



# *BEP* History

*Papers prepared by the  
Historical Resource Center, 2004*





The mission of the Historical Resource Center is to collect, document, and preserve the history of the Bureau of Engraving and Printing and its products. The HRC serves as a resource for research and dissemination of information concerning Bureau of Engraving and Printing history and products.

This booklet consists of assorted documents prepared by the staff of the Historical Resource Center.

In this inaugural edition of historical works concerning the Bureau of Engraving and Printing, there is a brief historical narrative of the Bureau, a timeline of significant events in Bureau history, and a collection of biographies of all the Chiefs/Directors who headed the Bureau.

Our sincere hope is that the information contained in this edition will provide a better understanding and appreciation of the overall history of the Bureau of Engraving and Printing.

Future editions will include essays, studies, and other documents related to the history of the Bureau and the many items it has produced over the years.

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# TABLE OF CONTENTS

A BRIEF HISTORY . . . . .	1
ORIGINS . . . . .	2
PRODUCTION . . . . .	3
BUREAU GROWTH . . . . .	6
A BRIEF TIMELINE . . . . .	9
1800s . . . . .	10
1900s . . . . .	12
2000s . . . . .	16
DIRECTOR BIOGRAPHIES . . . . .	17





# A BRIEF HISTORY OF THE BUREAU OF ENGRAVING AND PRINTING

*Prepared by  
the Staff of the Historical Resource Center  
Bureau of Engraving and Printing  
June 2004*

A variety of sources was used to produce this Brief History. Primary sources included Bureau documents and reports contained in the files of the Historical Resource Center. Other primary sources included Treasury Department records, congressional hearings and reports, and legislative acts. A number of secondary source materials was also consulted.



View of Numbering Room, late 1800s

\$5 Demand Note, 1861, face

Spencer Clark, Chief of the First  
Division, National Currency Bureau,  
1862–1868

## ORIGINS

Faced with the growing costs of preparing for civil war in 1861, but limited in its ability to raise the required sums of money, Congress resorted to the use of paper money and authorized a general circulation of currency notes for the first time since the failed Continental Currency of the American Revolution. Such financial difficulties, precipitated by military and constitutional crises, led to the emergence of the Bureau of Engraving and Printing.

The paper notes were essentially Government IOUs, paid out in lieu of traditional coin payments, and were called Demand Notes because they were payable “on demand” in coin at certain Treasury facilities. The U.S. Government had no facility for the production of paper money in August 1861, so a private firm produced the Demand Notes in sheets of four. These sheets were then sent to the Treasury Department, where dozens of clerks signed the notes and scores of female workers cut the sheets and trimmed the notes by hand. A new issue of paper currency, called United States Notes, replaced the Demand Notes the following year. While signatures were engraved on the United States Notes, the work of placing seals on them, as well as trimming and separating, took place in the Treasury. Later in 1862, Spencer Clark, chief clerk in the Treasury Department’s Bureau of Construction, used steam-powered machines to trim and separate some of the notes. Gradually, additional work on currency and Government obligations, including engraving and printing, devolved to Clark’s operations.

Initially, the currency processing operations in the Treasury were not formally organized. When Congress created the office of Comptroller of the Currency and the National Currency Bureau in 1863 to supervise National Banks and issue National Bank Notes, Spencer Clark’s operation was nominally subordinated to that agency and designated the “First Division, National Currency Bureau.” For years, however, the currency operations were known by various semi-official labels, such as the “Printing Bureau,” “Small Note Bureau,” “Currency department,” and “Small Note Room.” Even though Clark had

advocated the creation of “The Engraving and Printing Bureau of the Treasury Department” as early as 1864, it was not until 10 years later, in 1874, that the Bureau of Engraving and Printing was officially recognized in congressional legislation with a specific allocation of operating funds for fiscal year 1875. Moreover, another 22 years passed before Congress officially established the supervisory relationship between the Secretary of the Treasury and the Director of the Bureau of Engraving and Printing in 1897. This arrangement was subsequently changed in 1981 when the United States Treasurer was assigned responsibility for oversight of the Bureau.

## PRODUCTION

At first, production of currency in the Treasury Department was limited to the final preparation of notes for issue to the public; private firms performed the actual engraving and printing. The first currency actually engraved and printed completely at the Treasury Department was the first issue of Fractional Currency in 1863, called such because the notes were in denominations of less than one dollar. It was not until 1877 that the Bureau began producing all currency for the U.S. Government. Up until that time, United States Notes (produced from 1862 to 1971) and National Bank Notes (1863–1935) had been produced privately at first and later under a shared arrangement between the Bureau and private companies. Other issues of currency produced by the Bureau have included Gold Certificates (1865–1935), Silver Certificates (1878–1964), and Treasury Coin Notes (1890–1899). Federal Reserve Notes, originally issued in 1914, are the only currency notes still being issued today.

From almost the very beginning of its operations, the Bureau designed and printed a variety of products in addition to currency. As early as 1864, it made passports for the State Department and money orders for the Post Office Department. Other early items produced by the Bureau included various Government debt instruments such as interest-bearing notes, refunding certificates, compound interest Treasury notes, and bonds. In 1866, the Bureau began printing internal revenue stamps; by around 1878, it was producing almost all revenue stamps. The production of postage stamps began in 1894, and for almost the next century the Bureau was the sole producer of postage stamps in the country.

The Bureau has produced numerous items besides currency, stamps, and securities: military commissions and award certificates; White House invitations and admission cards; and many different types

\$2 Silver Certificate, 1899, face

First Bureau Issue, 2¢ stamp with portrait of George Washington, 1894

Headpiece for Certificate of Letters Patent, Patent and Trademark Office, early 1900s





Engraving Division, 1915

Trimming 12-subject currency sheets

Examining a 32-subject currency sheet, 1961

of identification cards, certificates, and commissions for a variety of Government agencies. Additionally, during times of war or conflict, the Bureau has printed special products to include military payment certificates for American forces, Allied military currency, and postage stamps for a number of Allied countries. The Bureau has also designed or produced, in whole or part, currency for the Philippines, the Republic of Cuba, South Korea, the Kingdom of Siam, and Eritrea.

**Currency Production.** Currency has been printed primarily by the intaglio method, whereby fine-line engravings are transferred to steel plates from which an impression is made on sheets of distinctive paper. Ink is applied to the plates — each plate containing 32 note impressions — and then wiped clean, leaving ink in the engraved lines. The plate is pressed against the sheet of paper with such pressure as to actually press the paper into the lines of the plate to pick up the ink. Both faces and backs are printed in this manner, the backs being produced first. After the faces are printed, the sheets are then typographically overprinted with seals and serial numbers.

Currency was first produced at the Bureau on hand presses utilizing plates capable of printing four notes per sheet. Plate capacity on power presses increased from four to eight notes per sheet in 1918 in order to meet greatly expanded production requirements related to World War I.

With the dramatic redesign of currency in 1929 — the first major change since paper currency was first issued in 1861 — note design was not only standardized but note size was also significantly reduced. Due to this reduction in size, the Bureau was able to convert from 8-note printing plates to 12-note plates. The redesign effort came about for several reasons, chief among them a reduction in paper costs and improved counterfeit deterrence through better public recognition of currency features.

A further increase in the number of notes per sheet was realized in 1952 after breakthrough developments in the production of non-offset inks. Beginning in 1943, the Bureau experimented with new inks that dried faster, therefore obviating the need to place tissues between sheets to prevent ink from offsetting to other sheets. The faster drying ink also enabled printed sheets of backs to be kept damp until the faces were printed, thereby reducing distortion caused by wetting, drying, and re-wetting of the paper (sheets needed to be dampened before each printing).

By reducing the distortion that increases proportionally with the size of the sheet of paper, the Bureau was able to convert from 12-note printing plates to plates capable of printing 18 notes in 1952. Five years later in 1957, the Bureau began printing currency via the dry intaglio method



that utilizes special paper and non-offset inks, enabling a further increase from 18 to 32 notes per sheet. Since 1968, all currency has been printed by means of the dry intaglio process, whereby wetting of the paper prior to printing is unnecessary.

In the early 1990s, the Bureau produced some currency on a web-fed rotary press. Using a roll of paper instead of sheets, the new press printed both sides of the notes in a single pass. Considered the next generation of printing technology, the press was used until 1995, but because it was unable to sustain the long production runs for which it was intended, its use was discontinued.

The next major change in currency came in 1991 when the Bureau added microprinting and translucent security threads as advanced counterfeit deterrents. Just 5 years later, in 1996, currency notes underwent the most significant redesign since 1929. Besides microprinting and security threads, the new notes featured a larger off-center portrait, watermark, color-shifting ink, and concentric fine-line printing, all in an effort to address counterfeiting threats posed by advances in color reproduction equipment and processes.

Currency underwent another noteworthy change in October 2003. Series 2004 notes were the first to feature subtle background colors that added complexity to the note, making counterfeiting even more difficult. The offset printing method was used to apply background color to these new notes. This marks the first time that the production of U.S. currency included offset printing in addition to traditional intaglio printing.

**Other Production.** While currency production has primarily utilized the intaglio method of printing, the Bureau has used assorted printing methods for its other products. For example, postage stamps have been produced using intaglio, gravure, and a combination of intaglio and offset methods. Gravure printing consists of a pattern of tiny etched dots on the printing plate. Ink held inside the tiny dots is lifted up when paper is pressed against the plate, as in the intaglio method. In offset production, the image is lifted off the printing plate onto a rubber blanket by means of chemical attraction/repulsion and then offset to the paper.

At different times throughout its history, the Bureau has adjusted its production methods to meet new challenges. For instance, to fulfill increased production requirements without reverting to overtime, the Bureau started producing internal revenue stamps in the 1890s using the faster method of relief printing. Later, in 1912, the Bureau started using offset presses to produce checks, certificates, and other miscellaneous items to reduce production costs.

Engraving the New Currency Design  
\$100, Series 1996

Postage stamp production

Offset press, Surface Printing Division,  
1953



## BUREAU GROWTH

From the very beginning of Government currency operations, space has been a perennial concern. The first home of the nascent Bureau of Engraving and Printing was the Treasury Department located at 1500 Pennsylvania Avenue next to the White House. From 1861 until 1880, the work of engraving, printing, and processing securities was completed in a variety of rooms in the Treasury Building, including the basement and attic, where a dumbwaiter was used to transport paper and printed materials between the two locations. As early as 1864, Spencer Clark — in effect, the first head of Government currency production — recommended to the Treasury Secretary that a fireproof building be built for the express purpose of printing currency and other securities of the United States. In addition to safety concerns, the need for a separate facility also grew out of the disruption that the Bureau's industrial operations brought to other offices within the Treasury.

However, it was not until 1878 that Congress appropriated funds for construction of a separate building. A section of land on the southwest corner of 14th and B Streets, owned by William W. Corcoran, banker and founder of the Corcoran Gallery of Art in Washington, DC, was purchased in 1878. James G. Hill, then Supervising Architect of the Treasury, designed the Bureau's first building. The concrete foundation was poured in September 1878 and construction was completed in 1880 at a cost of \$300,000. Later designated the Auditors' Building after Bureau operations moved in 1914, the structure is Romanesque in style, constructed with rolled iron girders and pressed brick that is dark red in color. Upon completion, it was 220 feet long and 135 feet wide with four stories, a basement, a sub-basement, and a tower. In the tower, there was to be a clock, but it was never installed.

Over the next 30 years, the facility underwent many renovations to meet the growing need for currency and other Government obligations attendant with the country's enormous economic growth. Extensions were constructed, additional land was acquired, and outbuildings were erected. By 1906, expansion of the facility had reached its limit and several plans for a larger facility were put forth. Eventually, it was decided that a new building would be constructed between 14th and 15th Streets, just south of the existing facility. Congress appropriated a total of \$2,300,000 toward the purchase of land and construction. James Knox Taylor was supervising architect and J. Henry Miller, Inc. of Baltimore, Maryland, was the construction firm. The building was completed in February 1914 at a cost of \$2,882,000.

The architectural style of what is now considered the main building of the Bureau of Engraving and Printing is neoclassical. It has a steel



Bureau of Engraving and Printing,  
1880 building

Bureau of Engraving and Printing,  
main building

Bureau of Engraving and Printing,  
main building

superstructure with fireproof concrete, Indiana limestone, and granite trim exterior. The main façade of the building faces Raoul Wallenberg Place, the Tidal Basin, and the Jefferson Memorial, with stone columns spanning the 505-foot length of the building's front. The building is 296 feet deep and 105 feet high with four wings that extend back toward 14th Street. There are four floors, a basement, and a fifth-floor attic that houses a cafeteria and offices — all told, it takes up 5 acres of land and contains almost 10 acres of floor space.

Bureau growth continued through the years. Employment hit an all-time high of 8,432 in November 1918 due in large part to the enormous production requirements related to World War I financing operations. To accommodate these increases in personnel and activities, several temporary outbuildings were constructed. As early as the mid-1920s, the Bureau had called for the construction of another permanent facility, as further expansion of the main building was impractical. In August 1935, Congress provided the first appropriation of money for land and construction of an additional building on 14th Street between C and D Streets, opposite the main building. After extensive plans were drawn up and site preparation was accomplished, the first concrete was poured in June 1936. Completed at a cost of \$6,325,000, Bureau personnel moved into the annex building on 17 May 1938, and the building was officially dedicated in November 1938.

The architect of the annex was Louis M. Simon, and John McShain, Inc. and Sons of Philadelphia handled construction. The building is 570 feet long and 285 feet wide, occupies almost 4 acres of land, and contains over 19 acres of floor space. Due to a shortage of funds, the building was made of reinforced concrete with a limestone façade. It contains 6,400 tons of reinforced steel, 1,340 tons of structural steel, and 139,968 tons of concrete. At the time it was built, it was believed to be the second largest building constructed with reinforced concrete. The exterior is derived from the simple design of early Federal buildings with little ornamentation. The structure consists of a central “backbone” running from 14th Street to 13th Street with five wings extending north and south from the backbone. The sub-basement, basement, first floor, and second floor cover the entire footprint while the third through seventh floors, attic, and penthouse extend over the wings. Beneath the building are two tunnels, one that connects with the main building and one with a freight-receiving building and spur line of railroad tracks to the south, though the tracks are no longer in use. Other offices of the Treasury Department were housed in the annex building until the 1990s.

The need for additional space again became evident in the early 1970s, and over the next decade a number of studies and plans were made for

Bureau of Engraving and Printing, annex building, under construction, 1937

Bureau of Engraving and Printing, annex building

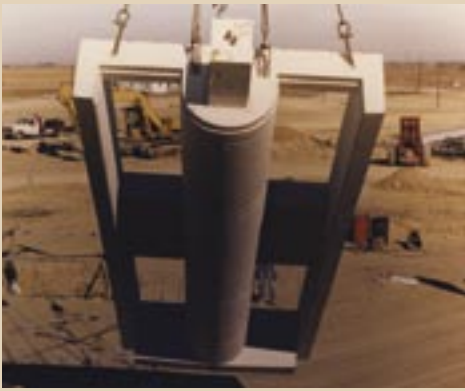
Bureau of Engraving and Printing, annex building entrance



construction of a new facility. Finally, in 1985, the Bureau began a site search for a satellite operating facility west of the Mississippi River. In addition to meeting increased production requirements, a western location was seen to serve as a contingency operation in case of emergencies in the DC metropolitan area; additionally, costs for transporting currency to Federal Reserve banks in San Francisco, Dallas, and Kansas City would be reduced. Of the 83 cities that responded to initial solicitations from the Bureau, 11 were asked to submit no-cost proposals. In November 1986, the City of Fort Worth, Texas, was chosen to host the Bureau of Engraving and Printing's Western Currency Facility.

In 1987, the city completed site preparation, made property improvements, and constructed the building "shell" and Federal Reserve vault. The State of Texas contributed to the project with major road improvements, and Texas Utilities extended electrical services to the facility. The architectural engineering firm of Kirk, Voich & Gist, Inc., was the supervising architect and the Walker Construction Company of Fort Worth performed the work. Upon completion of the exterior, the Bureau contracted with the Army Corps of Engineers for design review and contract administration for the interior portion of the project, with Clearwater Construction, Inc., responsible for interior construction. The single-story facility, which sits on 100 acres of land donated by the City of Fort Worth, has more than 12 acres of floor space. Currency production began in December 1990 and the official dedication took place on 26 April 1991. Soon after initial currency production began, additional press and processing equipment was installed under a phased, multi-year approach. There were also modifications and upgrades to facility support functions, as well as some additions to the facility. In April 2004, a new Visitor Center opened, which offers a public tour of the currency manufacturing process.

From several scattered offices in the Treasury Building to three large production plants in two cities, from trimming and cutting sheets of Demand Notes to engraving and printing all United States currency as well as myriad documents and products for many Federal agencies, the long history of the Bureau of Engraving and Printing has been characterized by challenge, innovation, and success in meeting the needs of the nation.



Western Currency Facility,  
under construction, late 1980s

Western Currency Facility, circa 1987–  
1991

Western Currency Facility, atrium, 1991



# A BRIEF TIMELINE OF BEP HISTORY

*Prepared by Michael Scalia  
for the Historical Resource Center  
Bureau of Engraving and Printing  
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The following pages contain a timeline of significant events in Bureau of Engraving and Printing history.

The Bureau has been in existence for over 140 years. It would be extremely difficult to include all the important and interesting events that have occurred over such a long period. Instead, noteworthy firsts as well as milestone events have been chosen to provide a well-rounded timeline of Bureau history.

A variety of sources was used to compile this timeline, including annual reports, order books, and other Bureau documents contained in the files of the Historical Resource Center. Other primary sources included Treasury Department records, congressional hearings and reports, and legislative acts.

A number of secondary source materials was also consulted.



Spider press with plate printer and printer's assistant, 1902–1914

July 17, 1861

The Secretary of the Treasury is authorized to issue paper currency in lieu of coin due to the lack of funds needed to finance the Civil War. Basically Government IOUs, the currency notes are called Demand Notes because they are payable upon demand in coin.

August 1861

Sheets of Demand Notes, printed by a private firm, are delivered to the Treasury Department where scores of clerks sign, separate, and trim the notes by hand before issuance to the public.

circa April 1862

Presses are used in the Treasury Department to overprint seals on a new issue of currency called United States Notes. Designated the first legal tender paper money, the United States Notes are printed by private firms and then sent to the Treasury for final processing before issuance.

July 11, 1862

Legislation authorizes the Treasury Secretary to engrave and print notes at the Treasury. (Though such work did not immediately begin, the act is viewed as the enabling legislation for work performed by the Bureau of Engraving and Printing.)

August 1862

Steam-powered machines are used to trim and separate some notes. The effort is led by Spencer Clark, chief clerk in the Treasury Department's Bureau of Construction, who would later head the Bureau of Engraving and Printing.

circa March 1863

Currency processing operations in the Treasury are nominally placed under the Comptroller of the Currency who heads the National Currency Bureau; as a result, Spencer Clark's operations are called the "First Division" of the National Currency Bureau.

June 1863

Government securities — coupon bonds popularly known as "five twenties" after the minimum and maximum years of redemption — are the first items produced by the First Division.

Work begins on the production of Fractional Currency notes, called such because they are in denominations under one dollar. Issued later in October 1863, it is the first currency engraved and printed completely by the First Division.

circa July 1863

Items other than currency or Government obligations, such as passports for the State Department, are produced by the First Division.

circa November 1864

Revenue stamps are produced by the First Division. By this time, the operation is known by a variety of semi-official names, including “Bureau of Engraving and Printing.”

circa March 1866

United States Notes are printed for the first time by the Bureau, but only partially. Previously, private firms produced the notes, and only the seals were printed by the Bureau.

July 1869

The Bureau participates for the first time in an international exposition at Vienna, Austria, exhibiting a display frame of engravings which garners a medal for excellence.

May-November 1873

Congress passes an appropriations bill that allocates money to the “Bureau of Engraving and Printing.” It is the first specific appropriation of funds to the Bureau.

June 20, 1874

Legislation directs the Internal Revenue Service to procure stamps engraved and printed at the Bureau of Engraving and Printing, provided costs do not exceed that of private firms. As a result, the Bureau begins producing almost all revenue stamps in fiscal year 1878.

August 15, 1876

In an appropriations bill, Congress mandates that the engraving and printing of notes, bonds, and other securities of the United States be performed at the Treasury Department, provided the work can be done as cheaply, safely, and perfectly as work by private firms.

March 3, 1877

The Bureau begins producing all United States Notes and National Bank currency without outside help. Previously, private firms had been contracted for some of the production.

October 1, 1877

The “Milligan press,” a steam-powered printing press, is brought into the Bureau. Power presses are initially used for partial currency production as well as revenue stamps.

January 30, 1878

The first building constructed specifically for Bureau operations is completed at the corner of 14th Street and B Street (Independence Avenue). Since 1861, currency operations had been accomplished in various rooms of the Treasury Department.

July 1, 1880



Stickney press, 1912–1914

July 1, 1889

The use of automated intaglio printing presses ceases. The move results from legislation that drastically reduces royalty payments to patent holders of the presses. Rather than accept the low royalty, the patent holders withdraw permission to use the presses.

circa August 1891

Some internal revenue stamps are produced by relief printing for the first time.

April 1894

Automated intaglio printing presses are re-introduced to the Bureau to produce postage stamps. The presses are bought outright, thereby avoiding previously mandated patent royalty rates. Because stamp production previously had been accomplished in the private sector on power presses, the Bureau's use of them is not contested by organized labor.

July 1, 1894

The agreement between the Postmaster General and the Treasury Secretary for the Bureau to produce all postage stamps goes into effect. The first stamp printed by the Bureau, the 6-cent "President Garfield" regular issue, goes on sale July 18th.

June 4, 1897

Legislation is passed that formally subordinates the Director of the Bureau to the Treasury Secretary, the first official legislation regarding the organization of the Bureau since work first began on paper currency in 1861.

March 3, 1899

The use of automated printing presses is again restricted by legislation, this time in the production of revenue stamps.

March 1903

The Bureau begins production of currency notes for the Philippines. The Bureau would later produce or design, in whole or part, currency for Cuba (1935), Siam (1946), South Korea (1947), and Eritrea (1994).

March 1907

Legislation repeals the prohibition on the use of automated printing presses for the production of revenue stamps.

August 26, 1912

The Bureau begins using automated presses again for the partial production of currency. Since 1898, various legislative acts restricted the use of automated presses for currency production.



<p>Offset printing, whereby images are first taken up on rubber-coated cylinders and then transferred or offset to the paper, is first used in the Bureau for the production of checks, certificates, and other miscellaneous items.</p>	<p>Fiscal Year 1913</p>
<p>Construction is completed on a new building for the Bureau. Facing 15th Street, it is known as the main building.</p>	<p>February 1914</p>
<p>The “Stickney press,” the world’s first rotary web-fed intaglio press, begins producing postage stamps. Created by the Bureau’s mechanical designer Benjamin Stickney, financed by the Bureau and Post Office Department, and tested for over 2 years, the breakthrough press performs printing, gumming, and perforation in one continuous operation using rolls of paper.</p>	<p>April 1914</p>
<p>The Bureau begins printing Federal Reserve Notes.</p>	<p>October 28, 1914</p>
<p>Currency is first produced from plates that print 8 notes per sheet, a doubling of the usual 4 notes per sheet on power presses. The change is made to meet expanded production requirements related to the financing of World War I costs.</p>	<p>July 26, 1918</p>
<p>The number of Bureau employees peaks at 8,432. The dramatic increase in production results from war finance measures instituted upon America’s entry into World War I.</p>	<p>November 7, 1918</p>
<p>The Bureau begins making printing plates using the electrodeposition method, whereby engraved steel plates are layered with nickel and copper by electrolysis to form an exact replica in reverse. The reverse replica plate is then processed the same way to produce a finished plate.</p>	<p>April 1920</p>
<p>Devised by the Engraving Division Superintendent, the process enables the Bureau to produce printing plates faster and cheaper than the traditional transfer method.</p>	
<p>After the Bureau sells its last horse, Bureau transportation is completely mechanized with electric and gasoline vehicles.</p>	<p>July 1, 1920</p>
<p>Legislation repeals all prohibitions on the use of automated printing presses for the production of currency.</p>	<p>January 3, 1923</p>
<p>The “high-etch” process of plate making is conceived and perfected by Bureau personnel. A genuine contribution to the graphic arts industry, the new method is a photomechanical process that etches the background of a design rather than the design itself.</p>	<p>Fiscal Year 1925</p>



Flatbed power press, 1949–1953

July 1929

In the most dramatic development since paper currency was first put into circulation in 1861, small-sized currency notes with standardized designs are issued. The reduced size of the note, adopted in part to cut paper costs, enables the Bureau to convert from 8 to 12 notes per sheet.

August 7, 1929

Production of large-sized National Bank Notes on hand presses ceases. As a result, the hand press section is closed, and the presses are dismantled and sold.

February 5, 1935

The first stamps perforated by means of an electric-eye perforator are delivered to the Post Office Department. The electric eye reads marks on the paper and automatically adjusts printing registration, thereby minimizing manual adjustment and reducing spoilage due to inaccurate perforation.

May 17, 1938

The Bureau begins operations in a new annex building located on 14th and C Streets, across from the main building.

June 1943

The Bureau starts producing Allied military currency for use by Allied invasion forces in Italy. Along with private and other Government agencies, the Bureau would design or produce such currency, in part or whole, for use in Austria, Germany, France, and Japan.

July 1943

Production begins on Allied military postage stamps. In all, the Bureau would supply stamps for use in Italy, France, Germany, and Austria.

October 20, 1950

A faster drying green ink developed by the Bureau is first used to print currency backs. Because the ink no longer offsets from one sheet to another, drying and rewetting production steps are eliminated.

July 1, 1951

The Bureau begins to operate on a reimbursable basis in accordance with a legislative mandate to convert to business-type accounting methods. As a result, annual congressional appropriations cease.

A faster drying black ink is formulated by the Bureau for currency faces. Like the green non-offset ink previously developed by the Bureau, the new black ink permits the elimination of several production steps.

July 1952

Additionally, distortion due to drying and wetting steps is reduced, enabling the use of a larger sheet of paper. As a result, the conversion to plates with 18 notes instead of 12 begins the next month.

Legislation directs that the inscription “In God We Trust” be placed on all United States currency.

July 11, 1955

Currency is first produced on 32-subject plates. The larger printing plates are made possible by the electrodeposition method of plate-making, as the traditional transfer process proves impracticable for making plates containing so many impressions.

July 1957

The first notes bearing the national motto “In God We Trust” are issued, \$1 Silver Certificates, Series 1957. They are also the first notes produced on new high-speed rotary presses using the dry intaglio process which is faster than the traditional method that required wetting of the paper. The complete conversion from wet to dry printing of currency comes in 1968.

October 15, 1957

Prototype currency overprinting and processing equipment (COPE) is installed. Conceived by Bureau personnel and custom built to Bureau specifications, the equipment mechanizes currency finishing operations.

circa 1972

Water wipable inks are formulated for web- and sheet-fed intaglio presses. First used in postage stamp production, the new inks eliminate the use of hazardous solvents and wiping paper for removing excess ink from printing plates.

circa 1977

The Bureau initiates a site feasibility study for a new currency production facility west of the Mississippi River. The facility is intended to better meet the currency needs of the western half of the nation and act as a contingency production operation. From the 83 cities that respond to the initial solicitation, Fort Worth, Texas, is chosen as the site in November 1986.

May 1985

The Bureau’s Western Currency Facility in Fort Worth, Texas, begins producing currency. It is the first Government facility outside of Washington, DC, to print United States paper money.

December 1990



Web currency press, 1990–1995

March 1991

\$100 Federal Reserve Notes are produced that contain microprinting and an embedded security thread. The new features, which are later integrated into other denominations, are aimed at deterring counterfeiting via advanced color copying equipment widely available to the public.

July 1992

The first currency notes produced on a web-fed rotary press are issued. Using a roll of paper instead of sheets, the press prints both sides of the notes in a single pass. The press is used until 1995 but because it is unable to sustain the long production runs for which it was intended, it is discontinued.

March 25, 1996

Redesigned Federal Reserve Notes with multiple advanced counterfeit deterrent features are issued beginning with the \$100 denomination. Intended to thwart technological advances available to counterfeiters, the new designs and features represent the most dramatic change in currency since the introduction of small-sized notes in 1929.

circa 1997

An electronic inspection system is implemented for currency and postage stamps. The new technology builds upon the mechanical inspection process put into place in 1982.

June 14, 2000

The Bureau is awarded certification from the International Organization of Standardization for its currency manufacturing quality management system.

October 9, 2003

Federal Reserve Notes with subtle background colors and improved security features are first issued.

April 26, 2004

The Bureau's Western Currency Facility opens a Visitor Center and public tour of the currency manufacturing operations.



**BRIEF BIOGRAPHIES**  
**OF BEP DIRECTORS**

*Prepared by Michael Scalia  
for the Historical Resource Center  
Bureau of Engraving and Printing  
June 2004*

## **SPENCER M. CLARK** (1811–1890)

**Chief of First Division, National Currency Bureau  
circa 1862–1868**



Spencer Clark was a native of Vermont. He was involved in a variety of business activities until 1856 when he became a clerk in the Bureau of Construction of the Treasury Department in Washington, DC. Later, as acting engineer, Clark became interested in the work of finishing new currency notes at the Treasury and gradually assumed increasingly greater responsibilities in the engraving, printing, and processing of U.S. Government currency and securities. A strong advocate for a distinct bureau within the Treasury Department for the production of currency and securities, Clark was essentially the first head of the Bureau of Engraving and Printing. He resigned in 1868 amidst a congressional investigation into record-keeping and security within the fledgling currency operations at the Treasury. Clark went on to work at the Department of Agriculture in the Statistical Division. He later headed the Bureau of Vital Statistics in the Agriculture Department until his death in 1890.

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## **GEORGE B. McCARTEE** (1832–1903)

**Chief, Bureau of Engraving and Printing  
1869–1876**



George McCartee was born and raised in New York City. He engaged in business pursuits there, later worked as a railway superintendent in Iowa, and in 1858 moved to Salem, New York, where he was an agent and manager of a steam mill. In 1859, McCartee went to Washington, DC, as the private secretary to the Secretary of the Treasury. He held other positions in the Treasury, including superintendent of the Treasury Building, and he also went abroad during the Civil War to negotiate the sale of Government bonds. In 1868, McCartee was made Acting Chief of the “Engraving and Printing Bureau” after a congressional investigation into the currency operations forced Spencer Clark’s resignation from the Treasury. McCartee was officially put in charge of the developing Bureau of Engraving and Printing in 1869. After serving more than 6 years as Chief, he resigned, citing ill health. In later years, while back in Salem, McCartee tried in vain to secure reappointment as the Chief of the Bureau of Engraving and Printing. He managed the *Salem Press* newspaper and stayed active in local politics, gaining appointment as Paymaster of the Capitol at Albany, New York. McCartee died at the age of 70 in Salem, New York.

## **HENRY C. JEWELL** (1827–1908)

**Chief, Bureau of Engraving and Printing**  
1876–1877

Henry Jewell was born and raised in Georgetown in the District of Columbia. He attended local seminaries as well as school in New York and later entered the United States Navy as an engineer. While in the Navy, Jewell helped survey the Pacific coast. After leaving the Navy, he worked as chief accountant for a private banking firm. Later, as a bookkeeper for the Bureau of Engraving and Printing, Jewell was responsible for revamping the agency's accounting system. He was appointed Chief of the Bureau in 1876 but served just over a year. A prominent citizen of the District of Columbia, Jewell was reportedly close to many leading public figures, including Presidents Grant and Hayes. Jewell died at the age of 80 in Georgetown.



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## **EDWARD McPHERSON** (1830–1895)

**Chief, Bureau of Engraving and Printing**  
1877–1878

Edward McPherson was born and raised in Gettysburg, Pennsylvania. He graduated from Pennsylvania College in 1848. Afterwards, McPherson studied law and edited several Pennsylvania city newspapers. He was elected to the United States House of Representatives in 1858 and served in the 36th and 37th Congresses. In 1863, McPherson became Deputy Commissioner of Internal Revenue, and later that same year he was appointed the Clerk of the House of Representatives, a position in which he served until 1875. McPherson was Chief of the Bureau of Engraving and Printing from 1877 to 1878. Later, from 1881 to 1883, he again served as Clerk of the House of Representatives and from 1889 to 1891 as well. He was editor of several publications from 1877 to 1895, and from 1880 until his death in 1895 he was editor and proprietor of a Gettysburg, Pennsylvania, newspaper. McPherson also authored political handbooks and histories of the United States dealing with the Civil War and Reconstruction periods.



### **O. H. IRISH** (1830–1883)

**Chief, Bureau of Engraving and Printing**  
1878–1883



Orsamus H. Irish was a native of New York. He attended school in Erie, Pennsylvania. In 1857, Irish moved to Nebraska where he later became the editor and owner of a newspaper in Nebraska City. He was later made an Indian Agent at the Omaha Reservation in 1861, and in 1864 he was appointed Superintendent of Indian Affairs for the Northwest with offices at Salt Lake City, Utah. In 1866, Irish returned to Nebraska, where he served as internal revenue collector for Nebraska and again took up the newspaper business. Irish was very active in politics, the Masons, and various other causes; he also practiced law and was involved in the railroad business. In 1869, he was appointed United States Consul at Dresden, Germany. Returning to Nebraska in 1873, he entered into a nursery business, but in 1875, the nursery was wiped out by grasshoppers. Irish then moved to Washington, DC, to practice law. He was appointed Assistant Chief of the Bureau of Engraving and Printing in 1877. The next year, Irish became Chief of the Bureau and served in that position until his sudden death at age 53.

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### **TRUMAN N. BURRILL** (1832–1896)

**Chief, Bureau of Engraving and Printing**  
1883–1885



Truman Burrill was born and raised in Elbridge, New York. In the 1850s, he and his brother operated a dry goods and clothing store in Penn Yan, New York. With the Civil War underway, Burrill formed and headed an infantry company from New York in 1862, serving until he was discharged for a physical disability in 1863. He was again commissioned as a captain in 1864 and served on the staffs of several commanding officers as a commissary officer. After his discharge from the military in 1866, Burrill worked in the furniture-making business in both Rochester and Buffalo, New York. He entered the Bureau of Engraving and Printing as a storekeeper in 1880 and later was made clerk in charge of proposals and supplies. From this position, Burrill was appointed Chief in 1883 after the sudden death of O.H. Irish, passing over the Assistant Chief and others closer in line for promotion to the top spot. He served for just over 2 years. After leaving the Bureau, Burrill followed various pursuits until his death in New York City in 1896.



## **EDWARD O. GRAVES** (1843–1909)

**Chief, Bureau of Engraving and Printing**  
1885–1889

Edward Graves was born in Gravesville, New York. After graduating from Hobart College (now the Hobart and William Smith Colleges) in Geneva, New York, in 1863, he received an appointment as a clerk in the Treasury Department. He was made Chief Clerk in the Treasurer's office in 1868. Graves also served as Chief Examiner of the U.S. Civil Service Commission during which time he instituted new procedures for the examination and appointment of candidates across the country for Government positions. He was appointed Superintendent of the National Bank Redemption Bureau of the Treasury Department in 1874 and was selected by the Treasury Secretary to investigate the efficiency, organization, and management of the Bureau of Engraving and Printing as part of a special committee in 1877. Graves later served as Assistant Treasurer for 2 years before his appointment as Chief of the Bureau of Engraving and Printing in 1885. Upon his resignation from the Bureau, Graves became president of a bank in Seattle, Washington, where he lived until his death at age 65.



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## **WILLIAM M. MEREDITH** (1835–1917)

**Chief, Bureau of Engraving and Printing**  
1889–1893 & 1900–1906

William Meredith was born in Centreville, Indiana. He attended school, including a year in college, but left to work in his father's printing office. Meredith went on to work at the Indianapolis *Journal* newspaper. At the outbreak of the Civil War, he enlisted in the Army but shortly afterwards he was appointed by the Indiana governor to the military post of state commissary-general. Later, in 1862, Meredith formed a company of volunteers made up mostly of printers and was selected as its captain. He served with the company until 1864 when he was discharged for service-related injuries. After the war, Meredith worked as a printer in several cities, becoming foreman at newspapers in Indianapolis and St. Louis. In 1875, he began work at the Western Bank Note Company in Chicago as superintendent of plate printing. He was appointed Chief of the Bureau of Engraving and Printing in 1889 largely through his association with President Benjamin Harrison, under whom Meredith had served in the Army during the Civil War. After leaving the Bureau in 1893, he returned to the Western Bank Note Company. He was appointed Chief of the Bureau a second time in 1900, making Meredith the only person to hold the top position twice. He left the Bureau in 1906, assuming another position within the Treasury Department, where he remained until his death at age 82.



### **CLAUDE M. JOHNSON** (1852–1919)

**Director, Bureau of Engraving and Printing  
1893–1900**



Claude Johnson was born in Lexington, Kentucky, and he attended school there and in New York. After returning to Lexington, Johnson worked in the drug business and grocery trade. He was also involved in local politics, winning election to the city council and serving as mayor for 8 years from 1880 to 1888. Johnson's appointment as Director of the Bureau of Engraving and Printing was due in large part to his affiliation with Treasury Secretary John G. Carlisle, a fellow Kentuckian. He was Director for 7 years, during which time the Bureau assumed the production of all United States postage stamps. It was also during his tenure that the title of Chief was changed to Director, at Johnson's urging, to distinguish the Bureau head from the other chiefs of the various divisions within the organization. He later served as a United States Indian Agent in Arizona and headed a printing establishment in England. Johnson died in Lexington, Kentucky, at the age of 66.

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### **THOMAS J. SULLIVAN** (1845–1908)

**Director, Bureau of Engraving and Printing  
1906–1908**



Thomas Sullivan was born in Washington, DC, and lived there all his life. After attending public and private secondary schools, Sullivan received bachelor's and master's degrees in law from Georgetown University. He worked as a bookkeeper for a private banking firm and as a clerk in the Bureau of Refugees, Freedmen, and Abandoned Lands. Sullivan entered the Bureau of Engraving and Printing in 1869 as an accountant, becoming principal accountant in 1872. He became Assistant Chief in 1882 and served in that capacity for almost 25 years before appointment as Director of the Bureau in 1906. Less than 2 years later, while still serving as Director, Sullivan died of pneumonia at the age of 62.

## **JOSEPH E. RALPH** (1863–1922)

**Director, Bureau of Engraving and Printing**  
1908–1917

Joseph Ralph was born in Pennsylvania and raised in Joliet, Illinois. After school, he apprenticed in a steel works machine shop, eventually becoming an expert mechanic. Ralph was also prominent in union and political activities, which led to his appointment as Assistant Postmaster of the House of Representatives. He was later selected as Superintendent of Construction at Ellis Island, New York, and in 1892 he was named Deputy Collector for the Customs Department at the Chicago World's Fair. Ralph first worked in the Bureau of Engraving and Printing as a plate cleaner in 1895 and then as the Custodian of Dies and Rolls in 1897. In 1906 he was appointed Assistant Director and upon the sudden death of Thomas Sullivan in 1908, he was chosen as Director. During his tenure, Ralph oversaw the construction of the Bureau's new facility on 15th Street that opened in 1914 and still serves as the Bureau's main building. Although he resigned from the Bureau in 1917 to head a new banknote company, Ralph eventually went on to become the assistant to the president of the United States Steel Corporation. He died suddenly at age 59.



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## **JAMES L. WILMETH** (1870–1959)

**Director, Bureau of Engraving and Printing**  
1917–1922

James Wilmeth was born in Chewallah, Tennessee, and he was raised there and in Arkansas. He attended college in Arkansas and taught public school for several years prior to joining the Treasury Department as a clerk in 1895. While working at the Treasury, he earned a Bachelor of Law degree from the National University in Washington, DC. Wilmeth became Assistant Chief of the Money Order Division and was later a law clerk in the Office of the Comptroller of the Treasury. In 1910, he served as Chief Clerk of the Treasury and worked in Europe as the Custodian of Gold before his appointment as Director of the Bureau of Engraving and Printing in 1917. Wilmeth was dismissed by Presidential executive order along with 28 other top Bureau officials in 1922 as a result of controversial charges involving the improper duplication of bonds. Later exonerated of wrongdoing and offered reinstatement to the Director position in 1924, Wilmeth declined the appointment. After leaving the Bureau, he worked for an insurance firm, served as National Secretary of the Junior Order of American Mechanics, and won election to the office of mayor in Takoma Park, Maryland. Wilmeth later moved to Philadelphia, Pennsylvania, where he lived until his death at age 88.



### **LOUIS A. HILL** (1865–1933)

**Director, Bureau of Engraving and Printing**  
1922–1924



Louis Hill was born in Boston, Massachusetts, and attended Columbian University (now The George Washington University) in Washington, DC. He worked as an engraver in Philadelphia before beginning work at the Bureau of Engraving and Printing in 1900. (Hill's father, John R. Hill, also worked as an engraver at the Bureau for over 30 years, from 1882 to 1913.) He became the Assistant Chief of the Engraving Division in 1913. As a result of President Harding's surprise executive order dismissing Director James Wilmeth and 28 other top officials from the Bureau, Hill was elevated to the Director's position in 1922. He served for about 2 years but resigned to allow Wilmeth, who had been exonerated and offered reappointment, to return as Director. Despite Wilmeth's refusal to return, Hill let his resignation stand. Little is known of Hill after his departure from the Bureau in 1924 until his death in 1933 in Washington, DC.

### **MAJOR WALLACE W. KIRBY** (1881–1962)

**Director, Bureau of Engraving and Printing**  
1924



Wallace Kirby was a native of Washington, DC. After attending school, he went into the printing business. Kirby entered Government service in 1900, working for the U.S. Geological Survey. When the United States entered World War I, he was commissioned as an Army officer and assigned to the Corps of Engineers, where he was responsible for map reproduction activities for the Army. While serving with expeditionary forces in France, Kirby commanded the 29th Engineers, a unit of experts in surveying and map-making. In February 1924, he was detailed by President Coolidge to head the Bureau of Engraving and Printing after Director Louis Hill resigned; however, because a military officer could not hold a civilian position, Congress passed a joint resolution that enabled Kirby to serve for 6 months while still a commissioned officer. At the end of his special term as Director, he returned to the Army's Engineer Reproduction Plant in Washington. Later, in 1927, Kirby started a printing company — still in operation today in Arlington, Virginia — that he headed until his death at age 81. Additionally, he was a founding member of the National Association of Photo-Lithographers (which evolved into the National Association for Printing Leadership). Kirby is unique in that he was the only active duty military officer ever to serve as Director of the Bureau of Engraving and Printing and the only Director appointed by an act of Congress. He also has the distinction of serving the shortest amount of time as Director.

**ALVIN W. HALL** (1888–1969)

**Director, Bureau of Engraving and Printing**  
1924–1954

Alvin Hall was born and raised in Harleigh, Pennsylvania. He received a Bachelor of Law degree from National University in Washington, DC, and worked as an accountant and auditor in the private sector before entering Government service as an accountant in the Bureau of Army Ordnance in the War Department. In 1920, he became an investigator for the U.S. Bureau of Efficiency and conducted efficiency studies in many Government agencies. Hall was assigned to a special committee tasked by Treasury Secretary Andrew Mellon to survey procedures in the Bureau of Engraving and Printing in 1922. His participation on that committee led to his appointment as head of the Bureau's planning unit and later as Director in 1924. Only 36 years old at the time of his appointment, Hall was the youngest Bureau Director, and he held the top spot for 30 years – far longer than any other Bureau head. During his tenure, he oversaw many technological advances and changes in production, most notably the conversion to small-sized, standardized currency notes in 1929 and the development of non-offset inks in the early 1950s. Hall died in 1969 in Washington at the age of 80.



**HENRY J. HOLTZCLAW** (1897–1969)

**Director, Bureau of Engraving and Printing**  
1954–1967

Henry Holtzclaw was born in Virginia and attended school in the District of Columbia. He began at the Bureau of Engraving and Printing as a machinist's helper in 1917. Although he had little formal schooling, Holtzclaw rose to become the Bureau's designated mechanical expert and designer in 1931 and later, when that position expanded into the Office of Research and Development Engineering, he served as its first head. As the mechanical expert for the Bureau, Holtzclaw was primarily responsible for developing the electric eye perforator in the 1930s. In 1949, he became Assistant Director and in 1954 he was appointed Director. Holtzclaw served as Director for 13 years, the second longest tenure of any Bureau head. He died at age 71, a little more than a year after retiring from the Bureau of Engraving and Printing and completing 50 years of Government service.



**JAMES A. CONLON** (1921–2000)

**Director, Bureau of Engraving and Printing**  
1967–1977



James Conlon was born and raised in New York City. He joined the Bureau in 1942 as an apprentice plate printer and, after military service in World War II, served in increasingly higher positions of responsibility, including head of the Quality Control Branch, Assistant Chief and later Chief of the Office of Currency and Stamp Manufacturing, Assistant Director of the Bureau, and then Deputy Director until his appointment as Director in 1967. During Conlon's decade-long tenure as Director, significant improvements were made in Bureau production methods, such as the procurement of high-speed, sheet-fed currency presses; installation of prototype currency overprinting and processing equipment; and the acquisition of advanced gravure, intaglio, and gravure/intaglio combination presses for printing multicolor postage stamps. Conlon entered the private sector upon retirement from Government service in 1977. He died in 2000 at the age of 79.

**SEYMOUR BERRY** (1922– )

**Director, Bureau of Engraving and Printing**  
1977–1979



Seymour Berry was born and raised in New York City. Not long after completing high school, he began a plate printer apprenticeship with the Bureau of Engraving and Printing in 1942. Within a short time, however, Berry went into the Army and served as an infantryman in Europe during World War II. After the war, he resumed his apprenticeship at the Bureau in 1946. Additionally he attended The George Washington University in Washington, DC, and eventually received a law degree. Berry worked his way up in the organization, becoming a plate printing foreman, Superintendent of the Examining Division, Chief of the Office of Securities Processing, and Assistant Director for Administration before being named Bureau Director in 1977. He retired from Government service in 1979 after serving over 33 years in the Bureau of Engraving and Printing.

## **HARRY R. CLEMENTS** (1929– )

**Director, Bureau of Engraving and Printing**  
1979–1982

Harry Clements was born in Blackwell, Oklahoma, and was raised in both Oklahoma and Kansas. After graduation from high school, he served in the Army for a short time and then earned bachelor's and master's degrees in aeronautical engineering from Wichita University (now Wichita State University) in Kansas. Clements worked in the aerospace and transportation industries in a variety of technical and managerial positions for over 20 years. He entered Government service in 1972 through a personnel exchange program, working at the Occupational Safety and Health Administration. The next year, in 1973, Clements was appointed by President Richard Nixon as Deputy Director of the Rehabilitation Services Administration of the Department of Health, Education, and Welfare. He then served as head of the National Industries for the Severely Handicapped for 3 years before joining the Bureau of Engraving and Printing as the Director. After resigning from the Bureau in 1982, Clements returned to the private sector and held various positions in the aerospace and defense industries. He also earned a master's degree in economics from George Mason University in Virginia. Clements returned to Kansas in 1988 where he headed a manufacturing firm and later taught economics at Wichita State University.



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## **ROBERT J. LEUVER** (1927– )

**Director, Bureau of Engraving and Printing**  
1983–1988

Robert Leuver is a native of Chicago, Illinois, and was raised there and in Buffalo, New York. He received a master's degree from Catholic University of America in Washington, DC, and taught high school and college for several years. He went on to hold numerous managerial and administrative positions in educational, business, and private institutions. In 1972, he began his Government service with ACTION (the umbrella agency for the Peace Corps, VISTA, and other volunteer service agencies). He went on to hold management posts at the Treasury Department in the Employee Data and Payroll Division and in the Management Information Systems program. Leuver joined the Bureau of Engraving and Printing in 1979 as Assistant Director for Administration and later held the Deputy Director position before appointment as Director in 1983. After resigning from the Bureau in 1988, Leuver served as the Executive Director of the American Numismatic Association for 10 years, consulted for printing corporations, earned a Ph.D. in business and economics, and formed a private consulting practice.



**PETER H. DALY** (1941– )

**Director, Bureau of Engraving and Printing**  
1988–1995



Peter Daly was born in Perth Amboy, New Jersey. He earned a bachelor's degree in economics from Villanova University in Pennsylvania. Daly began as a management intern in the Treasury Department in 1965 and worked in the Office of Policy Planning as well as in the Savings Bond Division. He moved to the Bureau of Engraving and Printing in 1968 and worked in labor relations, eventually serving as the first chief of the newly formed Human Resource Development Division. Daly later worked as the Assistant to the Director and Chief of the Office of Planning and Policy Analysis before leaving to become the Deputy Director of the U.S. Savings Bond Program. In 1983, he returned to the Bureau as Deputy Director and in 1988 he was appointed Director. During his tenure, Daly oversaw planning and completion of the Bureau's Western Currency Facility in Fort Worth, Texas, the first Government currency production plant outside of Washington, DC. After leaving the Bureau in 1995, Daly worked as a senior advisor in the Office of the Secretary of the Treasury, during which time he served on the President's Commission on Critical Infrastructure Protection. Since retiring from Government service in 1998, Daly has performed contract and private consulting for several corporations and nonprofit agencies.

**LARRY E. ROLUFS** (1942– )

**Director, Bureau of Engraving and Printing**  
1995–1997



Larry Rolufs was born in Springfield, Missouri, and grew up in northern California. He received a bachelor's degree from California Polytechnic State University in printing engineering and management and later went on to earn a master's degree in printing management from South Dakota State University. Rolufs began his Government career in 1967, working first at the Internal Revenue Service. He also held printing management positions with the U.S. Geological Survey and the National Ocean Survey until 1979, when he joined the Bureau of Engraving and Printing as the Assistant Director of Operations. Rolufs left the Bureau in 1982 to become Deputy Director of the U.S. Mint and later served as a Deputy Treasurer at the Treasury Department. In 1986, he joined the U.S. General Accounting Office as Chief of Printing and went on to become an Assistant Director in that agency's Office of Information Management and Communications. Rolufs was appointed Director of the Bureau of Engraving and Printing in 1995 and served for 2 years, retiring in 1997 after 30 years of Government service.



## **THOMAS A. FERGUSON** (1950– )

**Director, Bureau of Engraving and Printing**  
1998–

Thomas Ferguson was born and raised in Trenton, New Jersey. He attended Lafayette College in Pennsylvania and later, while in Government service, received a Master of Public Administration degree from the University of Southern California. He joined the Bureau in 1974 as a quality assurance specialist and later served in various production positions including Manager of the Production Management Staff and Chief of Currency Production and Stamp Printing. In 1988, Ferguson headed the Office of Advanced Counterfeit Deterrence. He went on to hold management positions as Deputy Assistant Director of Operations and Assistant Director of Research and Technology, during which time he chaired the New Currency Design Task Force that developed recommendations for the new counterfeit deterrent security features incorporated in the Series 1996 currency. He then served as Assistant Director of Management and Deputy Director before his appointment as the 24th Director of the Bureau of Engraving and Printing in 1998.



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