are implemented without further clearance from the National Archives and Records Service, GSA, with the exception that most records created before January 1, 1921, must be first offered to NARS for possible permanent retention. GRS 3, 11, 15, 17, and 21 have other delimiting dates. Some items in the various schedules have no authorized disposition instruction. These are records which are common to many agencies, but due to agen needs and organizational structure will have differing retention periods. They may be permanent, but are not necessarily so. For these records, agencies are required to submit an SF 115, Request for Records Disposition Authority. This will allow an individual evaluation of the pertinent records in the context of office of origin, agency requirements, and possible archival value. Since disposition is not specified, such records should be included in the agency's comprehensive schedule.

In 1978 use of the GRS was made legally mandatory. The disposition authorizations must be used by an agency to the greatest extent possible. Because these schedules are designed to cover records common to several agencies, the records descriptions are general. Agency records officers are urged to make maximum use of the schedules either as an appendix to a printed agency schedule or tailored to their agency's own particular needs and incorporated into agency schedules. If an agency wishes to apply a different retention period for any series of records included in the GRS, the records officer of that agency must submit an SF 115, Request for Records Disposition Authority, providing justification for the deviation.

GENERAL RECORDS SCHEDULE 6

ITEM NO.	DESCRIPTION OF RECORDS	AUTHORIZED DISPOSITION
3.	Certificates Settlement Files.	
	Copies of certificates and settlement of accounts of accountable officers, statements of differences, and related records.	
	a. Certificates covering closed account settlements, supplemental settlements, and final balance settlements.	Destroy 2 years after date of settlement.
	b. Certificates covering periodic settlements.	Destroy when subsequent certificate of settlement is received.
4.	General Fund Files.	
	Records relating to availability, collection, custody and deposit of funds including appropriation warrants and certificates of deposit (SF 215), other than those records covered by Item 1 of this schedule.	Destroy when 3 years old.
5	Accounting Administrative Files.	
	Correspondence, reports and data relating to voucher preparation, administrative audit, and other accounting and disbursing operations.	
	a. Files used for workload and personnel management purposes.	Destroy when 2 years old.
	b All other files.	Destroy when 3 years old.
6.	Federal Personnel Surety Bond Files.	
	a. Official copies of the bond and attached powers of attorney.	
	(1) Bonds purchased before January 1, 1956.	Destroy 15 years after bond becomes inactive
	(2) Bonds purchased after December 31, 1955.	Destroy 15 years after the end of the bond premium period.
	b. Other bond files, including other copies of bonds and related papers.	Destroy when bond becomes inactive or after the end of the

ITEM NO.	DESCRIPTION OF RECORDS	AUTHORIZED DISPOSITION
		bond premium period.
7.	Gasoline Sales Tickets.	
	Hard copies of sales tickets filed in support of paid vouchers for credit card purchases of gasoline.	Destroy after GAO audit or when 3 years old, whichever is sooner.
8.	Telephone Toll Tickets.	
	Originals and copies of toll tickets filed in support of telephone toll call payments.	Destroy after GAO audit or when 3 years old, whichever is sooner.
9.	Telegrams.	
	Originals and copies of telegrams filed in support of telegraph bills.	Destroy after GAO audit or when 3 years old, whichever is sooner.

GENERAL RECORDS SCHEDULE 17

Cartographic, Remote Sensing Imagery, and Related Records

This schedule covers cartographic, remote sensing imagery, and related records that have been created by or for agencies of the Federal Government and those acquired by Federal agencies in the course of business. Records created prior to January 1, 1950, must be offered to the National Archives and Records Service before applying disposition instructions set forth in this schedule.

Cartographic records are graphic representations at reduced scale of selected cultural and physical features of the surface of the earth and other planetary bodies. They include maps, charts (hydrographic, nautical, weather, and aeronautical), photomaps, atlases cartograms, globes, and relief models. Related records are those records that form an integral part of the map-making process, such as field survey notes, geodetic controls, map history case files, source materials, indexes, and finding aids. Records of the map-making process in automated storage and retrieval system are covered by General Records Schedule 20.

Remote sensing imagery covers aerial photographs and other forms of visual images of the surface of the earth or other planetary bodies taken from airborne or spaceborne vehicles for the purpose of evaluation, measuring, or mapping the cultural and/or physical features of the landscape, and related tabular and graphic indexes necessary for the proper identification and retrieval of these records. Conventional aerial photographs taken from aircraft produce direct film images from cameras; other forms or imagery such as those from orbiting satellites sometimes require a conversion or alteration of sensor data for digital, electronic, or computerized forms to photographic or videographic images before they can be considered imagery. This schedule is limited to visual imagery. Digitized or computerized data are covered by General Records Schedule 20.

Cartographic and remote sensing imagery records that may have continuing legal, administrative, and research value are generally those that have been created or acquired in conjunction with the transaction of agency business or result from agency program responsibilities which constitute evidence of the organization, functions, decisions, and operations of the Federal Government. Additional descriptive information applicable to the disposition instructions for selected items is included in explanatory notes at the end of this schedule.

The General Records Schedule for cartographic, remote sensing imagery, and related records is broad in scope and meant to complement approved agency records schedules and other General Records Schedules. If an item in this schedule is at variance or is inconsistent with an approved agency records schedule, such discrepancies should be brought to the attention of the National Archives and Records Service (NARS). In such cases, disposition should be made in accordance with specific instructions provided by NARS.

GENERAL RECORDS SCHEDULE 1

ITEM NO.	DESCRIPTION OF RECORDS	AUTHORIZED DISPOSITION
3.	Published Maps.	
	One copy of each published map, atlas, portfolio, and photomap produced by an agency, including edition and variant, and all related indexes (in map or other form).	Permanent. Break file at regular intervals (1 to 5 years) and offer to NARS.
4.	Map History Case Files and Source Material.	
	Map history and chart history case files documenting the chronological events in planning, surveying, field work, and production and revision of specific maps, and files containing or describing the sources of information for specific maps, including map specifications, location diagrams, notes kept by the cartographers when making maps, maps or photographs from which information was abstracted, correspondence, reports, bibliographies, lists of sources, and papers showing information about the origin and spelling of place names.	Submit SF 115, Request for Records Disposition Authority.
5.	Maps on Microfilm.	
	a. If both original hardcopy maps and microfilm copies exist.	Submit SF 115, Request for Records Disposition Authority.
	b. If only the microfilm copies exist.	Dispose of in accordance with instructions for related hardcopy records.
6.	Computer Related Maps.	
	a. One copy of each published, manuscript, or computer produced map produced by the agency that shows such administrative information as the general geographic coverage of a computer system or the geographic location of all input stations used in the system.	Submit SF 258, Request for Transfer of Records.

ITEM NO.	DESCRIPTION OF RECORDS	AUTHORIZED DISPOSITION
	b. Hardcopy maps acquired as sources of data for a computer system.	Submit SF 115, Request for Records Disposition Authority.
	c. Computer-plotted maps (hardcopy printouts or microfilm output).	Submit SF 115, Request for Records Disposition Authority.
7.	Globes, Terrain Models, and Raised Relief Maps.	
	Three-dimensional terrain models and raised relief maps (made of plaster, wood, plastic, or other material).	
	a. One representative sample of each type.	Permanent. Offer to NARS within one year of production or when no longer needed.
	b. Remaining items.	Dispose of when no longer needed for agency use.
8.	Finding Aids.	
	Graphic or written indexes and other finding aids relating to maps.	Dispose of in accordance with instructions for related maps.
9.	Survey Field Notes, Geodetic Controls, and Computations (Hardcopy or Microfilm).	
	Field notes from surveys, observations, and explorations, consisting of a running account of the terrain, geological notes, a record of water depths, a daily log or journal, often in the form of pocket-size notebooks carried by the observer in the field, triangulation diagrams, aerial photographs annotated with geodetic control data, and survey computations.	Submit SF 258, Request for Transfer of Records.
10-15.	Reserved.	

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Designed by Ruth Magann

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