

## The National Personnel Records Center Fire: A Study in Disaster

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FIRES, FLOODS, AND EARTHQUAKES have robbed us of many of the legacies of the past. Fires, especially, have destroyed many historical records. Around 2200 B.C. records offices in Memphis, Egyptian capital of the Sixth Dynasty, were destroyed by angry mobs. The sacking of Rome destroyed much of the written record of that great civilization. The wars of the twentieth century brought disaster to great cultural assets including libraries and art galleries. In the United States several major fires in federal government buildings consumed important records and art objects. On November 8, 1800, a fire in the War Department robbed historians of much of the record of this department for the first decade of this nation's history. Vital materials relating to the fiscal activities of this country were destroyed in an 1833 fire in the Treasury Department. When the Patent Office burned in 1836, valuable records and significant models of the inventions which helped to shape the industrial might of the United States were destroyed. Significant paintings and other historical relics disappeared in the flames of an 1851 fire in the U.S. Capitol. Social scientists and demographers always will mourn the loss of the records of the 1890 Decennial Census lost in a 1921 fire in the Census Bureau. Each of these fires helped to diminish the cultural heritage of this nation. But in terms of size and impact—the number of records destroyed and the number of persons affected—none of the earlier fires equalled the disaster of July 12, 1973, at the National Personnel Records Center in Overland, Missouri.

As it exists today, the National Personnel Records Center is the outgrowth of several previous organizations. The center reflects a belief on the part of the National Archives and Records Service that all personnel records of former federal government employees, both civilian and military, should be housed in and serviced by one administrative unit. The civilian personnel records are in a building in South St. Louis constructed in 1960 as a general purpose federal records

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center. The military personnel records in the Overland building were a part of the Demobilized Personnel Records Center, which by 1960 had become known as the Department of Defense Military Personnel Records Center. The most significant preliminary step toward the establishment of a national center for personnel records was taken on July 1, 1960, when the General Services Administration assumed the operation of the Department of Defense Center in St. Louis and title to the property was transferred to GSA. Finally, in 1966 the St. Louis Federal Records Center and the Military Personnel Records Center were merged and renamed the National Personnel Records Center.

A personnel records center is rather specialized. Instead of the great diversity of records handled in the Federal Archives and Records Centers located throughout the United States, the center in St. Louis is, for the most part, concerned with only one type of record: the record of service, civilian or military, within the federal government. One might easily assume that handling such records is largely a routine task, but such is not the case. There is great diversity in the manner in which personnel records have been maintained in the United States. Each military service has used different systems of recordskeeping. Even the civilian sector has records of many different types. Thus an element of complexity is present in the operation of the centers.

Each day the National Personnel Records Center receives thousands of requests for information from its records. Information is needed for such matters as loan applications, for retirement credit, for use in locating long-missing members of families, or perhaps for determining a forgotten date of birth in order to qualify for Social Security benefits. In order to administer so large an organization, the center has a sizeable management staff responsible for overseeing all operations including a computerized index to many of the holdings. The size of the staff requires having comprehensive administrative procedures manuals detailing the complexities of reference activity. Much of the reference takes place, however, not in offices but in the records storage areas. Staff members, working from specially designed carts, locate files, search them for needed information, and complete the forms which will be mailed to the requester. This "work-in-file" concept has greatly improved the efficiency of the reference activity.

The building which houses the military personnel records is something of an architectural landmark. In 1951, the Department of Defense asked the St. Louis firm of Hellmuth, Yamasaki, and Leinweber, Inc., to design a new building to house the Demobilized Personnel Records Center, which was located then in an existing facility in St. Louis. Study teams from the firm visited several records centers, including one operated by the U.S. Navy at Garden City, New York, and one operated by the Department of Defense at Alexandria, Virginia. In addition, a study team spent several months analyzing functions, interrelationships, and space requirements of the existing center in order to determine what space and facilities should be included in the proposed new building. The findings were incorpo-

rated in a report the study team submitted in February 1952 entitled "Report of Existing Facilities and Program Requirements for Defense Military Personnel Records Center."

In light of subsequent events, the portion of the report dealing with the centers in Garden City and Alexandria is especially significant. The Navy center was completely sprinklered as a firesafety precaution. Senior personnel there strongly advised the architect's survey team to include sprinklers in the new Missouri facility. Opposing advice was received from Alexandria where senior officials at the Department of Defense facility indicated that water damage was more feared than fire damage. In retrospect, such a feeling about water is natural when one considers that part of the facility in Alexandria was located at the edge of the Potomac River where flooding was a recurring problem. The conflicting advice given to the architectural team, however, was a realistic reflection of the debate then taking place among archivists and librarians about the benefits and dangers of sprinklers. Apparently the case against sprinkler systems was presented more forcefully to the architects. When the planning of the actual structure was completed, sprinkler systems were missing from the design. The basis for the disaster twenty years later was beginning.

The evolution of the design is an interesting story. When the Defense Department outlined its building requirements to the architects, the department suggested that the building should be a large square, six stories high. The economy inherent in such a plan obviously appealed to the department. The architects, however, believed that several disadvantages existed in such a scheme, including a poor functional layout and a troublesome problem of vertical circulation within the building. Finally, the architects decided to study the functional requirements of each of the military services to be housed in the center. Approximately sixteen weeks of preliminary design work resulted in nine significantly different building proposals. Then each proposal was studied by a different team of architects for approximately three weeks. Following this study of all the proposals, two were selected for additional study during a fifteen-week period. The resolution of the two different schemes resulted in the design finally executed. Forty weeks were spent in preparing the working drawings and specifications.

The structure that evolved from the visits, analyses, and discussions is imposing even today in its truncated five story version. Erected by the U.S. Army Corps of Engineers at a cost of \$12.5 million, the solid structure reflects the long experience of the engineers as builders of dams and tamers of rivers. The sheer bulk alone makes a strong impression on the viewer, and the vast scale tends to overwhelm the quiet St. Louis suburban community of Overland where the building rises on a seventy-acre site. Its size is difficult to comprehend, even when one is inside. The building, 728 feet long, 282 feet wide, six stories high, presents an impassive facade to the world with its rather bland curtain wall of glass and aluminum. The exterior regularity is

broken only by several canopies projecting over entrances and by a small ancillary building designed to house a cafeteria and meeting rooms for the center staff.

The years following the 1956 completion of the building were active ones. The number of individual personnel records in the center increased from 38 million to more than 52 million. As a result of improved management practices, GSA made significant reductions in the size of the staff needed to operate the center. The building became crowded, however, not only with constantly increasing records holdings, but also with additional staff at the Army Reserve Components Personnel and Administration Center and with many tenant agencies including the Federal Bureau of Investigation, several other federal intelligence agencies, and liaison offices for the Navy, Air Force, and Marine Corps. More than 2,200 personnel were working in the building by July 1973. Although they planned the building to house four thousand employees, the architects obviously had not expected the records holdings to expand with such rapidity. In addition to a significant increase in the number of personnel records, the accessioning of nearly one-half million cubic feet of records of military units added to the shortage of storage space.

During the years prior to 1973, the MPRC building itself became one of the serious problems faced by the National Archives and Records Service. Although its design reflected careful planning, in actual function it was not a successful records center, being a somewhat curious blend of warehouse and office space. Perhaps the most notable difficulty was the lack of adequate provisions for firesafety. On each of the floors—particularly those from the third floor up—were large spaces unbroken by firewalls. Only the office areas, grouped along the north side of the building and separated from the records storage area by a single concrete-block wall, interrupted the more than 200,000 square feet of space on each floor. As early as 1956, the year the center was completed, the National Archives and Records Service had decided that in the future all records center buildings constructed under its auspices would be equipped with sprinklers and smoke detection devices. It was thus natural that NARS was concerned with the serious lack of firesafety provisions in what was then the largest of the centers in the nationwide records center system. That these fears were not unfounded became apparent in July 1973.

At sixteen minutes and fifteen seconds past midnight on July 12, 1973, a typical warm and humid summer night in St. Louis, the first alarm reached the North Central County Fire Alarm System, Inc., the communications link for the many fire districts surrounding the center. The call came from the Olivette Fire Department. Twenty seconds later another alarm call was received via the direct fire phone located in the center, this one from a guard who had been notified of the fire by an unidentified motorcyclist passing the building. One minute and ten seconds after the first call, three pumpers and two other emergency vehicles from the Community Fire Protection District were dispatched

to the scene. Four minutes and twenty seconds after the first call, two trucks were on the scene. By 12:34 A.M. at least one fireman was on the fifth floor and reported heavy smoke and extreme heat on the sixth floor. The continuing stream of recorded communications traffic bears testimony to the strenuous efforts to fight the fire. As alarm after alarm was sounded, including a sixth alarm at 1:34 A.M., more and more fire districts arrived on the scene. Eventually forty-two fire districts were involved in fighting the fire. These men were under the command of Community Fire Protection District Chief John Gertken and his deputy, John Kennedy, the first senior fire company official to arrive on the scene.

Initial efforts to fight the fire involved snorkels pouring water from the exterior perimeter of the building and hose companies working on the sixth floor. At 1:05 A.M. firemen on that floor reported that heavy smoke made it impossible to locate the source of the fire. Men remained on the sixth floor fighting the fire from the interior of the building until 3:15 A.M., when conditions deteriorated to the point that the internal firefighting had to be abandoned. The men were pulled back from the sixth floor. For the next two days, their efforts were confined to pouring water on the fire from outside the building.

By 6 A.M. the fire companies on the scene were having difficulty getting sufficient water pressure. At 6:12 A.M. a request went to the water company to increase the pressure if at all possible, and eight minutes later the fire was spreading across the entire length of the building. Shortly before 9 A.M. another call for increased water pressure was issued, but by 10:31 A.M. the entire roof of the building was on fire. By 11:22 that morning the west wall on the sixth floor was leaning six to eight inches from the vertical.

During the day, as firemen continued to be plagued by lowered water pressure, concern grew steadily about the spread of the fire to lower floors of the center. At 5:36 P.M. it was reported that fire was spreading in the east stairwell, and shortly after 9 P.M. there was word that the roof was completely involved and that if the fire was not controlled it undoubtedly would spread to the fifth floor.

Through a continuous flood of water to the top floor during July 13, however, firemen were successful in keeping the fire from spreading onto other floors. By 2:44 A.M. on the morning of July 14, for the first time in forty-eight hours, firemen were on the sixth floor. Shortly before noon that day the drive shaft, clutch bearings, and gears failed on a pumper truck that had been operating without interruption for more than forty hours. Then, at 4:49 that afternoon, a fire was discovered in the sixth floor vault, and its door was opened to allow firemen access. They promptly extinguished the blaze. On the afternoon of July 15, heavy smoke began pouring from the southwest corner of the building, and firemen were dispatched up a ladder to direct more water on the fire. The number of fire-fighters at the scene dwindled, and by 8:49 A.M. on the morning of the sixteenth of July, only one company remained. Officially, as far as the fire department

was concerned, the crisis was over, but the long days of recovery and rehabilitation were just beginning.

Fighting the fire was not the only activity on July 12 and subsequent days. Many difficult decisions had to be made, decisions that would affect the entire federal government and eventually millions of America's veterans. As government officials arrived from Washington and other locations, the first slow, hesitant steps toward recovery began.

An essential first step was stopping the mail. Each day the National Personnel Records Center receives thousands of requests for information and processes thousands of new military service records arriving for the first time. In order to stem the flow of incoming requests and records, instructions went to all government agencies early on July 12 asking them to hold pending shipments and requests for information until further notice. Although this action caused considerable hardship both to government agencies and to the U.S. Postal Service, the full cooperation was gratifying.

Another major task was the salvaging of vital records. Several items of great importance were removed from the center on July 12. First were the computer tapes that serve as an index to a major segment of the center's holdings. Simultaneously, plans were made for off-site computer operations so that the center could resume at least some reference activity as soon as possible. Valuable operating records of the center were removed at the same time. Another group of materials removed from the building consisted of more than 100,000 reels of microfilm of morning reports from the Army, 1912-59, and the Air Force, 1947-59. The value of these microfilm copies was emphasized dramatically when it was determined after the fire that the heaviest destruction had taken place among the Army and Air Force records covering the same time span. The microfilm suffered damage, including some image loss and splice weakening, as a result of the high humidity and temperature inside the building. A second copy of the film was available for use in reconstructing and replacing the lost segments of the film. The amount of image loss was quite small, being something less than 5 percent.

Other actions taken in the first days after the fire included the issuance, on July 23, 1973, of a Federal Property Management Regulations Bulletin (FPMR B-39), directing all federal agencies to suspend immediately the disposal of any records that might be used to reconstitute military service data. Prior to formal issuance of the bulletin, informal notice had been sent to all involved agencies. The first FPMR Bulletin has been modified subsequently and the restrictions eased, permitting normal destruction of records except for those containing information relating to service in the Army, 1912-59, and the Air Force, 1947-63.

The establishment of an Interagency Military Personnel Records Policy Working Committee to determine alternate sources of the in-

formation destroyed in the fire has proved to be a useful move. Consisting of representatives from the Army, Navy, Air Force, Coast Guard, Defense Department, Veterans Administration, Selective Service, and the National Archives and Records Service, this committee has met several times to exchange information about records in their custody useful in reconstruction efforts.

One short-term impact of the fire was its direct effect on the more than two thousand employees who worked in the building. The staff of the National Personnel Records Center was placed on administrative leave until Monday, July 23, and employees of the Reserve Components Personnel and Administration Center were relocated to another government facility in St. Louis. As soon as the control of the building was returned to the government on July 16, the initial recovery efforts began without delay. In order to coordinate the effort, General Services Administration head Arthur F. Sampson named a project manager to oversee every facet of the recovery operation. A senior GSA official from Washington received this assignment. His staff consisted of GSA personnel and private consultants and represented a wide range of experts in many fields. All decisions concerning the demolition of the building and records recovery were cleared through his office. Early morning staff meetings enabled all of the interested parties to exchange ideas and to remain informed about the progress toward recovery. Temporary office facilities were established adjacent to the fire-damaged structure in a building normally used as a cafeteria.

Recovery of records from the sixth floor and the resumption of center operations were top priority matters for the National Archives and Records Service. Although the rapid achievement of these goals sometimes came into direct conflict with the stringent safety regulations in effect after the fire and with the desire to proceed as rapidly as possible with the demolition effort, the goals generally were achieved with minimum difficulty. Once the NARS objectives were stated clearly and understood fully by the other groups involved in the recovery operation, an impressive spirit of cooperation developed.

Access to the sixth floor by the center staff was of paramount importance. It was not really known what, if anything, had survived in the fire area; but the first impression, once access was permitted under very carefully controlled conditions, was that of total destruction. Large reinforced concrete columns were sheared off, causing the collapse of the reinforced concrete roof slab. Shelving units were twisted by the heat; and only a small, bread-loaf-sized chunk of ash remained of what had once been six Federal Records Center cartons. Rows of cabinets that once contained IBM tab cards were melted away almost completely with only the skeletal remains of the drawers stacked in neat vertical piles. In some areas the roof slab was supported only by filing cabinets, which had been double decked in some areas on the sixth floor. Other filing cabinets, seemingly intact, held only small,

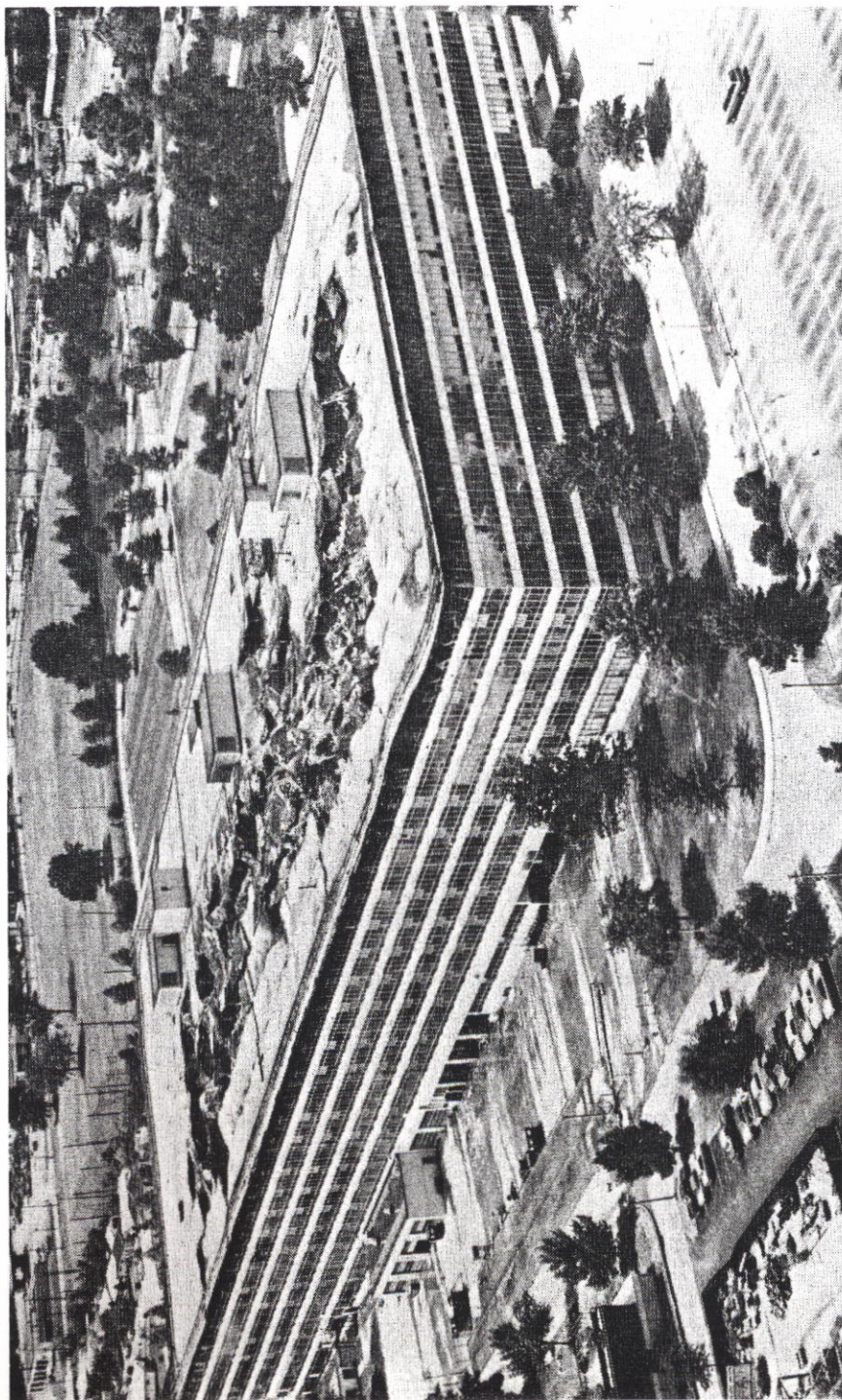
charred piles of ash. Aisles between shelving rows were filled with debris stacked up as much as three feet, and several inches of water covered the floor.

Water was the cause of the most serious problems in the center after the fire was extinguished. Millions of gallons were poured into the building, and every one of the center's six levels had several inches of water standing on the floor. The summer in St. Louis is not noted for its moderate temperature, and the high heat and humidity combined rapidly with the standing water to create a situation ripe for the growth of mold. Since paper is easily damaged by mold, a thymol solution was sprayed throughout the center to prevent the loss of additional records. Water damage was heaviest on the fifth floor where the bottom row of a group of Coast Guard records was completely soaked by water. Other water-damaged records were scattered throughout the building, especially near utility areaways and points where major internal pipe runs penetrated the floor slabs. Water flowed down through the building freely and did so for some time after the fire was out. To stop sporadic rekindling, the contract firemen were still using water on the sixth floor until late July. In addition, broken water lines on the sixth floor continued to flood the building until the laborious task of locating pipe runs could be completed and the flow of water stopped.

The fire had ruined the internal utility systems in the building, particularly the electrical system. The two major banks of escalators, the two freight elevators, and the single passenger elevator were heavily damaged, severely complicating the removal of wet records from the building. A spirit of ingenuity came into play, however, shortly after the fire, when it was discovered that the rubber handrails of the escalators, covered with generous amounts of a well-known liquid detergent, made excellent conveyor slides from the upper floors of the center. Wet records were removed from the shelves, reboxed into new center cartons, and then rapidly moved down the escalator guide rails, assisted gently at each level by personnel in a human chain. Eventually an external elevator, known as a "buckhoist," became the prosaic but efficient replacement for the escalator guide rails.

Simultaneously, efforts were underway to determine what records were destroyed in the fire and what might be recovered. Although even today the final chapter on the recovered records has not been written, the situation as it unfolded in July 1973 indicated that only 10 percent of the 22 million personnel jackets stored on the sixth floor at the time of the fire could be recovered. The first visit to the sixth floor by damage assessment teams indicated that the Army records, 1912-59, had suffered the greatest damage; the Air Force records, 1947-63, for persons with surnames beginning with the letters I through Z, were less seriously affected; and records of Army personnel discharged between January 1 and July 11, 1973, had survived the fire with very little loss. These recent Army records were located at one end of the floor on the perimeter of the building and were accessible to the firemen's hose

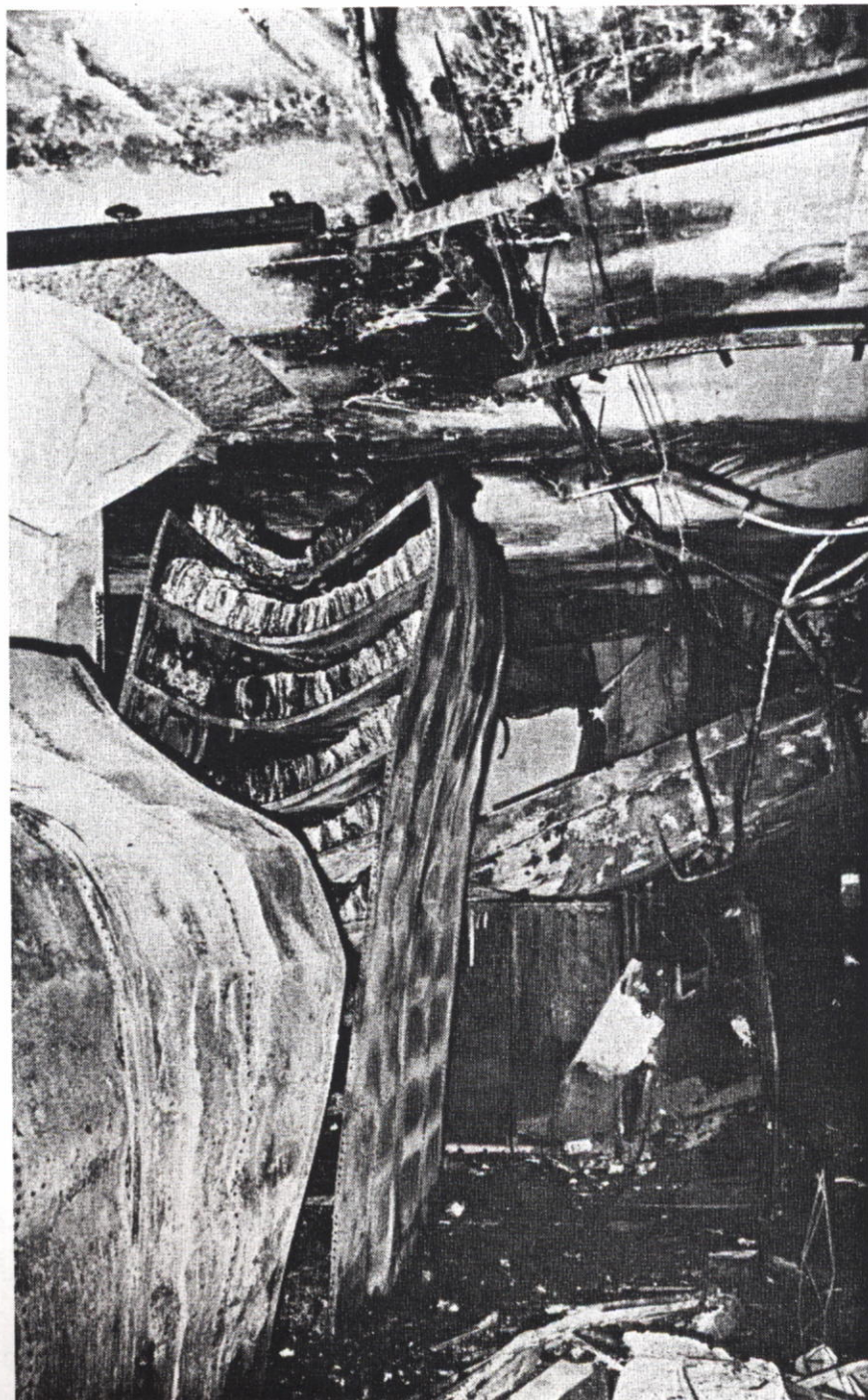




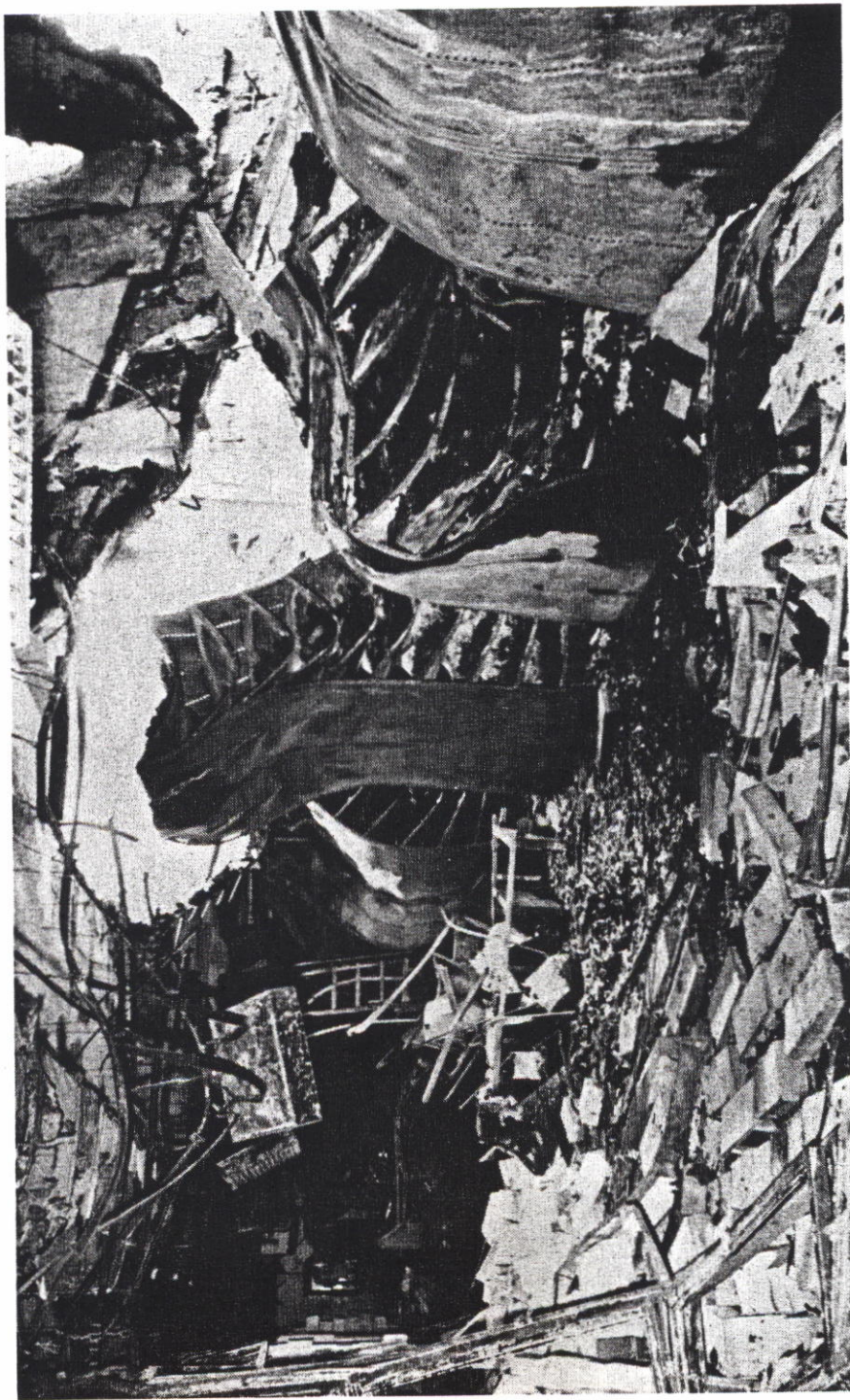
National Personnel Records Center showing serious roof damage. (Photograph by Arteaga Photos.)



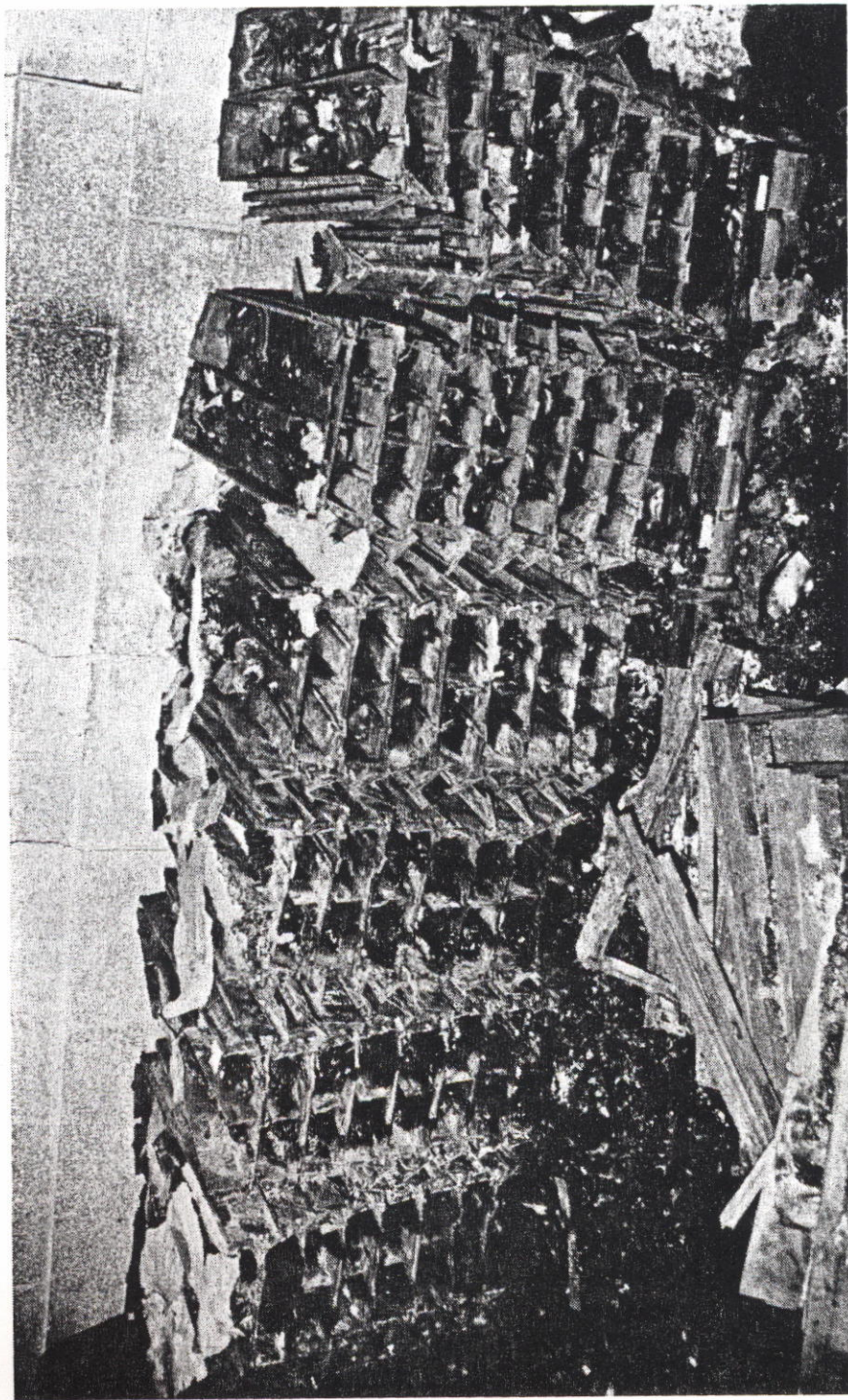
Fire department snorkels fighting the fire. Note the outward deflection of the sixth floor curtain wall.



Shelving crushed by the collapsed roof of sixth floor records storage area.



Damaged shelving, broken sections of concrete roof slab, and sky in background.



Cabinets once used to store tab cards.



Shelves and ashen records. Approximately six cubic feet of records were on each shelf.

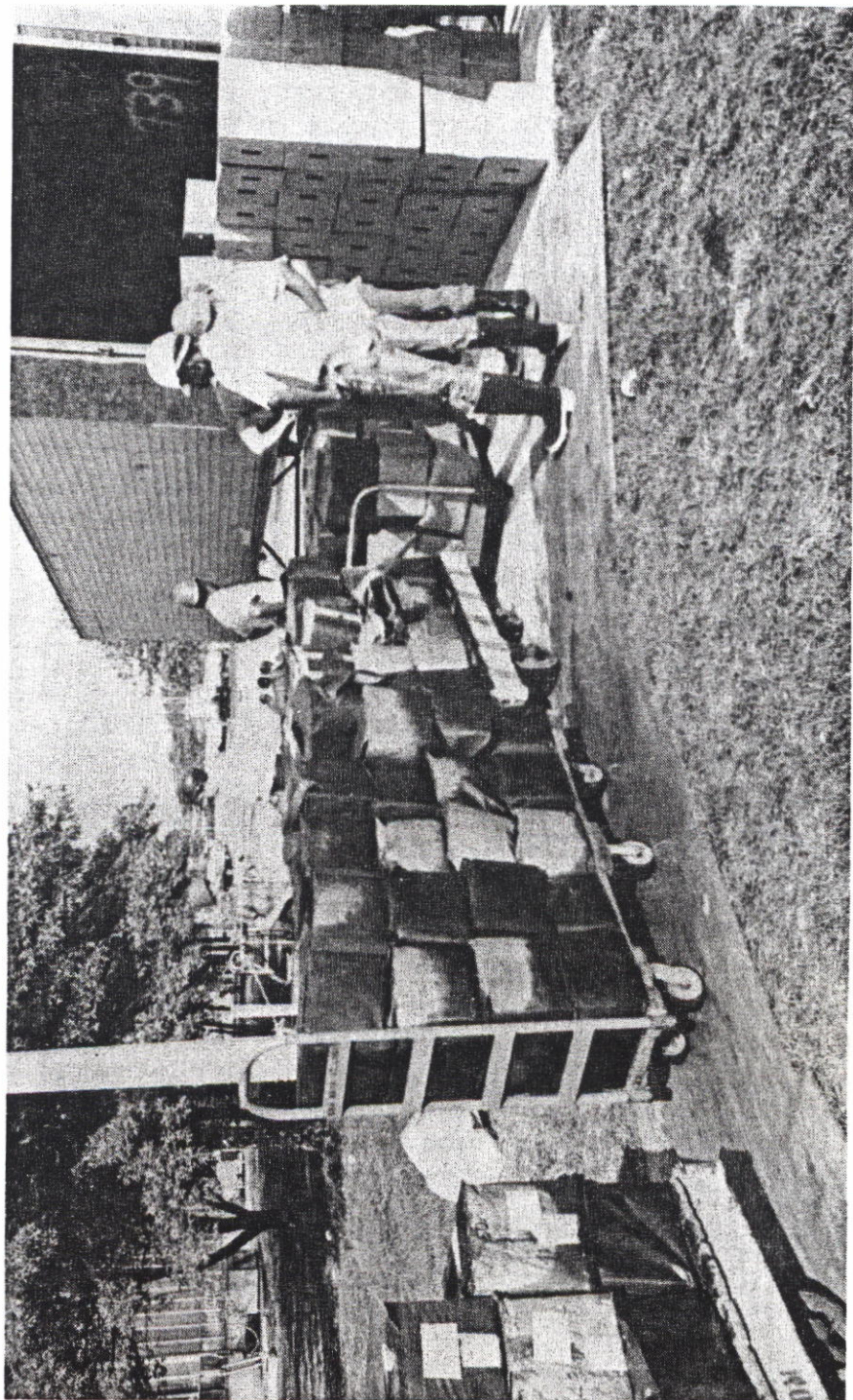


Escalator being used to convey water-damaged records from the fifth floor.

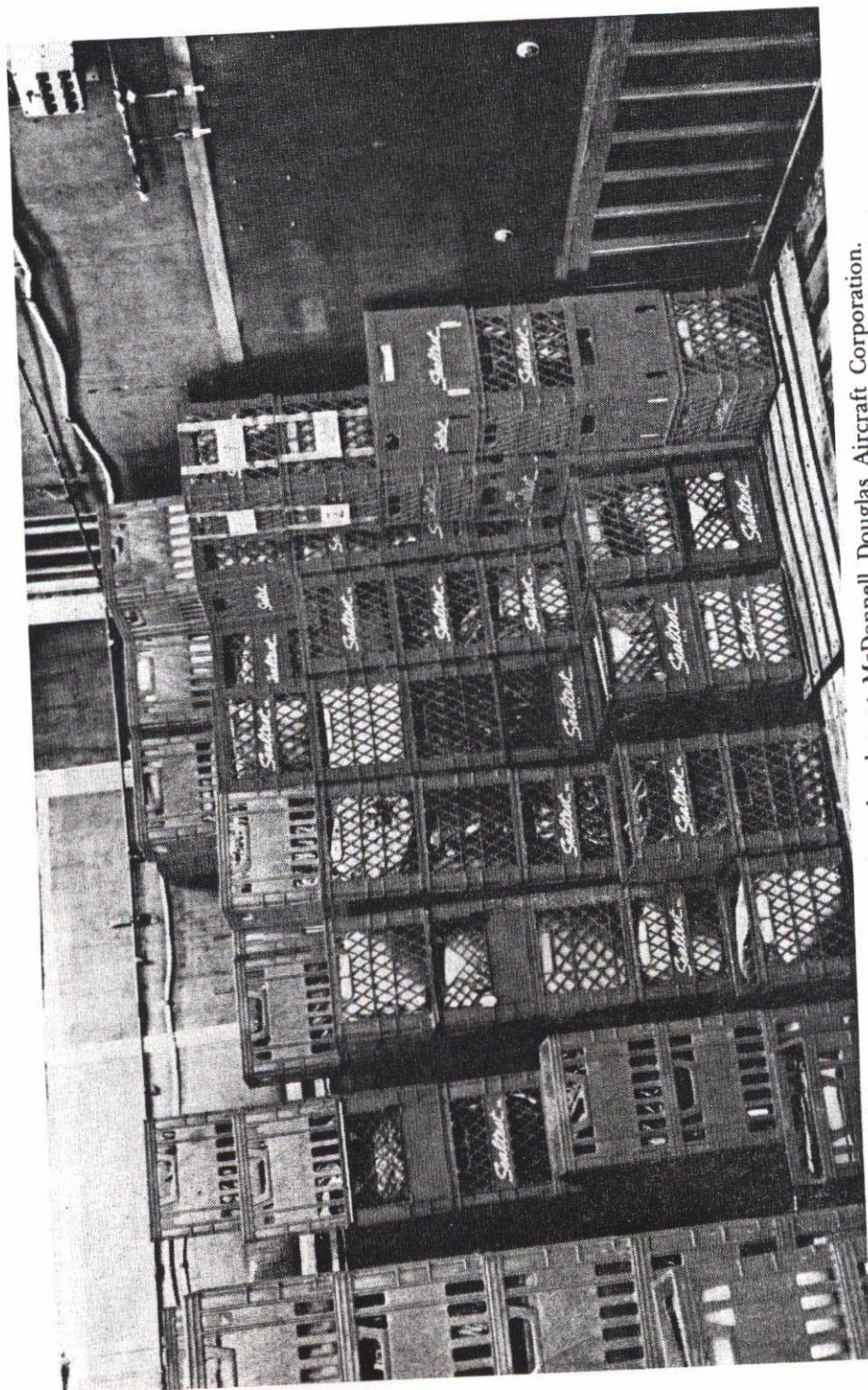


Walter W. Stender and Center Director Warren B. Griffin (in background) removing vital operating records during the fire.

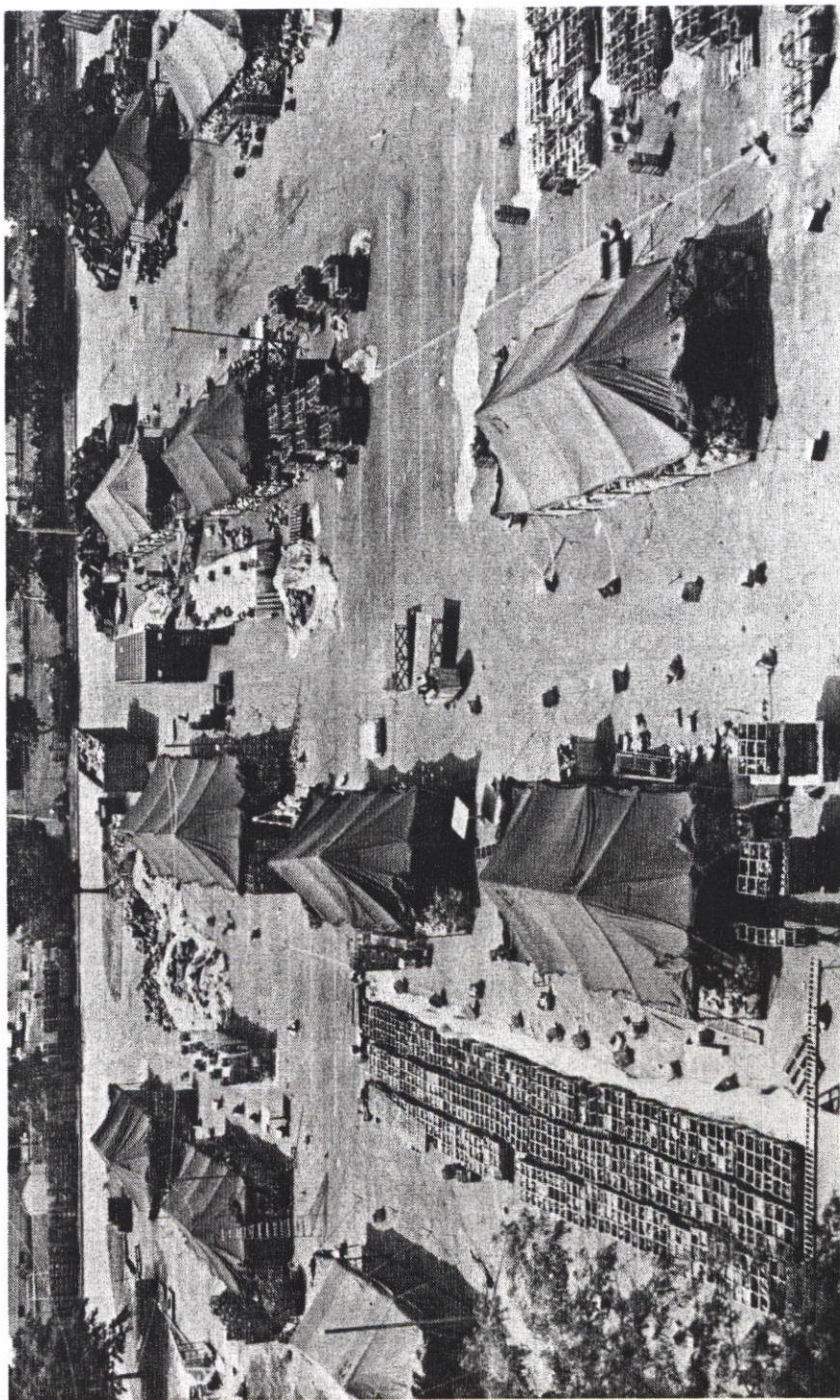




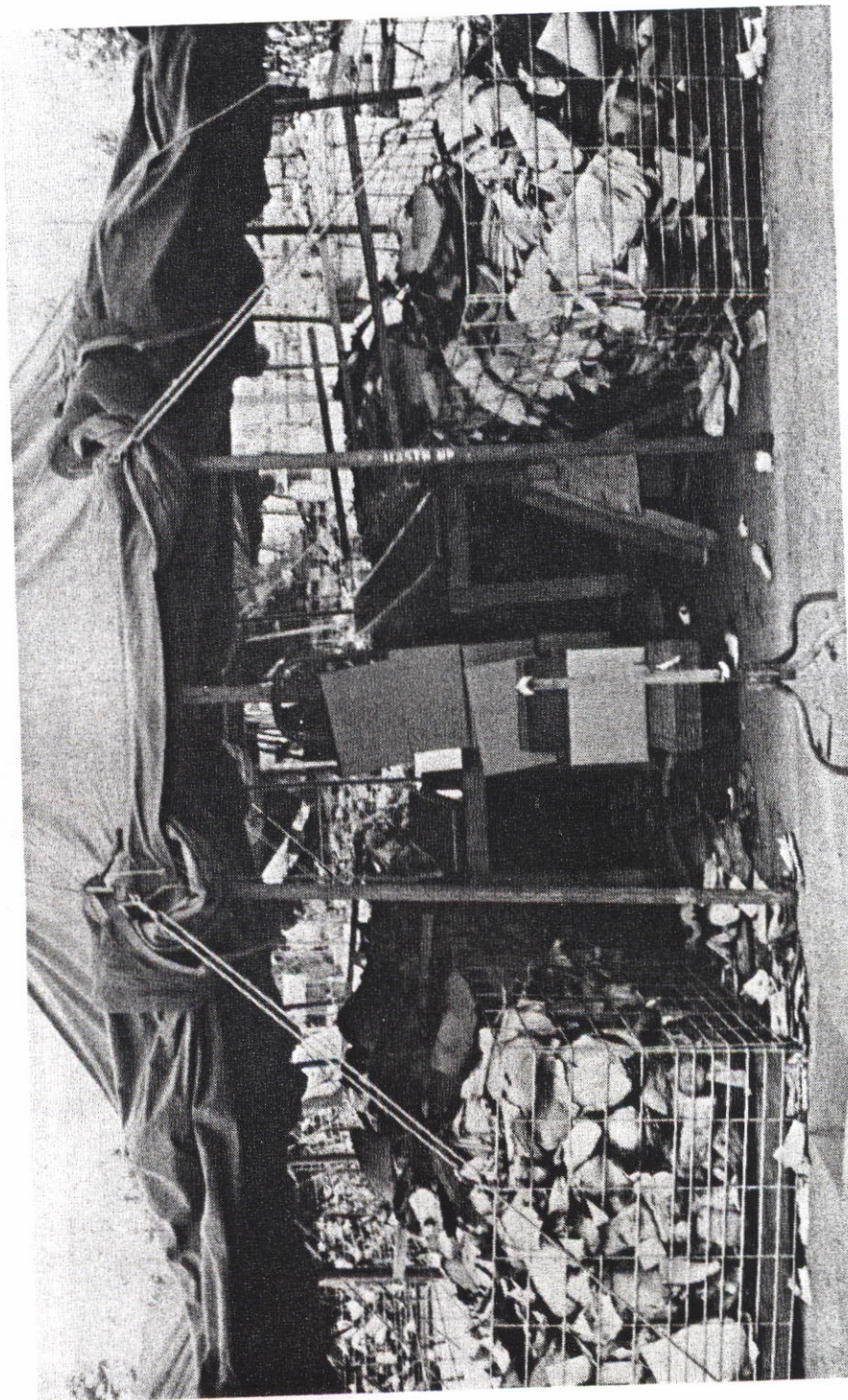
Wet records being shipped to the Civilian Personnel Records Center for drying.



Records being vacuum dried in space simulation chamber at McDonnell Douglas Aircraft Corporation.



Part of "Tent City" showing some of the dozens of tents and the thousands of milk carton containers used in the drying process.



Under tents, records drying in pens made from "hog fencing."



Workers in "Tent City" emptying and sorting bags of wet records from the sixth floor.



National Personnel Records Center after removal of the fire-damaged sixth floor. (Photograph by Larry Brock.)

streams. Later, as the demolition operations began, it was discovered that a considerably larger number of records than expected earlier had survived the fire.

Officials of the National Archives and Records Service believed that every possible effort should be made to resume near-normal operations as quickly as possible. It was important to management that personnel return to work without loss of pay—a concern shared by the employees' union. The staff returned to work on July 23 and assembled on the lawn for a briefing. Work then began in the cafeteria building that had been used primarily as a training and assembly area before the fire. Even under these adverse conditions, it was possible to begin processing reference requests pending at the time of the fire and not destroyed.

Other immediate post-fire actions included a temporary reorganization of the center's staff and a sizeable increase in the number of employees. The reorganization, effective August 13, established a Records Recovery Branch with principal responsibility for the recovery, restoration, arrangement, and description of fire- and water-damaged records. In addition, the Army, Navy, and Air Force Reference Branches, previously separated, were merged into two Reference Branches, one daytime and one nighttime, each handling the functions previously performed by the service-aligned branches. The Recovery Branch also operated on a two-shift basis.

With the center's staff back at work, although in temporary and less than optimum working conditions with no food service, limited drinking water, and extreme overcrowding, attention was turned to longer-range recovery operations, including the demolition of the sixth floor and the investigation of the cause of the fire. Award of a demolition contract to the Alberici Construction Company on July 23 marked the beginning of a significant phase in the recovery effort. Because of the severe damage on the sixth floor, several areas were extremely hazardous to enter. In some places, access was impossible because of the collapsed roof. Other areas were off limits because of the buckling outward of the exterior wall. As a result, damage assessment had covered only those areas of the floor which could be visited without exposing the staff to undue hazards. When the contractors began the laborious, dangerous, and time-consuming task of demolishing and removing the sixth floor, it became possible for the first time to determine conditions in some previously inaccessible areas. It had been expected that destruction, particularly in the center of the building, would be almost total, with little possibility of recovering any records.

The first step in the demolition involved breaking up the remains of the roof slab. Using jackhammers, the wrecking crew first broke up the concrete, leaving only a mesh of steel reinforcing rods. Then, using acetylene torches—with fire hoses standing by to prevent any possible rekindling of the fire from flying sparks—the crew cut the steel mesh into sections which could then be lowered over the side of the

building. Large boom cranes were used to lift "dumpster" type containers to the roof where they were filled with debris, lowered to the ground, placed on truckbeds, and removed to a dumping ground. After the roof slab was demolished and removed in a particular area, frontloaders (small bulldozers) and backhoes were placed on the roof to lift and remove the fire-damaged shelving units.

At this point, an interesting condition was discovered. It was learned that in the most heavily damaged areas of the building—areas where the shelving units had been melted by the heat and the roof had totally collapsed—some records could be recovered. It appears that as water poured on the sixth floor, the water level must have reached a depth of six inches or more, thoroughly soaking the boxes on the lower shelves and preventing them from igniting. The lower row of boxes was protected further when, as the fronts of boxes on upper rows of shelving burned off, the contents of the boxes spilled into the aisles. Although much of what spilled out ignited and burned, a considerable amount fell into the water-filled aisles, failed to ignite, and at the same time provided additional insulation for the bottom row of boxes. Thus, recovery of material in the aisles, again in severely fire-damaged areas, was possible. Although the recovery of any records was welcome news, the magnitude of the effort increased greatly as the demolition progressed and as ever-increasing quantities of relatively undamaged wet records were discovered.

Investigation of the cause of the fire began even while the flames were raging through the sixth floor. Shortly after the outbreak, agents from the Federal Bureau of Investigation sought evidence of arson. The FBI investigation, like other subsequent investigations, could not determine precisely the fire's cause, point of origin, or time of ignition. The destruction was such that it is unlikely that the cause can ever be fully determined. However, every effort has been made to learn as much as possible about the fire and its origins. A detailed examination of its causes and background by a General Services Administration Ad Hoc Committee on the Fire, established on July 13, also failed to uncover any information about the fire's cause. A series of extensive interviews with nearly all the persons in the building during the night of July 11 and the early morning hours of July 12 also failed to turn up any significant evidence. Several persons who left the sixth floor just prior to midnight indicated to the staff members of the Ad Hoc Committee that they noticed nothing wrong when they left the floor.

Similarly, none of the investigations revealed any evidence of mechanical causes of the fire. Although it is possible that an electrical failure of some type might have started the blaze, the destruction of the building structure and the mechanical systems on the sixth floor was such that it was impossible to isolate a definite cause.

As more than ten thousand cubic feet of wet records were removed from the lower floors of the building and as the additional thousands of cubic feet of records that suffered both fire and water damage were taken from the sixth floor, NARS officials found themselves facing the



largest records drying operation ever undertaken. A temporary facility was established at the Civilian Personnel Records Center, some twelve miles from the military center, using hastily constructed drying racks assembled from shelving components available there. Records were removed from the building, sprayed with a thymol solution to prevent mold, and then loaded on trucks for shipment to the civilian center. Eventually, plastic milk carton baskets were used. What was initially a small supply of these baskets increased until the collection numbered some thirty thousand. The baskets were ideally designed, not only for open-shelf drying, but for the more sophisticated drying system which eventually replaced it.

Some days after the fire, NARS officials learned of the existence of vacuum-drying facilities at the McDonnell Douglas Aircraft Corporation installation in St. Louis. Developed as a part of this nation's space effort, the chamber used in drying the wet records had originally been constructed in order to simulate conditions in outer space during the ground testing of space systems used in the Apollo series of space shots.

Although freeze drying is a widely used technique employed in the rehabilitation of wet records, books, and art objects, vacuum drying is an entirely different process which has proved to be successful in drying records. Considerable misunderstanding exists in the public mind about the vacuum-drying process, not to be confused with the freeze-drying process. The latter process is particularly useful when materials must be held in a frozen state in order to prevent mold growth and deterioration. In fact, temporary arrangements were made for refrigerated freight cars to be placed on a siding near the military center, should they be needed in the recovery operation; but the success of vacuum drying made the use of the cars unnecessary. The vacuum-drying process offers many advantages, especially when dealing with large quantities of material.

With nearly ninety thousand cubic feet of records to be dried, the difficult situation at the St. Louis center would have been more complicated if it had not been for the success of the vacuum-drying system. As soon as the first tests were completed satisfactorily, the drying of the records proceeded on a priority basis. Use of the first chamber at McDonnell Douglas was supplemented eventually by the use of two additional chambers and finally by the use of a similar chamber at a National Aeronautics and Space Administration facility in Sandusky, Ohio.

The water- and fire-damaged records were placed in plastic milk carton containers and then were stacked nine high on forty-inch by forty-inch wooden pallets and loaded directly into the chamber. At that time, the material is at ambient (room) temperature. Air is evacuated from the chamber by a steam ejector until the temperature in the chamber reaches the freezing point. The chamber is then filled with hot dry air and purged with this air until the wet material is warmed to 50°F. The number of cycles required depends on the

initial wetness of the material. The effectiveness of this process is indicated by the fact that during a typical loading of one chamber holding two thousand milk containers, approximately eight pounds of water were removed from each container. Thus a total of nearly eight tons of water was removed during each chamber loading.

In addition to recovering and drying records, other significant actions were taken in order to speed the recovery effort. Access to most of the personnel records received by the center since the early 1960's is through the use of a computer-controlled index. This system greatly facilitates prompt reference service by enabling center staff to determine the existence and location of a service record with a minimum of difficulty. Shortly after the fire, it was decided to establish a new computer index that would include all of the records recovered from the fire-damaged sixth floor as well as those which had suffered water damage. The new computer index or registry was named the "B" file. As records were dried, they were either returned to the military center or sent to the civilian center where keypunch operators prepared punchcards used as input documents for the computer system. Key punching has continued on a double shift basis since shortly after the fire. One byproduct of this operation is a computer-generated label which is attached to a file folder containing the recovered and dried records. These folders are then boxed and returned to the shelves. By the end of June 1974 virtually all of the recovered records were included in the "B" registry system. Current estimates indicate that more than 4.5 million records have been recovered.

Reconstruction of service data in response to requests for information has become a major activity at the center since the fire. This reconstruction is not without precedent. Alexander the Great faced the same problem when, during one of his campaigns, a tent containing valuable records was destroyed by fire and he had them reconstructed by directing his field commanders to supply copies of the orders and other instructions they had received. To fulfill this important function, a second reorganization of the center staff was effected on December 28, 1973. It returned the center to the same organization, generally, that existed prior to the fire; therefore the staff members who are specialists in the personnel records of a particular military service are once again using their knowledge to the best advantage. There was one significant difference—the establishment of a Records Input and Reconstruction Branch, with major responsibility for solving the reference problems caused by the fire. After resuming limited reference service in August, on records other than those involved in the fire, the center began accepting, on October 23, 1973, requests for information from all records holdings. Answering these fire-related requests by means of alternate sources of information is a time-consuming process with greatly increased expenditures for staff and equipment. For many years to come the problems caused by the fire will result in increased operating costs.

Reconstruction of service data requires the use of microfilmed morning reports and many of the other alternate sources of information located by agencies with membership on the Interagency Military Personnel Records Policy Working Committee. In addition to the morning reports, the record holdings of the Veterans Administration are being used extensively. Arrangements have been made for direct access to the VA centralized computer index in Austin, Texas, and a manual input to this system was begun on October 23, 1973. Success with this operation led to the installation of a communications link for direct input to the computer. Since February 4, 1974, the system has provided twenty-four-hour response on regular requests and ten- to fifteen-minute response on priority requests. The excellent cooperation from the VA and other government agencies in making record resources available for reconstruction purposes has made the center's task less difficult.

Not all of the problems faced in St. Louis since July 1973 have involved reference activities, records recovery, or organizational changes. A significant question has been the resolution of the space problem within the building. Loss of the sixth floor created a major problem in a building already utilized for records storage to a far greater degree than was originally anticipated. Although it was first believed that, from the standpoint of space, the loss of the sixth floor was less significant because of the parallel loss of nearly 400,000 cubic feet of records, this assumption does not take into account that, although the records are gone, the need to perform a reference function still exists. The sixth floor, in addition to records, contained approximately 27,000 square feet of office space to which more than 250 employees were assigned. The need for space was critical.

With the help of the project manager and other interested officials, plans were worked out which enabled the center to meet its space needs for at least two years. Certain accessioning functions were transferred to the civilian center, other tenant agencies were relocated into previously underutilized space in the center's cafeteria building, and a careful, critical analysis of other space allocations resulted in the availability of 17,300 square feet of records storage space and nearly 10,000 square feet of office space.

The rehabilitation of the building, dictated by the severe fire damage, will result in a building meeting the firesafety standards that the National Archives and Records Service has long advocated. Fire walls and a sprinkler system will be installed, office areas will be modernized, and additional areas of the building will be air-conditioned, including the area where the records recovered from the fire will be stored. This is especially important because although the mold spores ever present in the air are dormant as a result of the vacuum-drying process, the summer weather in St. Louis is such that reactivation could occur if the records were stored in un-air-conditioned space without proper humidity control. Alternate methods of mold control, includ-

ing sterilization, are prohibitively expensive. As a result, it will be necessary to monitor the condition of the recovered records very carefully during the next several years.

These, then, are some of the long-term problems caused by the fire, as they affect the internal operations of the center; but the most significant impact undoubtedly will be upon America's millions of veterans. Every effort has been made to lessen this impact, but there are situations today where delays occur and difficulties result. In spite of the best efforts of all concerned, cases will arise where the absence of medical records, destroyed in the fire and not available from any other source, may result in hardships. Since the resumption in October 1973 of reference service on records involved in the fire, the number of such cases has been only a small percentage of the thousands of requests received. It is hoped that both the short-term inconvenience and the long-term impact can be reduced to a minimum.

To assume that the effects of the fire will not continue to be felt in the years to come, however, would be overly optimistic. Prior to July 12, 1973, for example, 17 percent of the reference service involved requests for information from World War I records. Since more than fifty years have elapsed since the end of that war and since the fire involved records of military service as recent as 1963, it is obvious certainly, that the reference service operation will be affected for many years. Dramatically increased costs of operation are but one aspect of the fire's impact.

Not everything about the fire is negative, however, although it is easy to lose sight of this in a disaster having the scope of the one in St. Louis. We learned about the rehabilitation of fire- and water-damaged records. The vacuum-drying process proved to be eminently successful in taking sodden file folders of records and drying them so that each page could be easily separated. It was so successful, in fact, that the first records processed were too dry. Eventually the drying cycle was modified so that an acceptable level of moisture remained in the files to prevent brittleness.

We now are aware of the existence of many alternate sources of information concerning America's veterans. The millions of files maintained by the Veterans Administration are now used constantly as we seek to provide information to persons whose records were destroyed in the fire. Long unused records of draft registration from World War I now are used to document service in the armed forces. Many of the records retained by state archival agencies are proving valuable as we continue the reconstruction effort.

We will finally have a facility meeting existing firesafety standards. The rehabilitated building will have firewalls to divide the large, open records storage areas. Smoke detection and sprinkler systems will provide further protection against a repetition of the July 12 fire. Using standards developed by the General Services Administration and subsequently adopted by the National Fire Protection Association, the building will be protected as fully as it can be against fire.

As a result of the fire also, the Administrator of General Services has established the Advisory Committee for the Protection of Archives and Records Centers. This important group—headed by Wilfred I. Smith, the Dominion Archivist of Canada, and consisting of representatives from organizations such as the Society of American Archivists, the American Historical Association, the National Fire Protection Association, the Library of Congress, and the American Records Management Association—is expected to make a significant contribution to the long-sought goal of all archivists and records managers: total firesafety.