

ANNUAL REPORT
OF THE
PUBLIC PRINTER

1927



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
D. C.

GOVERNMENT PRINTING OFFICE

Public Printer.—GEORGE H. CARTER, Iowa

Deputy Public Printer.—JOHN GREENE, Massachusetts.
Production Manager.—ELLWOOD S. MOORHEAD, Pennsylvania.
Assistant to Public Printer.—MISS MARY A. TATE, Tennessee.
Chief Clerk.—HENRY H. WRIGHT, New York.
Assistant Chief Clerk.—J. THOMAS FORD, New York.
Superintendent of Accounts and Budget Officer.—JAMES K. WALLACE, Ohio.
Assistant Superintendent of Accounts.—FRANK E. BUCKLAND, Indiana.
Purchasing Agent.—ERNEST E. EMERSON, Maryland.
Assistant Purchasing Agent.—WILLIAM J. CASSIDAY, District of Columbia.
Superintendent of Documents.—ALTON P. TISDEL, Ohio.
Assistant Superintendent of Documents.—MISS JOSEPHINE G. ADAMS, District of Columbia.
Superintendent of Planning.—WILLIAM A. MITCHELL, North Carolina.
Assistant Superintendent of Planning.—ROBERT W. SUMMERS, New York.
Storekeeper and Traffic Manager.—WILLIAM H. KERVIN, New York.
Assistant Storekeeper.—GEORGE LAMB, Pennsylvania.
Medical and Sanitary Officer.—DR. DANIEL P. BUSH, Nebraska.
Assistant Medical and Sanitary Officer.—DR. ARTHUR G. HUNT, Oklahoma.
Technical Director.—EDWARD O. REED, District of Columbia.
Disbursing Clerk.—EDWARD J. WILVER, Pennsylvania.
Instructor of Apprentices.—BURR G. WILLIAMS, Iowa.
Congressional Record Clerk.—WILLIAM A. SMITH, District of Columbia.
Superintendent of Printing.—HERMANN B. BARNHART, Indiana.
 HENRY W. WEBER,¹ Indiana.
Assistant Superintendent of Printing.—MAURICE H. PHILLIPS, Ohio.
Foreman Linotype Section.—WILLIAM D. SKEEN, Pennsylvania.
Foreman Monotype Section.—WILLIAM H. CHASE, Maryland.
Foreman Proof Section.—MARION E. BULLOCK, Maryland.
Foreman Patents Section.—RAYMOND H. LECRAW, Rhode Island.
 CHARLES GARRELS,² Illinois.
Foreman Hand Section.—HUGH REID, Wisconsin.
Foreman Job Section.—ALLAN C. CLOUGH, New Hampshire.
Foreman Library Printing Branch.—JAMES H. HESLET, Kansas.
Chief Type Machinist.—DANIEL L. LIDDLE, Michigan.
Superintendent of Press Work.—BERT E. BAIR, Michigan.
Assistant Superintendent of Press Work.—DANIEL BECKWITH, New Hampshire.
Foreman Main Pressroom.—DANIEL I. LEANE, New York.
Foreman Job Pressroom.—JAMES E. VEATCH, New York.
Foreman Postal Card Section.—JOSEPH A. FENTON, Michigan.
Foreman Money Order Section.—JOHN A. MASSEY, Jr., Georgia.
Superintendent of Binding.—MARTIN R. SPEELMAN, Missouri.
Assistant Superintendent of Binding.—JOHN A. PATTERSON, New York.
Foreman Pamphlet Binding Section.—CHARLES J. OREM, Maryland.
Foreman Ruling and Sewing Section.—WALTER H. OLIVER, Maine.
Foreman Library Binding Branch.—GEORGE R. ERLER, Maryland.
 CHARLES F. WESTON,¹ Massachusetts.
Superintendent of Platemaking.—EDWARD G. WHALL, Massachusetts.
Assistant Superintendent of Platemaking.—EDWARD A. KERR, Massachusetts.
Foreman Molding Section.—JAMES H. BABCOCK, Jr., Rhode Island.
Foreman Photo-Engraving Section.—WILLIAM H. MEYER, Maryland.
Night Assistant Production Manager.—EDWARD A. HUSE, Massachusetts.
Assistant Superintendent Presswork, night.—JOHN D. MEYERS, Ohio.
Foreman Linotype Section, night.—HARRY L. MURRAY, Pennsylvania.
Foreman Monotype Section, night.—WILLIAM A. MORRIS, Missouri.
Foreman Proof Section, night.—HARRY B. GOODRELL, Iowa.
Foreman Hand Section, night.—GEORGE O. ATKINSON, Massachusetts.
Assistant Foreman Pamphlet Binding, night.—CHARLES C. COVERT, New York.
In Charge Platemaking, night.—HERMAN C. GROTH, Pennsylvania.
Superintendent of Construction and Maintenance.—ALFRED E. HANSON, Massachusetts.
Chief Draftsman.—HENRY A. LUDWIG, Maryland.
Chief Carpenter.—ABRAAM B. BATTON, Maryland.
Chief Machinist.—MICHAEL J. MCINERNEY, New York.
Chief Electrician.—EDWARD H. BRIAN, District of Columbia.
Chief Engineer.—WALTER A. BROWNE, New Hampshire.
Chief Pipefitter.—OVLUP H. GEORGE, New York.
Construction Foreman.—DANIEL W. BRUCE, District of Columbia.
Foreman Sanitary Section.—JOSEPH L. MAY, Virginia.
Chief of Delivery.—WALTER G. COPP, District of Columbia.
Captain of Guards.—CHARLES H. WARNER, District of Columbia.

¹ Died.

² Retired.

ANNUAL REPORT OF THE PUBLIC PRINTER

UNITED STATES GOVERNMENT PRINTING OFFICE,
OFFICE OF THE PUBLIC PRINTER,
Washington, D. C., April 16, 1928.

To the Congress of the United States:

In lieu of the customary report to Congress and in the interest of economy in printing, I submit herewith the statement of the Public Printer as printed in the hearings of the legislative subcommittee of the House Committee on Appropriations, covering the work of the Government Printing Office for the fiscal year 1927 and reviewing the improvements under its present administration for the seven years beginning April 5, 1921.

The thoroughness with which the subcommittee of the House Committee on Appropriations investigated the operations of the Government Printing Office is worthy of even more widespread attention than is given to the limited print of its hearings, and therefore it seems fitting and proper to republish in this public report the statements made at the hearings held recently by the subcommittee. It is also gratifying that the principal recommendations submitted at the hearings have been included in the Government Printing Office appropriations for the fiscal year 1929 as passed by the House without opposition. With this helpful consideration by Congress, the Government Printing Office will begin another year of its efficient operation under highly favorable conditions, made possible by the generous co-operation of the Appropriations Committees and the Joint Committee on Printing of Congress and of the Public Buildings Commission.

To the Public Buildings Commission is due special thanks for the allotment of \$1,250,000 for a much-needed building addition, which will be started in a short time and will greatly facilitate the work of the Government Printing Office. Proceedings to acquire additional land have been completed, and building plans have been carefully prepared with the able and courteous assistance of the Supervising Architect of the Treasury Department. It is hoped to have the additional floor space of 150,000 square feet available in about a year, and that then the Government Printing Office, with a total floor space of more than 900,000 square feet, will be not only the largest but also the best housed printing establishment in the world. There will then remain only the replacement of the old building with a modern fireproof warehouse to complete the wonderful work of rehabilitation that has been in progress for the last seven years, and it is earnestly hoped that Congress will express in this project also its cordial support of the Government Printing Office.

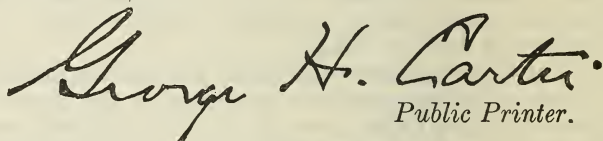
For the further information of Congress concerning the fiscal affairs of the Government Printing Office, several statistical tables

covering the year ended June 30, 1927, are submitted herewith as an appendix to the hearings on the appropriations for the fiscal year beginning July 1, 1928. Included also are the annual reports of the Technical Director and the Superintendent of Documents, inasmuch as their important work under the direction of the Public Printer was not covered fully by the statements to the Appropriations Committee.

Under authority of the act approved February 23, 1927 (Public, No. 631), the Public Printer has discontinued the printing of such other and additional reports for the fiscal year ended June 30, 1927, as have usually been submitted to Congress concerning the business of the Government Printing Office. The original copies of such reports are on file in the office of the Public Printer for public inspection as provided for in said act.

The cost of printing the Public Printer's reports for the seven years 1914-1920 was \$36,349.68, and for the seven years 1921-1927 the cost was \$4,980, which shows a saving of \$31,369.68 in the printing of the Public Printer's reports for the last seven years.

Respectfully submitted.


Public Printer.

HEARINGS BEFORE SUBCOMMITTEE
OF HOUSE COMMITTEE ON APPROPRIATIONS

CONSISTING OF

MESSRS. FRANK MURPHY (CHAIRMAN),
GEORGE A. WELSH, WILLIAM P. HOLADAY,
JOHN N. SANDLIN, AND EDWARD T. TAYLOR

IN CHARGE OF

LEGISLATIVE ESTABLISHMENT APPROPRIATION BILL
FOR 1929

[Reprint of Hearings, pages 306 to 347, inclusive]

HEARINGS ON APPROPRIATIONS

MONDAY, MARCH 26, 1928.

GOVERNMENT PRINTING OFFICE

STATEMENTS OF GEORGE H. CARTER, PUBLIC PRINTER; J. K. WALLACE, SUPERINTENDENT OF ACCOUNTS; A. E. HANSON, SUPERINTENDENT OF CONSTRUCTION AND MAINTENANCE; AND A. P. TISDEL, SUPERINTENDENT OF DOCUMENTS

Mr. MURPHY. Mr. Carter, you are the Public Printer, having in charge the Government Printing Office?

Mr. CARTER. Yes, sir.

Mr. MURPHY. Will you at this time make a general statement for the information of the committee and for the record, showing the organization of the Government Printing Office, what it does, and how it does it?

Mr. CARTER. Before I begin, I would like to take this opportunity to thank the members of the committee for their recent tour of inspection of the office. To my knowledge of the Government Printing Office, covering 20 years, it was the first time that the Subcommittee on Legislative Appropriations ever visited the Government Printing Office, and I want to assure you on behalf of the employees and myself that we deeply appreciate the fine interest you showed in our work. In view of your inspection of the office, I take it, Mr. Chairman, that it is not necessary for me to go into detail about the equipment and condition of the Government Printing Office at the present time.

The Government Printing Office, as you know, is by far the largest book and job printing plant in the world. It also compares very favorably with the largest newspaper and magazine plants, in that we publish some forty-odd daily, weekly, and monthly periodicals, including the Congressional Record. There is no plant in the world equipped to handle the Record with the speed and accuracy with which the Government Printing Office does that work.

The Government Printing Office is also one of the largest establishments of the Government in Washington. It is larger than 6 of the 10 executive departments in number of employees in Washington. The only executive departments having more employees in Washington are the Treasury Department, the Navy Department, the Agricultural Department, and the Department of Commerce. The Government Printing Office is also larger than 20 of the 22 independent establishments in Washington, the only one having more employees being the Veterans' Bureau.

The work of the office, of course, is confined to printing for the Government exclusively. We do no private printing at all, except speeches for Members of Congress, which is authorized by law and confined to extracts from the Congressional Record.

It may interest the committee to know that our resources last year; that is, the receipts of the office, amounted to \$13,588,966.51, and that our disbursements, including outstanding obligations, were \$12,625,315.33, leaving an unexpended and unobligated balance of \$963,651.18, which is subject to some reduction for outstanding orders. In other words, we turned back into the Treasury, unused, \$963,651.18.

MACHINERY AND EQUIPMENT OF PLANT

Mr. MURPHY. Mr. Carter, before going into that phase of the question of the management and operation of the Printing Office, would you be prepared to put in the record, if you do not have it with you, figures showing the number of printing devices of various kinds that are used at the Government Printing Office, giving us the physical structure of the printing department, showing the number of various kinds of presses, etc.? I want this record to show what sort of a department the Government really has there.

The hearings we are having before this committee, I think, will be used and sent out by Members of Congress to schools, probably, for the information of those who are studying in a serious way the development and inner workings, if you please, of our Government here in Washington, and for the benefit of the record we would like to have you prepare, if you do not have it with you, a statement showing what you do down there in the way of finished work and the improved machinery you have with which to do that work.

Mr. CARTER. We have a complete printed inventory of all the machinery and equipment of the office, which I will be glad to submit to the committee.

Permit me to say, generally, that we have the largest battery of typesetting machines in the world, more than 380 machines, including 148 linotype machines, 100 monotype keyboards and 129 monotype casting machines, 1 intertype, and 2 Ludlow machines.

We have 186 presses, including 26 web presses, and the two Record presses which are the latest and fastest type of magazine printing presses.

The bindery is also equipped with the fastest and the latest models of machines and devices for that work, and the plate-making division is also up to the last word in equipment.

In compliance with your request, I will be pleased to submit a more detailed description of the work of the Government Printing Office and its vast equipment.

(The statement follows:)

The mechanical improvements in the Government Printing Office have of necessity kept pace with the great increase and betterment of its production in the last few years. This has been made possible by the liberality of Congress, which increased the allowance for new machinery from \$100,000 to \$200,000 annually for the last five years, and also to the generous cooperation of the Joint Committee on Printing, which has helpfully supported the Public Printer in all his extensive undertakings for the rehabilitation of this great industrial establishment.

With the changes that have been made in the last five years and the plans that have been adopted for future improvements, the Government Printing Office is assured of leadership, not only as the greatest printing works but also as one of the most efficient and best equipped manufacturing plants in the world.

In addition to its 4,086 employees, the Government Printing Office houses 1,325 machines, which are required to carry on the enormous work of the plant. Many of these machines have been installed or replaced by more productive and modern equipment in the last six years.

In the printing division are 148 linotype, 1 intertype, and 2 Ludlow machines; 100 monotype keyboards and 129 monotype casting machines. The 129 monotype casting machines have been completely reequipped with electrically heated pots and electrical control boards, greatly improving the conditions in that room, where the heat and the fumes of the old gas pots seriously affected working conditions. All of the linotype machines have been equipped with automatic metal feeders, likewise greatly improving their production. One thousand two

hundred and eighty persons are employed in the printing division. Ems of type set during a year total 2,060,000,000, which would make about 580,000 columns of an ordinary daily newspaper.

For presswork are required 186 presses, made up of 26 web, 107 cylinder, 25 platen, 10 sheet-feed rotary, 8 automatic-feed envelope, 3 offset, 5 tabulating card, and 2 embossing presses. Among the more recent equipment are a number of new presses, including the 3 big postal-card presses, two 64-page Congressional Record presses, and 3 large offset presses. Many automatic feeders have been added to the printing presses, with a reduction in five years of 45 in the number of persons employed at press feeding. Automatic humidifiers have been installed to better the atmospheric conditions of the pressrooms and overcome static electricity troubles in the handling of paper. There were 146,000 forms of type and plates sent to press in one year, and the production is 2,000,000,000 chargeable impressions. Six hundred persons are employed on this work.

For folding and binding operations 310 machines are required, including 30 folding, 8 gathering, 22 wire-stitching, 57 sewing, 14 ruling, and 61 cutting and trimming machines. Among recent installations are a new case-making machine which turns out 12,000 cloth book covers daily, as compared with 2,500 covers produced by the old-type machines; a new perfect binding machine which will also greatly speed up production of paper-covered books; several new-style cutting machines which will greatly facilitate this work; one new type of a folder, doing more than double the work which formerly kept two machines busy; and a disk ruling machine, equipped for either roll or sheet stock and having an automatic cardboard inserter, which has materially advanced the delivery of ruled work. Gumming and stripping machines have replaced slower hand operations. Eight hundred and sixty-three persons are employed in the bindery and the output is valued at over \$2,300,000 a year.

About 12,000,000 square inches of various kinds of printing plates are made yearly in the plate-making division, employing 90 persons. Over 100 modern machines are in use on this work, including one 3,000-ton lead molding, 1 stereotype molding and drying, 1 stereotype molding, and 5 wax-molding machines; 1 Hacker test press for plate precision; 1 plate straightening and 2 wax ruling machines; 1 stereotype mat-making machine, 12 routers, 16 saws and trimmers, 31 stereotype casting boxes, and other miscellaneous machines. Much of this equipment is of recent installation and has helped materially in the production of high-grade plates.

Several years ago the Public Printer installed a photo-engraving plant, well equipped with 4 cameras and the necessary machinery and equipment to handle line cuts and 120 to 175 line screen halftones, which formerly were purchased commercially. The photo-engraving plant produced about 700,000 square inches of plates last year.

The principal production items of printing and binding for the fiscal year 1927 were as follows:

Jackets written	number	54, 168
Estimates made	do	47, 452
Bills computed	do	72, 545
Total ems set	do	2, 060, 248, 100
Time work in composing sections	hours	242, 836
Electrotypes and stereotypes	square inches	11, 356, 708
Postal cards printed	number	1, 950, 508, 300
Money-order books shipped	do	1, 002, 354
Forms sent to press	do	145, 831
Actual impressions	do	484, 678, 679
Chargeable impressions	do	1, 960, 834, 989
Sheets folded by machine	do	226, 008, 387
Signatures gathered by machine	do	155, 233, 669
Tips made by machine	do	8, 250, 587
Copies wire stitched	do	45, 115, 690
Copies paper covered	do	8, 574, 395
Books and pamphlets trimmed	do	53, 913, 955
Books rounded and backed	do	1, 160, 085
Books marbled and edged	do	163, 477
Stamping impressions	do	2, 736, 425
Books cased in	do	1, 436, 213
Indexes cut	do	140, 359
Sheets passed through ruling machines	do	22, 589, 915

Signatures sewed.....	number.....	76, 210, 279
Copies punched and drilled.....	do.....	95, 356, 979
Sheets and lines perforated.....	do.....	6, 861, 125
Tablets made.....	do.....	2, 889, 402
Miscellaneous rebindings, etc.....	do.....	102, 519

The finished work for the year included:

Blanks, notices, cards, schedules, etc. (including 1,950,000,000 postal cards).....	3, 500, 000, 000
Blank books.....	2, 700, 000
Publications.....	105, 000, 000
Specifications of patents.....	5, 600, 000
Patent Office Gazettes.....	3, 340, 000
The daily and bound Congressional Record.	
Bills, resolutions, amendments, and hearings of Congress.	

The work of the Government Printing Office embraces practically every phase of the arts of printing and binding, excepting lithographing. The office makes many of its own supplies, such as rollers, inks, type metals, glues, etc.; a complete box factory is maintained for making boxes in which to ship postal cards; a completely equipped laboratory is charged with the technical control of all materials and the testing of all materials and supplies purchased to maintain the contract specifications; a fleet of 24 trucks haul paper and other purchases from railroads to the office and delivers work to departments.

The purchase requirements in one year include 43,000,000 pounds of paper, 12,000,000 yards of wire, 3,000,000 containers for postal cards, 60,000 pounds of glue, 200,000 yards of binding cloth, 22,000,000 square inches of gold leaf and other stamping materials, 28,000,000 yards of sewing thread, 100,000 square feet of leather, 13,000,000 feet of monotype keyboard paper, 148,000 pounds of ink, and 3,500 rollers are made on the premises.

The present buildings are valued at \$4,060,000, and the equipment and machinery at \$4,000,000. During the last four and a half years over \$900,000 has been expended for machinery to displace obsolete equipment, some of which had been in use 25 to 40 years.

A belt conveyor 1,000 feet long, with a capacity of 360 sacks an hour, connects with the mailing tables of the city post office, making it possible to deliver sacks of mail to a train in five minutes.

A cafeteria, seating 1,000 persons at a time and serving 3,000 meals every working day, is maintained and operated by the employees, while Harding Hall, with a seating capacity of 1,200, is devoted to welfare activities of employees. All this space was made available by raising the roof and using the space formerly lost in an unused attic.

The Government Printing Office has participated in various expositions throughout the United States and foreign countries. The last exhibit was at the Sesquicentennial Exposition at Philadelphia in 1926, where were displayed many artistic samples of printing and binding, and samples of various materials and ingredients used in the work; a gold medal of honor was awarded the Government Printing Office for this exhibit. An exhibit was displayed at Florence, Italy, in 1925, and under a current appropriation it is intended to display work at Seville, Spain, this year. There is on display at all times in Harding Hall samples of the best products of the Government Printing Office.

HISTORY OF THE PERSHING LINOTYPE MACHINE

MR. MURPHY. We would like also to have you give a short history of the linotype machine and the printing equipment that was sent over with General Pershing to Europe. You now have that equipment, and we would like to have you tell that story as concisely as you can, leaving out nothing of importance, so the House may know something of that activity, because I am sure they will be interested. This committee did not know anything about that work until we saw that equipment down there. There is a human interest in it that will grip us all.

Mr. CARTER. I included in my annual report a rather concise history of the Pershing equipment, which, with your permission, I will be glad to insert as a part of my statement.

Mr. MURPHY. We will be glad to have that, Mr. Carter.
(The statement is as follows:)

There is in daily use in the Government Printing Office a linotype machine which rendered distinguished service in France throughout the war. It is known as the Pershing machine, and was used at General Pershing's headquarters in France to set type for the most confidential communications of the General Staff of the American Army. The Pershing machine is a model No. 5 linotype of American manufacture, but was originally equipped with a French keyboard and designed to cast slugs lower than American height.

The machine was provided at first with a gasoline heater to melt the type metal, but this equipment was so dangerous on account of frequent explosions, from which the operators had several narrow escapes, that electric heaters were secured from the United States.

When General Pershing decided to establish a printing plant at his headquarters in Chaumont he detailed an officer to procure the necessary equipment in France. Two linotype machines were located in a small French printing office and were transported by canal and truck to General Pershing's headquarters.

When General Pershing moved his headquarters from Chaumont, the linotype machines were placed on motor trucks and became part of a fully equipped printing train operated by the Twenty-ninth Engineers. This train accompanied the Commanding General of the American Army throughout the war in France. The printing train of trucks was frequently close to the battle front, and several times subjected to heavy shell fire by the Germans. Nevertheless, at all times and under all conditions the mobile printing plant continued to issue daily the publications which were so essential to the information service of General Pershing's staff.

After the armistice the war printing plant was dismantled and shipped to Camp Humphreys, Va., from which place the Pershing machine was finally transferred to the Government Printing Office at the request of the Public Printer, and given a place of honor as a tribute to the war work of the printing industry.

Although the war machine has been completely reconditioned and now looks much like the 148 other linotypes with which it keeps pace in setting type for prosaic Government documents, it seems to have a more distinguished individuality than all the other machines. Employees hold it in special veneration, and every visitor does homage to the historic machine whose types had recorded war secrets of vital importance and had so faithfully done their bit to help win the World War.

The history of this machine attracted the attention of the International Association of Printing House Craftsmen, and its board of directors generously donated a suitable bronze tablet as a badge of honor. The tablet was unveiled on July 24, 1926, at which time there were present the officers of the International Association of Printing House Craftsmen, who presented the tablet to the Public Printer.

Between two American flags this handsome bronze tablet stands at the top of the Pershing machine proudly telling its war record in these enduring words:

"In honor of a linotype that served its country on the battle fields in France
* * * there upon a throbbing motor truck, mid shot and shell, this machine typed General Pershing's commands to America's victorious Army."

Beneath the inscription and between the seals of the Government Printing Office and the craftsmen's organization is the following statement:

"This tablet has been placed here by the International Association of Printing House Craftsmen, July, 1926."

On the wall near the machine are several photographs of the printing plant and motor trucks at General Pershing's headquarters in France showing the machine in operation during the war.

The Public Printer has placed the Pershing machine in the special custody of Corp. James M. Kreiter, who was one of the printers who operated it during the war in France and is now one of the 540 war veterans employed in the Government Printing Office.

WORKING-CAPITAL FUND

Mr. MURPHY. You may proceed with your general statement.

Mr. TAYLOR. I think what the chairman wants is to have you tell us where you get this money and what use is made of it.

Mr. CARTER. Our resources, to which I have already referred, come, in the first instance, from a working capital which is appropriated in this bill and amounted last year to \$2,500,000. That is the only direct appropriation that the office has for printing and binding. All of the other funds must come from the appropriations that are made to the various departments and establishments of the Government.

Mr. MURPHY. Does the Government Printing Office make a profit from any of the work done for the other departments of the Government that would go toward supplementing this \$2,500,000 working capital?

Mr. CARTER. We are restricted by law to do work at actual cost, and therefore our scale of charges must be based upon the cost of production determined by past experience, so that at the end of the year there is substantially no profit and no surplus.

Last year, on approximately \$13,000,000 of business, our charges exceeded the expenses of production by about $1\frac{1}{2}$ per cent. The year before the excess was only 2 per cent.

Mr. MURPHY. In figuring on costs, Mr. Carter, do you figure as a private firm would figure, keeping in mind the overhead and depreciation of the plant, etc., or is that absorbed in this \$2,500,000 appropriated each year?

Mr. CARTER. May I explain that the \$2,500,000 is simply an advance of a necessary working capital against which is chargeable all the printing for Congress. Last year the work for Congress cost \$2,232,969 which was charged against the \$2,500,000 working capital. This appropriation is simply an advance to the office of working capital, which is required at the beginning of a fiscal year because then we undertake heavy expenditures for labor and material for which we receive no money from the departments until the work is done.

Mr. MURPHY. You might explain to the committee and for the record how you finance your office. You begin the fiscal year with an appropriation of \$2,500,000. That is an advanced payment by Congress for the activities that Congress will give to your office in the way of the printing of the Congressional Record, and other activities?

Mr. CARTER. That is the situation. Of course, we do not get all of the \$2,500,000 at once; it is simply a credit on books of the Treasury available to us from time to time during the year.

Mr. MURPHY. You do not use it as a lump sum?

Mr. CARTER. No. This new system of financing the office was adopted by your committee several years ago, and it has worked out far more businesslike and has aided us greatly in keeping more accurate records and better control over printing than the former system of allotments.

PRINTING COSTS COMPARISONS

Mr. MURPHY. You may proceed with your general statement.

Mr. CARTER. As I recall, you asked me how our cost-keeping system and charges compare with those in commercial establishments. They are quite comparable, except we do not carry any depreciation charge, and we have no interest, taxes, rental, or insurance to pay. But we charge in all the expenditures of the office, including overhead, the cost of machinery and maintenance and every other expenditure, including all leave of absence with pay that is incurred. Our heavy leave pay of about \$900,000 a year practically offsets the depreciation, interest, rental, tax and insurance charges that we would have to pay if a private concern.

Mr. MURPHY. How do you arrive at the costs when you do work for a department of the Government? Do you furnish them with estimates before the work is ordered by them, or is the work taken and done and then the costs kept as the work proceeds through the office, until its final completion?

Mr. CARTER. The law requires us to submit an estimate in advance to a department, so that they may know whether the cost of the job in view comes within their appropriation. But the Government Printing Office is not bound by its estimate. After a job is completed, we compute the cost, based upon our scale of charges. It is not the actual cost of that particular job, but the average cost of the operations, as determined by the previous year's work. We have a fixed scale of charges which is adjustable from time to time. We readjust the scale of charges at least every year.

Mr. MURPHY. How do costs for this year compare with the costs of last year, and what is the outlook for the coming year with reference to costs of doing work in the Government Printing Office?

Mr. CARTER. The scale of charges this year is about 1 per cent higher than last year. Our costs this year are only about 9½ per cent higher than they were in 1921. In the meantime we have had a tremendous increase in wages, much new machinery has been installed, and there have been many other expenditures for the improvement of the plant. The wage increase alone was around 32 per cent; we also had to absorb the bonus, which was not charged against printing and that amounted to about \$900,000 a year. So I think the increase of approximately 9½ per cent on the whole scale for the seven years was fair and reasonable and not at all excessive.

I do not look for any material increase in charges in the future. As soon as the program for the installation of new machinery and the erection of a large addition to the main building is completed within a year or two there can be a very material decrease in the charges for printing and binding.

Mr. MURPHY. You have absorbed this increase in the cost of labor by increased efficiency on account of the installation of new machinery, have you not?

Mr. CARTER. That has been the principal reason. Of course, there has been an increase of charges in the past of about 9½ per cent, but the principal reason for charges not going higher has been the increased efficiency of the employees and the new machinery that has been installed.

Mr. MURPHY. You do find that well-paid employees are very much more efficient than employees who are discontented with what they are receiving as wages?

Mr. CARTER. The record of our office proves that absolutely.

PAPER COSTS

Mr. MURPHY. What about the price of paper?

Mr. CARTER. The price of paper the coming year is somewhat less than last year. Contracts were recently awarded by the Joint Committee on Printing, and on the basis of the estimated quantity, there is a reduction of about \$175,000 shown for the coming year. We buy approximately \$3,200,000 worth of paper a year.

Mr. MURPHY. You, of course, buy it from all sources of supply?

Mr. CARTER. The Joint Committee on Printing advertises for proposals, and 40 or 50 of the leading manufacturers and dealers in the country compete for that business. At the last opening of bids there was very keen competition.

Mr. MURPHY. There is never any complaint of any favoritism in the giving of contracts for furnishing material for the Printing Office?

Mr. CARTER. Paper and all other materials are furnished on a definite specification. Every contractor is required to furnish paper of the quality prescribed by the Government and no contractor is accorded any favors.

Mr. MURPHY. So the standard is set by the Government Printing Office?

Mr. CARTER. It is; that is, the Public Printer adheres to the standards as fixed upon by the Joint Committee on Printing.

SUPERVISION OF GOVERNMENT PRINTING OFFICE

Mr. MURPHY. Mr. Carter, for the benefit of the committee and the record you might state at this time how the Government Printing Office is governed. We have in Congress a Joint Committee on Printing. You might state what they do in the way of supervision of the Government Printing Office, etc.

Mr. CARTER. Senator Root once said in a debate in the Senate that the Printing Office is an anomaly in our system of administration, it is neither under Congress nor any executive department. The Public Printer is appointed by the President and confirmed by the Senate, but other than that the President does not exercise any active control of its management. The Joint Committee on Printing acts as board of directors for the Government Printing Office, and to that body the Public Printer has to look for advice and counsel, and for the approval of many of his purchases, such as paper and machinery. Otherwise, the Government Printing Office is an absolutely independent establishment and the Public Printer has to assume entire and sole responsibility for its management. However, the Joint Committee on Printing exercises, and has always exercised, in my experience of 20 years, a very close and keen observation over the operation of the office. Our purchases of machinery have to

be submitted to that committee. All open-market purchases of paper are approved by the committee.

Mr. MURPHY. To what extent, Mr. Carter, must you secure the approval of that committee when you go to purchase improved machinery or make contracts for paper, or carry on any other activity for the benefit of your office?

Mr. CARTER. All of the annual contracts for paper are awarded by the Joint Committee on Printing. All of the open-market purchases of paper, even as little as 10 pounds of any special kind of paper, must come before the Joint Committee on Printing for its approval. All purchases of machinery and equipment amounting to over \$1,000 must have the approval of the Joint Committee on Printing.

The Joint Committee on Printing also has control over the publication of the Congressional Record, the Congressional Directory, and many other special publications of Congress.

Further than that, in the case of adjustment of wages under the Kiess Act, the negotiations must be made, in the first instance, by the Public Printer and a committee representing the trade affected, but any new scale can not go into effect unless it receives the approval of the Joint Committee on Printing.

So, on the whole, I think the Joint Committee on Printing acts efficiently as a board of directors for the Government Printing Office in carrying out its varied duties under the law. All of the committees that I have had contact with in 20 years have had a very keen and helpful interest in the office.

Mr. TAYLOR. Are any of the present members of the Joint Committee on Printing printers themselves?

Mr. CARTER. There have been some who were printers. Senator Smoot was chairman of the committee for a number of years. He is a keen business man of wide experience and was a great help to the office at all times. I personally feel deeply indebted to Senator Smoot for his able counsel and advice to me as clerk of the Joint Committee on Printing and as Public Printer. Senator Fletcher was chairman of the committee for some years, and I certainly felt that he took a very fine interest in the office. He has done many splendid things for the advancement of the Government Printing Office. Senator Moses, the present chairman, is interested in one of the largest and most successful printing concerns in New England, the Rumford Press, at Concord, N. H. Senator Moses has devoted unlimited time and thought to the affairs of the Government Printing Office, and to him, with the able assistance of all the other members of the Joint Committee on Printing, is due much credit for its present success.

The number of employees of the office is about the same as last year. There are 4,086 on the rolls at present. There has been an average decrease of 281 employees in the last seven years as compared with the seven years preceding. The decrease from the peak employment in October, 1919, is 1,221. In that month the office had 5,307 employees. Of course, that was the overload from the war period.

AVERAGE NUMBER OF EMPLOYEES DURING LAST FIVE YEARS

Mr. MURPHY. At this point, will you put in the record a statement showing the average number of employees in your office, covering a period of five years.

Mr. CARTER. The average number of employees on our rolls for the last five years was 4,002 in 1923, 4,007 in 1924, 4,101 in 1925, 3,985 in 1926, and 4,103 in 1927.

INCREASE IN WORK PERFORMED BY EMPLOYEES

We have done the work with fewer employees, due, as I have said, to improved machinery and increased efficiency. The increased efficiency of the employees is indicated particularly in the case of the linotype operators, who, in 1920, set an average of 3,545 ems per hour, while the average of 1927 was 4,883 ems per hour. An em is the standard measurement of typesetting. Monotype operators in 1920 had an average of 4,528 ems per hour, while last year it was 7,312 ems per hour.

WORK PERFORMED FOR CONGRESS

During the last year we have done more work for Congress, particularly in the last session, than for any short session of Congress in history.

The cost of the Congressional Record last year was \$551,000, and the cost for the Sixty-ninth Congress was \$715,000.

The cost of printed hearings, which is a growing expenditure by Congress, was approximately \$285,000.

Mr. TAYLOR. Do you make any money except what you charge for printing Congressmen's speeches?

Mr. CARTER. We do that practically at cost.

Mr. TAYLOR. So it really does not cost the taxpayers anything?

Mr. CARTER. Not a cent. We see to it that the Government does not lose anything. The printing of speeches last year cost about \$66,000, all of which was charged to and paid by Members of Congress out of their own funds.

Mr. TAYLOR. It was all paid by the Congressmen themselves?

Mr. CARTER. It was all paid by the Congressmen themselves.

In our expenditures in seven years, amounting to approximately \$80,000,000, we have had no bad debts in the whole amount. We have had only about \$500 in disallowances by the Comptroller General and every cent of that has been reimbursed to the Treasury. None of the disallowances were due to any mismanagement or irregularities but were simply on account of errors in pay rolls, and a disallowance to a contractor for liquidated damages. Every dollar of the disallowances has been fully accounted for to the Comptroller General and there are no uncollectible debts.

I wish to call your attention also to some of the outstanding work in the office, in addition to the printing of the Congressional Record and the bills.

For instance, the last Congress passed 896 laws in the first session and 502 in the second session, making a total of 1,398 laws passed by the Sixty-ninth Congress, or more than any Congress since the

Fifty-ninth Congress. Of course, that involved a great increase in printing. It also shows the great increase in the work of Congress.

The present Congress has had printed nearly 17,000 bills for the present session, which far exceeds any prior Congress.

While there has been increased efficiency in the office, there has been some decrease in the total production due to the decrease of employees. That decrease is highly creditable, I think, to the administration of affairs by the Congress and the entire Government.

In the last seven years there has been a decrease of approximately 836,000 pages of type in Government publications; that is to say, there has been less printing of reports, and other publicity matter as compared with the preceding seven years.

PRINTING OF BLANKS, NOTICES, CARDS, AND POSTAL CARDS

On the other hand, there has been a material increase in the printing of blanks, notices, and cards, an increase of over 5,000,000,000 copies, which I think is a good indication of the greater business activities of the Government. In that 5,000,000,000 increase of blanks, notices, and cards there was an increase of over 3,000,000,000 in postal cards alone, which reflects an increasing activity in the business of the country, because postal cards are used largely by mail order and other business concerns.

Mr. MURPHY. All the postal cards used by the Government are printed in your office?

Mr. CARTER. Yes, sir. I might tell you something further of interest in regard to the printing of postal cards. Several years ago the Joint Committee on Printing authorized us to purchase three postal-card presses, at a cost of about \$123,000. In the charges to the Post Office Department for the cards we included the cost of these presses and equipment, and they paid for them in about three years, so that this year we notified the Post Office Department of a reduction of \$200,000 a year in the charge for cards. The Director of the Budget was so advised, and I believe made a corresponding reduction in the postal estimate for that purpose. So we have paid for those presses in approximately three years, and they have greatly increased the production. Last year we printed nearly 2,000,000,000 postal cards, 353,000,000 more than for the previous year.

Mr. SANDLIN. How is the amount of printing affected by the increased rates on the postal cards?

Mr. MURPHY. Did the increase in postage decrease the number of cards required by the Government?

Mr. CARTER. It greatly increased the demand for Government cards, because the Government furnishes a card with a 1-cent stamp on it and the private individual had to put a 2-cent stamp on a private card. That increased greatly the Government business.

Mr. MURPHY. In other words, the business men of the country have been buying their cards direct from the Government, already stamped?

Mr. CARTER. Yes.

We also made a decrease of \$9,000 a year in the charge for printing money orders, so our total reduction for the Post Office Department for the current year will amount to \$209,000.

The Post Office Department is our largest customer. Our business with the Post Office Department amounts to about \$2,500,000 a year, and with Congress, \$2,250,000.

PRINTING FOR PATENT OFFICE, AGRICULTURE, AND POST OFFICE DEPARTMENTS, ETC.

Our next largest customer, after Congress, is the Patent Office, whose payments run over \$1,000,000 a year for the printing of patent specifications and the Patent Office Gazette. We have 42 typesetting machines at work eight hours a day setting up the copy for the patent specifications and the Gazette, but we print only 104 copies of each specification.

There is another large publication that Congress is greatly interested in, and that is the Agricultural Yearbook. We print approximately 400,000 copies a year. The book cost last year \$363,610.48, and made 1,538 pages.

Then there is the printing of the farmers' bulletins, with which you are all familiar. We print around 16,000,000 copies a year, and four-fifths of those are allotted to Members of Congress and one-fifth to the department.

Mr. TAYLOR. Is the number of those publications increasing or is it about stationary, as the number of Members of Congress remains the same?

Mr. CARTER. Congress appropriates a fixed amount each year for the printing of the farmers' bulletins, which regulates the number printed.

Mr. SANDLIN. I have been asked by some Members how that was handled in the Government Printing Office. They have thought that there was too long a delay in sending them out. They thought there was a delay somewhere, and that possibly it might be corrected by putting more employees at work. How are those bulletins handled?

Mr. CARTER. The orders for farmers' bulletins are first sent to the Department of Agriculture, and then transmitted to our office.

I think when Mr. Tisdell comes to his items, he will be very glad to explain to you just what delay there is, if any, and the reason for it. I think I am justified in saying now that the delay has been largely in the department in sending orders to us.

Mr. TISDELL. The delay that has been incurred has been about six or seven days in the department, and an average of two or three days in our office in handling the orders.

Mr. CARTER. It may interest the committee further to know what the increase in wages in the Government Printing Office has been in the last seven years, due to the operation of the Kiess Act.

Mr. MURPHY. Before you go into the wage question, you have another large customer of your office that you have not mentioned, and that is the Treasury Department, in connection with the printing of the income-tax blanks, etc. Will you give us a little story of that activity for the record?

Mr. CARTER. The printing for the Treasury Department amounts to about \$927,000 a year. That was what it cost last year. One large item, of course, was for the printing of income-tax blanks. We print around 100,000,000 income-tax blanks, and that job is generally handled in about 30 days.

Mr. MURPHY. Mr. Carter, when you revise your statement you might prepare for the record a statement showing the outstanding activities of your office, and you might enlarge a little on what you have already stated to us, so that we may have more of the details, and you might make it a little clearer, perhaps. You might mention the outstanding customers and the outstanding figures in reference to what they purchase from your office.

Mr. CARTER. The principal customers of the Government Printing Office and the value of work charged to each for the fiscal year 1927 are as follows:

Post Office.....	\$2, 431, 370. 52
Congress.....	2, 232, 969. 00
Patent Office.....	1, 046, 296. 86
Agriculture.....	997, 337. 83
Treasury.....	927, 861. 17
Commerce.....	803, 091. 46
War.....	645, 415. 52
Superintendent of Documents.....	613, 924. 58
Navy.....	585, 019. 21
Library of Congress.....	320, 996. 47
Justice.....	268, 418. 17
Labor.....	239, 483. 09
Interior.....	236, 488. 50
Total.....	11, 348, 672. 38
46 other miscellaneous Government establishments, with amounts varying from \$100 or less to \$220,000 each.....	1, 343, 642. 11
	12, 692, 314. 49

Mr. HOLADAY. Mr. Carter, with reference to the approximately 100,000,000 income-tax blanks printed in your office, what is the demand for that number?

Mr. CARTER. The Treasury Department explains that it requires from three to five blanks for every taxpayer, inasmuch as they send one through the mails, and if the taxpayer misplaces it he then goes to the collector for additional forms, and takes one or two along to file in his own records.

PRINTING OF GUIDE BOOK FOR LEGIONNAIRES WHO VISITED FRANCE

It is known to you gentlemen, perhaps, that we did a job last summer for the American Legion, the printing of a guide to the American battle fields in France, in which General Pershing was personally and deeply interested. We got it out in less than the promised schedule time, and it was considered a record-breaking undertaking for our office. The books were available to every legionnaire who went to France, and were invaluable to them in visiting the battle fields.

LETTERS OF COMMENDATION ON WORK OF PRINTING OFFICE

General Pershing wrote me a very fine letter in appreciation of our work, and I will be glad to give that letter to you.

Mr. MURPHY. I think that letter ought to go in the record.

(The letter above referred to is as follows:)

GENERAL OF THE ARMIES,
Washington, August 20, 1927.

MY DEAR MR. CARTER: Your letter of August 13 has just been received, accompanied by the first copy of the book, *A Guide to the American Battle Fields in Europe*, which was prepared by the American Battle Monuments Commission and printed by the Government Printing Office.

The degree of excellence attained by you and your organization in every phase of its production is indeed remarkable, and the results accomplished are extremely gratifying to the members of the commission. I feel that you, equally with the commission, have every reason to be proud of this volume.

It is clearly realized that when unavoidable circumstances prevented us from furnishing the manuscript, maps, and illustrations on the date specified, thus seriously reducing the time available to you, such extraordinary efforts were required from you and your assistants that the whole task was necessarily placed on an emergency basis. Under these conditions the facts that you printed a book conforming to the highest technical standards, and, in addition, were able to deliver copies in advance of August 15, the date they had been promised, are convincing proof of the ability and splendid spirit of cooperation which we always have found to characterize your organization.

I have been informed, moreover, of the great personal interest which all in your office have taken in the book and of the cheerful willingness with which they have assisted in every possible way the persons connected with the commission who have been associated with them in this work. This has been appreciated no less by myself than by those to whom the courtesies were directly shown.

I want to extend to you and to each individual of the Government Printing Office who has had a part in the production and distribution of this publication the sincere thanks of myself and the other members of the commission for the manner in which the whole task has been performed.

Please allow me also to express my own appreciation for your courtesy in sending me the first copy of the book.

With kindest personal regards, I am, sincerely yours,

JOHN J. PERSHING,
Chairman American Battle Monuments Commission.

The PUBLIC PRINTER,
Government Printing Office,
Washington, D. C.

Mr. SANDLIN. Approximately how many of those have been sold?

Mr. CARTER. We printed about 20,000 of the guidebooks and most of them have been taken. We sold them at 75 cents a copy, which was the bare cost price. We made that price without putting on the additional percentage which we are allowed to add.

Mr. TAYLOR. Are there any of those left?

Mr. TISDEL. We have a number that have been returned from Paris that are on sale now, and that is all that remain out of the 20,000 that were printed. There was a consignment made to each boat sailing to France on which the legionnaires traveled, so they would be accessible to the members of the legion on the way over.

Mr. CARTER. I also received a letter from the Secretary of Commerce, Mr. Hoover, who was chairman of the International Radiotelegraph Conference, in which he paid the office the highest possible tribute for the printing done for that conference. He says that without our cooperation they would have been unable to have completed the work in the time that they did.

Mr. MURPHY. If there is no objection, we will print that letter in the record.

(The letter referred to is as follows:)

INTERNATIONAL RADIOTELEGRAPH CONFERENCE,
Washington, D. C., December 27, 1927.

PUBLIC PRINTER,
Government Printing Office, Washington, D. C.

DEAR SIR: I have heard nothing but praise from the secretary of the American delegation and the executive officer to the recent International Radiotelegraph Conference for the manner in which the Government Printing Office turned out the printed reports arising out of the labor of the conference. I know very well that the work of such conferences is largely of an emergency and rush nature, which makes the fact that your organization met the demands made upon it all the more praiseworthy. Messrs. Mitchell, Huse, and Barnhart cooperated fully with the various conference representatives and rendered effective service at all times, often under the most trying conditions.

Faithfully yours,

HERBERT HOOVER,
Chairman International Radiotelegraph Conference.

Mr. CARTER. General Lord has also seen fit to pay us a very high compliment for the printing of the Budget. He says:

I also wish to congratulate you on the efficiency of your plant as evidenced by the manner in which the printing of the Budget was handled and the close cooperation between our respective offices in the matter of examination of proofs.

Mr. Ogden L. Mills, Undersecretary of the Treasury, recently sent me a letter expressing the great appreciation of the Secretary of the Treasury for getting out work in connection with his annual report and also in connection with publications relating to the issuance of bonds. We have numerous other letters of appreciation.

Mr. MURPHY. How many of them have you there?

Mr. CARTER. I have only three here, although I have probably 50 of them at the office.

Mr. MURPHY. I think General Lord's letter ought also to go in the record.

(The letter referred to is as follows:)

BUREAU OF THE BUDGET,
Washington, December 5, 1927.

DEAR MR. CARTER: I want to express to you my cordial appreciation of the cooperation extended by you in connection with the preparation and printing of the Budget for 1929, having in mind also the very efficient assistance rendered by Mr. Barnhart, Captain Moorhead, Mr. Huse, and Mr. Wright, the very efficient proofreader whom you detailed temporarily to this office to help us out.

I also wish to congratulate you on the efficiency of your plant as evidenced by the manner in which the printing of the Budget was handled and the close cooperation between our respective offices in the matter of examination of proofs.

I send you my affectionate regards and best wishes.

Sincerely yours,

H. M. LORD, Director.

Hon. GEORGE H. CARTER,
Public Printer.

Mr. CARTER. I really brought those letters, Mr. Chairman, simply as an offset in case there should be some criticism of the office.

I recognize we do not do everything perfectly, and there are some serious delays in handling the work, but on the whole I think the office is better organized than it ever has been and has the most highly efficient force of employees.

Mr. TAYLOR. I want you to realize that what little criticism there may be has about the same effect as water on a duck's back, as far as this committee is concerned.

Mr. MURPHY. You might say for the benefit of the committee and the record at this point that whenever there is any criticism or complaint to be made of the Government Printing Office the matter can be taken up immediately with the Joint Committee on Printing and be thrashed out there very quickly.

Mr. CARTER. Yes, sir; that is another duty that the Joint Committee on Printing has, to which I did not refer—that is, the power to remedy any neglect, delay, duplication, or waste in the public printing and binding, and I think that is a very wise provision. The committee does act under that authority frequently, particularly in effecting economies in printing.

WAGE SCALES

I started to call your attention to the wage increase which was possible under the Kiess Act passed in 1924. That act authorizes the Public Printer to negotiate wage scales with committees of employees not oftener than once a year. Whatever agreement or disagreement the Public Printer and that committee of employees may arrive at is referred to the Joint Committee on Printing for its approval or disapproval.

I might say that the scales were fixed for two years and there has been only one slight change during the current year; that was in carrying on a previous agreement for a certain group of pressmen, giving them an increase of 5 cents an hour, amounting in all to about \$20,000 a year.

During the last year the wage situation has been normal, and I think the employees appreciate the fact that they are now receiving a just and fair rate of pay from the Government, and in return they are doing a just and fair amount of work for the Government.

Mr. MURPHY. How do wages paid at the Government Printing Office compare with wages paid for like service by commercial firms?

Mr. CARTER. They now compare quite favorably. Of course, in adjusting wages in the Government Printing Office, we always take into consideration the special benefits, including 30 days' leave, leave on holidays, and the Saturday half holidays in the summer time with full pay. In adjusting wages we also take into consideration the prevailing rates of pay in private establishments.

The increases in compensation of all employees for the past seven years have amounted to \$12,890,000.

Total compensation paid to employees

Seven years, 1921-1927.....	\$52, 612, 055. 98
Seven years, 1914-1920.....	39, 721, 191. 38
Increase for last seven years.....	12, 890, 864. 60

This increase of 32 per cent in compensation was paid to an average of 281 fewer employees per annum during the seven years 1921-1927 than for the preceding seven years.

The average annual compensation for each employee, including skilled, unskilled, and clerical, for the seven years 1914-1920 was \$1,282.98; and for the seven years 1921-1927 the average annual pay was \$1,814.65, a yearly increase of \$531.67, or 41 per cent.

COMPARISON OF HOURLY COMPENSATION FOR PRINCIPAL TRADES AND GROUPS,
GOVERNMENT PRINTING OFFICE

The following table shows the principal rates of wages for the years 1914, 1921, and 1927, the beginning and ending of the seven-year periods noted above:

Designation	1914	1921, including 10-cent bonus granted by Congress	1927
Compositor.....	\$0.50	\$0.85	\$1.00-\$1.05
Linotype and monotype operator.....	.60	.85	1.05-1.10-1.15
Proof reader.....	.60	.85	1.10
Imposer.....	.60	.85	1.10
Maker-up.....	.60	.85	1.10
Copy editor.....	.65	.85	1.10
Type machinist.....	.60	.90	1.10
Monotype casterman.....	.35	.65	.70
Type machine helper.....	.35-.40	.65	.60-.85
Stereotyper.....	.60	.90	1.10
Electrotype finisher and molder.....	.60	.90	1.10
Photo-engraver.....	None.	None.	1.20
Pressman, cylinder.....	.55	.85	1.10
Pressman, platen.....	.55	.85	1.00
Pressfeeder, cylinder.....	.27½	.55	.70
Pressfeeder, platen.....	.27½	.55	.65
Bander.....	.30	.55	.70
Bookbinder.....	.50	.85	1.00
Bookbinder machine operator.....	.55	.85	1.05
Bindery operative:			
Folder.....			
Folding machine operator.....			
Signature pressman.....			
Perforator.....	.25-.40	.45-.70	.55-1.00
Sewing machine operator.....			
Ruling machine feeder.....			
Supervisor.....			
Stockkeeper.....	.40-.50	.55-.80	.70-1.00
Carpenter.....	.50	.85	1.10
Painter.....	.50	.85	1.10
Electrician.....	.55	.90	1.10
Machinist.....	.55	.90	1.10
Pipefitter (steamfitter and plumber).....	.50	.85	1.10
Skilled laborer.....	.25	.45	.55

I think the employees of the Government Printing Office, outside of those who are under the classification act and the Public Printer and the Deputy Public Printer, who are neither under the classification act nor the Kiess Act, are the best-paid employees in the Government service to-day.

MR. MURPHY. Do the men working on the linotype machines receive a wage equal to the union scale of wages paid in commercial printing establishments?

MR. CARTER. It is equal to or slightly better than that paid in book and job offices, but not equal to that paid by newspapers in large cities, such as New York, where, for special reasons, because they get out those immense papers on a rush schedule, there is a higher rate of pay.

MR. MURPHY. Then in addition to this rate of pay the employees in the Government Printing Office, as you stated, have 30 days' leave each year?

MR. CARTER. Yes, sir.

MR. MURPHY. With full pay?

MR. CARTER. With full pay; yes, sir.

MR. MURPHY. In addition to that, do they have any leave of absence on account of sickness?

Mr. CARTER. We have no sick leave in the Government Printing Office. In that respect, the Government Printing Office practically stands alone among all the other Government establishments.

COMPARISON WITH CONDITION OF EMPLOYEES IN COMMERCIAL PRINTING OFFICES

Mr. MURPHY. How do the hours of labor in the Government Printing Office compare with the hours of labor in commercial printing offices on the outside?

Mr. CARTER. The Government Printing Office works on an 8-hour day basis, but taking into consideration the 30 days' leave, 7 or 8 holidays during the year, and the Saturday half holidays during the summer, the work week for the entire year is approximately 41½ hours. The best on the outside is from 42 to 44 hours, and in most cases it is 48 hours. The labor unions have made a strong drive elsewhere for a 44-hour week. We do better than that now, considering the time employees are off on leave and holidays with full pay.

Mr. TAYLOR. Is not the permanency of the employment in the Government Printing Office, generally speaking, more certain for this class of skilled mechanics than it is in private life?

Mr. CARTER. I think there is considerable to that, Mr. Taylor. There is a permanency in the Government Printing Office, but still, in a well-established business, there is a permanency of employment, too. I know many of the big industrial printing plants have provision for retirement of their employees after long service.

Mr. TAYLOR. Do the big industrial plants have a pension system similar to that of the Government?

Mr. CARTER. Many of them have a pension system, either of their own or in cooperation with the employees.

NIGHT WORK PERFORMED BY EMPLOYEES

Mr. MURPHY. Do the employees in the Government Printing Office receive additional compensation for overtime, for Sunday work, and for night work?

Mr. CARTER. There are several extra rates. The extra rate for night work is 15 per cent above the day rate. The extra rate for overtime is 50 per cent above the day rate, and for Sunday work it is 50 per cent above the day rate.

Mr. MURPHY. Do the people employed in the Government Printing Office change, or have swing turns? In your 8-hour shifts do you swing those men and make the people change, say every two or three weeks?

Mr. CARTER. No; we have no swings, except in our power plant, where there is a fixed and uniform rate for all shifts. When Congress convenes we organize a permanent night force by transferring to the night force some 300 employees, to handle especially the work for Congress, particularly the printing of the Congressional Record, reports, hearings, and bills.

Mr. MURPHY. They work continuously at night?

Mr. CARTER. They work continuously at night during the session of Congress. At other times we have a smaller night force.

Mr. MURPHY. If they do work at night, then you try to make provision for them in daywork if their health will not permit them to continue working at night?

Mr. CARTER. That is quite true. Up until the time there was a considerable increase in wages, there was strong pressure to put people on night work and to increase the number put on night work, but in the last two or three years, since the increase in wages has been in effect, we have had to draft some people for night work.

Mr. MURPHY. Even with the additional 15 per cent wage?

Mr. CARTER. Yes, sir.

TURNOVER IN PERSONNEL

Mr. MURPHY. Mr. Carter, could you tell the committee what the turnover has been in the Government Printing Office in the last five years? Has it gone up or come down?

Mr. CARTER. The turnover last year was approximately 20 per cent. Prior to that time it was about 30 per cent. With the increased wages, there has been a material reduction in the turnover.

Mr. TAYLOR. How does that turnover come about, on account of deaths, resignations, or marriages?

Mr. CARTER. It comes about by deaths, resignations, and retirements.

Mr. MURPHY. Is there any special department where it is larger than in another department of your work?

Mr. CARTER. The largest turnover, of course, is with the messenger boys who come and go as the school terms come and go; and then there is a considerable turnover among the laborers. But in the skilled trades there is not so much turnover; the employment there is pretty well fixed now.

Mr. MURPHY. What would you look upon as a normal turnover for an activity such as the Government Printing Office?

Mr. CARTER. I think anywhere from 10 to 20 per cent would be a normal turnover, considering the deaths and retirements.

Mr. MURPHY. Naturally in the Government service, by reason of the retirements, there is an increase in the percentage of turnover?

Mr. CARTER. Yes.

Mr. MURPHY. Because necessarily each year there are a number of people retired from the activities of your office.

Mr. CARTER. Last year we retired about 50. Since the retirement law went into effect in 1920 there have been 745 retirements from the office.

Mr. TAYLOR. How does the retirement in the Government Printing Office service compare with retirement provisions in other big printing establishments or newspaper offices?

Mr. CARTER. My impression is that newspapers generally do not have a retirement provision for their employees. Some of the larger offices do have provisions of that kind. The New York Times gives a \$5,000 insurance policy to each employee who has been in the service 30 years.

Mr. TAYLOR. Very few papers do anything of that kind?

Mr. CARTER. There are not many papers that have such provisions for their employees. The Washington Star has a similar provision I understand, but that is not the general rule.

BALANCE RETURNED TO TREASURY

Mr. MURPHY. Mr. Carter, last year you turned back to the Treasury \$963,651, or rather you had a balance of that amount. Can you state just how that balance occurred and what happened to it?

Mr. CARTER. It was all turned back into the Treasury to the credit of the Government. Of that amount \$9,196 was from the office of the Public Printer and \$936,988 was from the receipts for work done. In addition \$7,466 was from salaries appropriated for the office of the Superintendent of Documents, and \$10,000 saving in expenses of the office of the Superintendent of Documents. Part of the balance was due to the fact that Congress did not order printing up to the full amount of the working capital, which it could have done. Other balances were on account of work incompleting in the prior year and charged in full for the last fiscal year.

Mr. MURPHY. The working capital was \$2,500,000.

Mr. CARTER. Yes, sir.

Mr. MURPHY. What you have stated would not account for the difference between \$2,500,000 and the amount in the figures you gave us at the beginning of your statement.

Mr. CARTER. I should explain further that part of the \$936,988 turned back was an abnormal hang over of uncompleted work from the preceding year. We can not charge up all our work absolutely on the 1st of July, so if part of the work is done in one fiscal year and completed in the next year, the bills are collected in the year in which the work is completed.

We had last year a very large hang over of work that had not been completed in the preceding year. This was paid for in the last fiscal year, and that accounts in part for this very large surplus, which we are sure will not obtain as to the next year because there is no prospect of such a large hang over of work.

Part of that surplus, also, was profit on money orders and postal cards, which will not obtain another year, as we have reduced the charges for that work approximately \$209,000.

Mr. MURPHY. That has already been absorbed by the Budget?

Mr. CARTER. Yes, sir. We arbitrarily took a profit on postal cards and money orders to pay for the presses and other new equipment, of which the Post Office Department was advised and with which it was agreeable.

FINANCIAL STATEMENTS

Mr. MURPHY. Mr. Carter, we would like to have a financial statement of your office showing the amount of moneys paid to your office by the various Government departments and establishments for work done by you for them, showing how much you received from each department.

Mr. CARTER. I have that statement prepared.

Mr. MURPHY. We would like to have that in the record.

Mr. CARTER. I will put that in the record.

(The statement above referred to is as follows:)

Mr. MURPHY. Mr. Carter, does your office each year get out a balance sheet showing the amount of money received and expended, and for what purposes?

Mr. CARTER. Yes, sir.

Mr. MURPHY. You might put in the record the last balance sheet of your office, prepared for 1927.

Mr. CARTER. I will submit that.

(The statement above referred to is as follows:)

Resources and liabilities under appropriations for the Government Printing Office for the fiscal year ended June 30, 1927

RESOURCES

Appropriation for salaries, office of Public Printer-----	\$156, 453. 00
Appropriation for working capital-----	\$2, 400, 000. 00
Payments from all sources for printing and binding---	9, 696, 720. 67
Refunds and receipts from various sources-----	1, 918. 02
Transferred from 1924 appropriation, for estate of deceased employees (deficiency act, July 3, 1926)---	800. 00
Bills receivable July 1, 1927, for printing and binding furnished-----	762, 624. 82
	12, 862, 063. 51
Appropriation for salaries, office of Superintendent of Documents-----	382, 050. 00
Appropriation for general expenses, office of Superintendent of Documents-----	188, 400. 00
Total resources available for fiscal year 1927-----	\$13, 588, 966. 51

LIABILITIES

Salaries, office of Public Printer:	
Disbursed to June 30-----	\$141, 168. 12
Outstanding obligations, July 1, 1927-----	6, 088. 22
Total disbursed and outstanding obligations-----	147, 256. 34
Working capital and repayment for printing and binding:	
Disbursed to June 30-----	10, 501, 867. 81
Outstanding obligations, July 1, 1927-----	1, 423, 207. 46
Total disbursed and outstanding obligations-----	11, 925, 075. 27
Salaries, office of Superintendent of Documents:	
Disbursed to June 30-----	358, 308. 19
Outstanding obligations, July 1, 1927-----	16, 275. 53
Total disbursed and outstanding obligations-----	374, 583. 72

General expenses, office of Superintendent of Documents:

Disbursed to June 30-----	\$107, 076. 37	
Outstanding obligations July 1, 1927-----	71, 323. 63	
Total disbursed and outstanding obligations-----		\$178, 400. 00
Total disbursed to June 30-----	11, 108, 420. 49	
Total outstanding obligations, July 1, 1927-----	1, 516, 894. 84	
Total disbursed and outstanding obligations-----		\$12, 625, 315. 33
Unobligated balance (subject to 10 per cent over or under on outstanding orders)-----		963, 651. 18
		13, 588, 966. 51

The unobligated balance of \$963,651.18, returned to the Treasury, is made up from—

Appropriation:

Office of the Public Printer-----	\$9, 196. 66
Salaries, office of Superintendent of Documents-----	7, 466. 28
Expenses, office of Superintendent of Documents-----	10, 000. 00
Difference between charges for work for Congress, Government Printing Office, and Architect of the Capitol (\$2,232,969) and amount of working capital (\$2,400,000)-----	167, 031. 00
Excess of scale over cost of postal cards and money orders (to compensate for cost of new machinery and equipment and extra expense of abnormal requirements)-----	371, 419. 33
Charges for printing and binding mostly done in 1926 and cost carried in expense of that year but not actually completed until after beginning of fiscal year 1927 and credit taken in 1927 (this was an abnormal condition not to be expected in other years)-----	398, 537. 86
Total-----	963, 651. 18

The amounts paid for work by each Government establishment are shown in statement just submitted.

The following statement shows all expenditures by the Government Printing Office in 1927, including payments from previous appropriations on account of outstanding obligations at close of fiscal year 1926:

Recapitulation—All appropriations

Total paid for labor during fiscal year-----	¹ \$7, 685, 233. 77
Total paid for material and supplies-----	1, 208, 878. 65
Total paid for lithographing and engraving-----	125, 779. 20
Total paid for paper-----	2, 981, 195. 42
Total paid for printing and binding-----	12, 001, 087. 04
Total paid for salaries, office of Public Printer-----	² 147, 159. 84
Total paid for salaries, office of Superintendent of Documents-----	³ 373, 010. 11
Total paid for general expenses, office of Superintendent of Documents-----	191, 899. 10
Total-----	12, 713, 156. 09
Transferred to miscellaneous receipts-----	7, 891. 18
Grand total-----	12, 721, 047. 27

¹ Includes amount paid to retirement fund----- \$245, 960. 07

² Includes amount paid to retirement fund----- 4, 400. 16

³ Includes amount paid to retirement fund----- 11, 608. 75

Total paid to retirement fund----- 261, 968. 98

Mr. MURPHY. Is there anything further you would like to tell the committee in your general statement before we take up the items in the bill?

BLANK PAPER SUPPLIED DEPARTMENTS

Mr. CARTER. It may also be interesting, Mr. Chairman, to tell the committee about the amount of blank paper we have supplied the departments under a provision which the committee incorporated in the bill several years ago. For the last year it has amounted to approximately \$542,000. We are now supplying to all the departments in Washington practically all the paper they are using, and in that way they are getting the benefit of the lower prices on the larger contracts awarded through the Joint Committee on Printing.

Mr. TAYLOR. Where does this paper come from?

Mr. CARTER. It comes from all over the country, from as far west as Wisconsin and Michigan.

Mr. TAYLOR. Do you import any paper from any other country?

Mr. CARTER. There is practically no imported paper included in that.

Mr. TAYLOR. Have you ever given any thought to the practicability of the Government doing something in the way of the production of paper in Alaska or elsewhere?

Mr. CARTER. There was a bill pending before Congress for several sessions proposing the establishment of a Government paper mill, in which I was keenly interested. The Government has ample pulpwood timber in Alaska and in the northwestern part of the United States, and water-power sites, so that the only original expenditure would be for the construction and equipment of the mill.

Mr. TAYLOR. For the installation of the plant?

Mr. CARTER. Yes, sir. At that time I think it was figured that a 50-ton mill could be built for about \$1,000,000.

Mr. TAYLOR. And that was not done because of opposition to the Government going into the paper-making business?

Mr. CARTER. Yes, sir.

Mr. MURPHY. We will take up the items of the bill beginning on page 79.

SALARIES, OFFICE OF PUBLIC PRINTER

Your first item is for public printing and binding. The current appropriation for this purpose is \$2,500,000, and you are estimating the same amount for 1929.

Mr. CARTER. The first item I wish to speak of is bracketed in the bill. The effect of that would be to take out from under the classification act approximately 90 employees who are now paid under the working-capital appropriation.

Last year the committee consolidated the two items of appropriation, for the office of the Public Printer and for public printing and binding, into one item, but in the consolidation they retained language which still keeps under the classification act about 90 of our employees. That results in a discrimination against some of the employees, particularly the 90 whose salaries are fixed by the classifica-

tion board. They constitute only $2\frac{1}{2}$ per cent of the entire number of employees paid out of this particular appropriation, the other $97\frac{1}{2}$ per cent being under the Kiess Act. In some instances employees who are paid under the classification act are working side by side with those who are paid under the Kiess Act.

This provision would not increase the appropriation at all, and would affect only a small group of employees.

Mr. TAYLOR. You say it would not affect the total amount of the appropriation?

Mr. CARTER. No, sir; it would not.

Mr. TAYLOR. And you feel that along the line of systematic and orderly conduct of the office that matter ought to be adjusted?

Mr. CARTER. Yes, sir. I would be glad if the committee would give careful consideration to that at this time.

Mr. SANDLIN. In other words, 90 of your employees are under the classification act?

Mr. CARTER. Yes, sir; as the language now stands in the bill it keeps the 90 employees under the classification act.

Mr. SANDLIN. And all the rest of your employees are under the Kiess Act?

Mr. CARTER. Yes, sir; $97\frac{1}{2}$ per cent of them are under the Kiess Act.

Mr. SANDLIN. Is there any reason for that situation at all?

Mr. CARTER. When the Kiess Act passed, our office was of the opinion that it took from the classification act all of the employees paid out of the appropriation for public printing and binding. We submitted the matter to the Comptroller General, who held that this group of employees were continued under the classification act because of the language in the appropriation bill, which says that it shall be in accordance with the provisions of section 3 of the legislative appropriation act relating to the classification of employees.

Mr. MURPHY. Mr. Carter, the statement you have just concluded indicates that this committee is powerless to do anything to relieve that situation. It is a matter that should be taken up with the legislative committee, is it not?

Mr. CARTER. We think quite the contrary. The language which keeps these employees under the classification act is inserted in this appropriation act. If you were to leave out that language they would automatically come under the Kiess Act.

Mr. MURPHY. Then it is your judgment that, if this language in brackets were left out, those 90 employees who are now under the classification act would automatically come under the provisions of the Kiess Act?

Mr. CARTER. Yes, sir; that would remove the restriction.

Mr. MURPHY. Is that according to the comptroller's ruling?

Mr. CARTER. Yes, sir; he pointed out in his ruling that it was because of the language carried in this act.

Mr. MURPHY. Will you put a copy of that ruling in the record at this time?

Mr. CARTER. It was included, in part, in the hearings last year, and I will insert the entire decision in these hearings.

(The decision referred to is as follows:)

COMPTROLLER GENERAL OF THE UNITED STATES,
Washington, August 25, 1924.

The PUBLIC PRINTER,
Washington, D. C.

SIR: I have your letter of June 26, 1924, requesting decision whether, in view of the provisions of the act of June 7, 1924, Public, No. 276, you are authorized to fix rates of pay for all employees and officers of the Government Printing Office, notwithstanding the provisions of the classification act of 1923.

The act of June 7, 1924, Public, No. 276, provides as follows:

"That on and after July 1, 1924, the Public Printer may employ, at such rates of wages and salaries, including compensation for night and overtime work, as he may deem for the interest of the Government and just to the persons employed, except as otherwise provided herein, such journeymen, apprentices, laborers, and other persons as may be necessary for the work of the Government Printing Office; but he shall not at any time employ more persons than the necessities of the public work may require, or more than two hundred apprentices at any one time: *Provided*, That on and after July 1, 1924, the minimum pay of all journeymen printers, pressmen, and bookbinders employed in the Government Printing Office shall be at the rate of 90 cents an hour for the time actually employed: *Provided further*, That except as hereinbefore provided, the rates of wages, including compensation for night and overtime work, for more than ten employees of the same occupation shall be determined by a conference between the Public Printer and a committee selected by the trades affected, and the rates and compensation so agreed upon shall become effective upon approval by the Joint Committee on Printing; if the Public Printer and the committee representing any trade fail to agree as to wages, salaries, and compensation, either party is hereby granted the right of appeal to the Joint Committee on Printing, and the decision of said committee shall be final; the wages, salaries, and compensation determined as provided herein shall not be subject to change oftener than once a year thereafter: *Provided further*, That employees and officers of the Government Printing Office, unless otherwise herein fixed, shall continue to be paid at the rates of wages, salaries, and compensation (including night rate) now authorized by law until such time as their wages, salaries, and compensation shall be determined as hereinbefore provided.

"SEC. 2. All acts or parts of acts in conflict with the provisions of this act are hereby repealed."

Section 2 of the classification act of March 4, 1923 (42 Stat. 1488), expressly includes the Government Printing Office, and under the clerical-mechanical service of that act there is included—

"* * * All classes of positions which are not in a recognized trade or craft and which are located in the Government Printing Office * * *."

The act of June 7, 1924, Public, No. 225, making appropriations for the legislative branch of the Government for the fiscal year ending June 30, 1925, provides (pp. 13, 14, and 15), under the major heading of "Government Printing Office," three subheadings, viz, "Office of Public Printer," "Public printing and binding," and "Office of Superintendent of Documents." Under the first subheading is the following:

"Salaries: Public Printer, \$6,000; Deputy Public Printer, \$4,500; for personal services in accordance with the classification act of 1923, \$147,380; in all, \$157,880."

Under the second subheading is provided the working capital for the execution of printing, binding, lithographing, engraving, and other authorized work of the Government Printing Office for the various branches of the Government, including provision for salaries, compensation, and wages.

Under the third subheading is the following:

"For the Superintendent of Documents, assistant superintendent, and other personal services in accordance with the classification act of 1923, \$339,960."

As Public, No. 276, and Public, No. 225, were approved the same day, June 7, 1924, it is necessary, if possible, to so construe their provisions as to give effect to both.

Public, No. 276, deals with employment of "journeymen, apprentices, laborers, and other persons as may be necessary for the work of the Government Printing Office." It fixes the minimum pay on and after July 1, 1924, of "all journeymen printers, pressmen, and bookbinders." It provides for adjustment in the

rates of pay, including night and overtime work, on the basis of a conference between a committee appointed by the "trades affected" and the Public Printer, subject to the approval of the Joint Committee on Printing. The entire tenor of the act indicates that it is dealing with the various tradesmen, laborers, etc., employed in the actual execution of printing, binding, etc., constituting the work of the Government Printing Office for the various branches of the Government service, under the appropriation heading "Public printing and binding." Its purpose was to enable the Public Printer, subject to the approval of the Joint Committee on Printing, to adjust wages in conference with tradesmen employed in the work of the Government Printing Office similar to the practice in private printing establishments. I find nothing in the act to indicate that it was intended to have any application to the administrative forces, such as clerks, stenographers, cataloguers, etc., appropriated for under the headings "Office of the Public Printer" and "Office of Superintendent of Documents," particularly in view of the express provision in the appropriations that such personal services shall be in accordance with the classification act of 1923. Accordingly, you are advised that the classification act is applicable to the administrative force employed under authority of the appropriations made under the subheadings "Office of Public Printer" and "Office of Superintendent of Documents," and the act of June 7, 1924, Public, No. 276, relates only to personal services employed under the authority of the appropriation "Public printing and binding," and, to that extent only, supersedes the classification act of 1923.

Respectfully,

J. R. McCARL, *Comptroller General*.

Mr. SANDLIN. That language you are proposing to omit would have been subject to a point of order as legislation on the appropriation bill, would it not?

Mr. CARTER. No, sir; I do not think so.

Mr. SANDLIN. I mean that originally it would have been subject to a point of order.

Mr. CARTER. This was originally a separate paragraph, and when the classification act was passed in 1923 all of the employees in this paragraph, except the Public Printer and the Deputy Public Printer, were included under the classification act. Then the Kiess Act was passed in 1924, and we were under the impression, and the report on the Kiess bill so indicates, that the Kiess Act applied to all of the employees of the office. However, the Appropriations Committee continued its restriction as to this particular group of employees.

Mr. MURPHY. The Kiess Act was passed before the classification act, was it not?

Mr. CARTER. No, sir; it was passed afterwards.

Mr. MURPHY. The classification act was passed in 1923. It became effective July 1, 1923.

Mr. CARTER. The Kiess Act was approved June 7, 1924, but no attention was paid to it when the legislative bill was drafted in this language.

Mr. MURPHY. Then, it is your judgment that it was just an oversight at the time?

Mr. CARTER. It was at that time, because when we raised the question with the Comptroller General as to the application of the Kiess Act, he pointed out this language to us as restricting it.

Mr. MURPHY. It is your best judgment that if this language is dropped from the bill these 90 employees will automatically come under the Kiess Act?

Mr. CARTER. Yes, sir; without doubt.

Mr. MURPHY. If that should be done, what would be the effect on the salaries of those 90 employees?

Mr. CARTER. It will probably be to increase some of them. The great bulk of these 90 employees are guards. About 50 of them are guards who now receive under the classification act \$1,140, which I think is an utterly inadequate rate of pay for men who are required to perform the duties that our guards have to perform. These are not men who sit in chairs at the doors of officials, but they actually protect and patrol a very valuable property. They not only protect property but they have to pass upon all admissions to the office. Our employees are not permitted to leave work at irregular hours without passes, because their pay is regulated by the hours they are employed. The guards have to check up very carefully by means of time clocks on every employee who passes in or out of the office at other than the regular hours. They are constantly on patrol duty throughout the entire plant, which, as you know, has a very grave fire risk in the older buildings. Our guards are not chair warmers at all, but work full eight hours a day.

Mr. TAYLOR. What would be the salary if this language were taken out of the bill?

Mr. CARTER. It would be subject to fixing by the Public Printer, with the approval of the Joint Committee on Printing. We have never been able to get the Classification Board to consider that these men were in a different status from ordinary messengers in the departments.

Mr. TAYLOR. Do I understand that the Public Printer fixes the salaries of all the employees in the Government Printing Office except these 90?

Mr. CARTER. The Public Printer fixes them with the approval of the Joint Committee on Printing; yes, sir. The rates of wages are fixed in that way.

To tell you the complete story, I will say there is also a group under the Superintendent of Documents in a similar situation, and the Superintendent of Documents will make a similar proposal as to them. The 90 employees I refer to are under the Government Printing Office proper.

MOTOR-PROPELLED VEHICLES

Mr. MURPHY. We have an item here for—

motor-propelled vehicles for the carriage of printing and printing supplies, and the maintenance, repair, and operation of the same, to be used only for official purposes, including purchase, exchange, operation, repair, and maintenance of motor-propelled passenger-carrying vehicles for official use of the officers of the Government Printing Office.

And so forth.

Can you give us a little information about that item?

Mr. CARTER. We have only two passenger-carrying cars. One of them you saw when the committee recently visited the office, and the other is a Buick car. The limitation on the purchase of other cars is \$4,000. The Cadillac car was procured when we turned in a car which Congress had provided that the War Department should transfer to our office without charge.

Mr. MURPHY. Is this \$4,000 to be used for the purchase of one automobile, or is it intended for the purchase of a number of small cars?

Mr. CARTER. It is the total expense for all of the passenger cars we buy.

Mr. MURPHY. That is all you expect to spend, whether you buy 1, 2, 3, or 4 cars?

Mr. CARTER. Yes, sir.

Mr. MURPHY. You would not use all of this money to buy one car, would you?

Mr. CARTER. No, sir; that has never been done.

NEWSPAPERS, MAGAZINES, ETC.

Mr. MURPHY. I notice that you include newspapers and magazines in this item. That is new language?

Mr. CARTER. We were subscribing for the United States Daily for the use of our proof room, on account of the large amount of information it has in connection with governmental affairs, but the Comptroller General turned down the account and we were compelled to refund the payment. We subscribe also for quite a number of trade magazines, but we are somewhat apprehensive that the Comptroller General may subsequently disallow the accounts, because they may be held to be neither books of reference nor technical books.

Mr. MURPHY. But it is necessary that you have them?

Mr. CARTER. It is absolutely essential that we get the trade magazines. They are most valuable. It is not the purpose under this language to subscribe for any ordinary newspapers.

Mr. MURPHY. It is for the purpose of procuring technical and informative literature?

Mr. CARTER. Yes, sir. If the committee thinks it would make it clearer, you could put the word "and" between the word "newspapers" and the word "magazines," so that it will read "directories, technical books, newspapers, and magazines." We have never subscribed for any ordinary newspapers and magazines.

Mr. TAYLOR. I think the United States Daily would furnish you a lot of information.

Mr. CARTER. Yes, sir; it is very valuable for our proof readers.

FURNISHING INKS, GLUES, AND OTHER SUPPLIES TO GOVERNMENT DEPARTMENTS

Mr. MURPHY. You have another item for furnishing inks, glues, and other supplies manufactured by the Government Printing Office in connection with its work to departments and other establishments of the Government upon requisition. Will you give us a statement in regard to that activity?

Mr. CARTER. That provision was put in a year or two ago, and I was under the impression then that it was permanent law, but I notice it is continued in this appropriation. I would like to know whether, in the opinion of the committee, it is permanent law; and if so, whether it would not be advisable to take it out from this bill? However, if there is any doubt about its being permanent law, I strongly recommend that it be included again.

Under that provision we are supplying the departments with many of the materials that we make for our own use. During the first year we saved the departments approximately \$20,000 of the prices they would have had to pay for the same materials if procured commercially. I think the savings will eventually run to \$35,000 or \$40,000 a year.

Mr. MURPHY. Does that represent the total sales under this item?

Mr. CARTER. No, sir; the total savings.

Mr. MURPHY. What are the total sales?

Mr. CARTER. Do you mean the total cost to us?

Mr. MURPHY. No; the total sales of these various manufactured articles.

Mr. CARTER. I can submit a detailed report covering that by prices and quantities.

Mr. MURPHY. Let your statement show the total amount of money received from the sales, and the savings, if any, to the Government.

Mr. CARTER. The Government Printing Office charge was \$13,976.57, and the cost of the articles, if they had been procured commercially, would have been \$34,059.87, showing a saving of \$20,083.30. I will insert in the record a statement of that in detail.

(The statement referred to is as follows:)

Record of miscellaneous materials furnished to all Government agencies, fiscal year 1927

Kind of material	Amount furnished	Government Printing Office charge	Cost to depart- ments through former channels	Savings to Govern- ment
Printing inks:				
Black—				
Canceling.....	1,200 pounds.....	\$600.00	\$1,200.00	\$600.00
Miscellaneous.....	604 pounds.....	273.15	500.60	227.45
Colored—				
Snuff brown.....	590 pounds.....	354.00	590.00	236.00
Other colors.....	66 pounds.....	43.55	86.85	43.30
Multigraph inks:				
Black—				
Grade A.....	772 pounds.....	424.60	1,003.60	579.00
Grade B.....	195 pounds.....	48.75	253.50	204.75
Colored.....	142 pounds.....	104.80	344.05	239.25
Mimeograph inks:				
For open cylinder machines..	4,716 pounds in 4-pound cans....	2,593.80	7,074.00	4,480.20
Do.....	7,129 pounds in 1-pound cans....	4,277.40	10,693.50	6,416.10
For closed cylinder machines..	1,534 pounds in 4-pound cans....	843.70	2,301.00	1,457.30
Do.....	3,779 pounds in 1-pound cans....	2,267.40	5,668.50	3,401.10
Numbering-machine inks:				
Red.....	51 pounds.....	233.75	815.67	576.92
Blue.....	66 pounds.....			
Black.....	72 pounds.....			
Stamp-pad inks:				
Red.....	240 pounds.....	497.65	614.42	116.77
Blue.....	152 pounds.....			
Black.....	584 pounds.....			
Green.....	4 pounds.....			
Writing inks:				
Blue-black for fountain pen and office use.....	227½ gallons in quart bottles....	182.00	962.37	449.60
Do.....	869 gallons in gallon or larger containers (not including con- tainers).....	330.72		
Blue-black record.....	62 gallons in quart bottles.....	59.72	148.96	57.24
Do.....	50 gallons in gallon or larger containers (not including con- tainers).....	32.00		
Red.....	47 gallons in quart bottles.....	26.32	246.68	121.66
Do.....	91¾ gallons in pint bottles.....	73.40		
Do.....	126½ gallons in gallon or larger containers.....	25.30		
Molded glues.....	1,422 pounds.....	191.91	318.90	126.99
Miscellaneous:				
Flour paste.....	4,070 pounds.....	122.10	191.29	69.18
Ink solvent.....	5 gallons.....	6.25	17.50	11.25
Addressograph inks:				
Black.....	309 pounds.....	309.00	843.57	534.57
Blue.....	11 pounds.....	11.00	36.96	25.96
Purple writing ink for duplicators..	4½ pounds.....	9.00	18.00	9.00
Total.....		13,976.57	34,059.87	20,083.30

Mr. MURPHY. We have quite an elaborate and detailed statement in the bill here showing the number of employees, the salaries, and the various activities of the people employed in your establishment. Is there anything further that you would like to add to what is now in the bill in that regard?

Mr. CARTER. No, sir; in the estimate we submitted we covered as thoroughly as we could the probable needs of the office for the coming fiscal year. Of course, you recognize that the organization of our office is absolutely dependent upon the amount of funds that are appropriated to the other departments for printing and binding. We can only guess at that, or approximate it from past experience. We can only estimate the total amount that will be provided. Our organization is based upon what we think Congress may do in the way of appropriating to the departments for printing and binding for the coming fiscal year and also upon what the requirements were last year.

Mr. MURPHY. Do you believe that this amount of \$2,500,000 is a sufficient working capital for your activities in 1929?

Mr. CARTER. I think it is, in view of what we spent last year. In the coming year or the year following we will have considerably increased expenditures on account of the addition to the building which has been authorized by the Public Buildings Commission. The commission authorized \$1,250,000 for an addition to the Government Printing Office. The land for that addition has been condemned, and contracts for the building will be awarded within the next few months. Of course, there will be a heavy expense in moving and getting additional equipment, outside of the cost of construction itself.

Mr. HOLADAY. Where is that building to be located?

Mr. CARTER. It will be west of the main building on G Street. It will increase our square foot space about 20 per cent. We have now about 750,000 square feet, and the addition will make the total about 913,000 square feet.

Mr. HOLADAY. How much of your present building is fireproof?

Mr. CARTER. All of the main building is fireproof. It is only the old portion of the building on North Capitol Street, at H Street, that is a bad fire risk. We do not propose to take down that building at this time, on account of the fact that it is partly filled with shops—electrical, carpenter, machine, pipe-fitting, etc.—all of which are to be moved over into the new addition, which will be fireproof. Then, at some other time the question will come before Congress as to taking down the old building and replacing it with an adequate fireproof warehouse. The logical move seems to be now to erect the addition so that we can get the shops permanently located without having to put them in rented space for the time being.

Mr. MURPHY. There is no provision made in this bill for any money that you might need in transferring the machinery and for making the other needed adjustments.

Mr. CARTER. Yes, sir; that can be used out of our working capital, or out of funds coming from other departments. We include the whole cost of operation in our charges for printing and binding.

Mr. MURPHY. It will be charged up, then, under the cost of printing?

Mr. CARTER. Yes, sir; under the cost of printing; but, in order to make sure that we will have adequate funds, I think the working capital should be kept up to \$2,500,000.

COOPERATION WITH PRIVATE ESTABLISHMENTS

Mr. MURPHY. Is there anything else?

Mr. CARTER. I have just one minor amendment I would like to propose to the committee. It is subject to a point of order, but is such a minor question that I doubt whether the point would be raised. This amendment provides for cooperation with commercial industries in perfecting standards, testing supplies, and developing specifications for various printing materials. This privilege is now enjoyed by practically all of the other branches of the Government service. A number of years ago the executive departments and a number of specifically named establishments, including "any hereafter established," were granted the privilege of cooperating with organizations, like farmers' associations cooperating with the Department of Agriculture and manufacturers cooperating with the Bureau of Standards; but, on account of the fact that the Government Printing Office was not a part of any executive department, it was excluded from the privilege. Nor did the Government Printing Office come under the provision that the privilege of cooperation should apply to any bureau "established hereafter," because our office was already in existence. The Bureau of Standards itself just got in under the wire by being established the next day after this act passed.

I want to ask permission of the committee to include a proviso that this act in question shall also apply to the Government Printing Office, so that we can cooperate with the typothetæ and other businesses and industries interested in the work of the Government Printing Office. I have now a proposition on my desk from the American Newspaper Publishers' Association for cooperation in the investigation of paper, type metals, inks, etc. It is a work that we must undertake for our own printing office, and it is felt that the printers of the country are entitled to the benefit of our experience. It will be just the same as the cooperation between farmers' organizations and the Department of Agriculture and that of business men with the Bureau of Standards.

The organizations would furnish funds to meet whatever additional expense there might be in the operation of the joint investigations. This is the kind of work that is done by the Bureau of Standards in a very large way now.

If it were not for the restriction in the law applying it only to specific branches of the service and to establishments created afterwards, we could proceed with the work the same as all other establishments of the Government. For instance, there are included now all the executive departments, the Library of Congress, the Museum, the Patent Office, the Bureau of Education, the Bureau of Ethnology, the Bureau of Standards, the Botanic Garden, the Coast and Geodetic Survey, the Naval Observatory, the Zoological Park, etc. We are the only one not granted that permission under the law.

Mr. SANDLIN. What additional cost would be involved?

Mr. CARTER. No additional cost.

Mr. MURPHY. What provision of law do you propose?

Mr. CARTER. I will hand it to you. As a matter of fact, we have been doing some of this cooperative work with the United Typothetæ of America, but it has been called to my attention that other departments have specific authority of law to do it, and I feel reluctant to go ahead unless we are included in the law.

Mr. MURPHY. This, of course, is legislation and subject to a point of order.

Mr. CARTER. Yes, sir. This amendment which I ask to have inserted as a new paragraph at the bottom of page 91, reads as follows:

Section 91, chapter 5, title 20 of the Code of Laws of the United States is hereby amended so as to include and apply to the Government Printing Office.

The section of the code referred to in the above amendment reads as follows:

SECTION 91. Literary and scientific collections accessible to investigators and students.—The facilities for study research and illustration in the Government departments and in the following and any other governmental collections now existing or hereafter to be established in the city of Washington for the promotion of knowledge shall be accessible, under such rules and restrictions as the officers in charge of each department or collection may prescribe, subject to such authority as is now or may hereafter be permitted by law, to the scientific investigators and to duly qualified individuals, students, and graduates of any institution of learning in the several States and Territories and the District of Columbia, to wit:

1. Of the Library of Congress.
2. Of the National Museum.
3. Of the Patent Office.
4. Of the Bureau of Education.
5. Of the Bureau of Ethnology.
6. Of the Army Medical Museum.
7. Of the Department of Agriculture.
8. Of the Bureau of Fisheries.
9. Of the Botanic Gardens.
10. Of the Coast and Geodetic Survey.
11. Of the Geological Survey.
12. Of the Naval Observatory.
13. Of the Zoological Park. (Apr. 12, 1892, No. 8, 27 Stat. 395; Mar. 3, 1901, c. 831, 31 Stat. 1039.)

OFFICE OF SUPERINTENDENT OF DOCUMENTS

GENERAL STATEMENT

Mr. MURPHY. The next item is for the office of Superintendent of Documents. Mr. Tisdell, are you prepared to make a short statement regarding the activities of your office?

Mr. TISDELL. Yes, sir. As an introduction, I will make a concise statement of the functions of the office. The office was created in 1895 for the purpose of having general supervision over the distribution of Government publications. This distribution now involves over 10,000,000 copies of publications sold a year, and the mailing for the departments runs anywhere from 45,000,000 to 50,000,000 publications a year. In addition to our distributing activities, we are a central office of information in answering letters of inquiry involving all publication of the Government, which last year totaled about 175,000 letters.

We also publish the official catalogues, which include a monthly catalogue covering all the publications printed during the period of one month, the document index, indexing congressional documents and reports for each session of Congress, and the document catalogue, published at the close of each Congress, which is a comprehensive index of all the publications, both departmental and congressional, that are printed.

Those are the major activities of the office. Other duties may be summarized as follows: (a) Distributing publications to depository libraries; (b) compiling bibliographies and price lists; (c) receiving all accumulations of Government publications from the departments and annually taking over their surplus for distribution; (d) maintaining the most complete library in the United States of all Government publications; (e) maintaining a reference catalogue containing general and specific information concerning the work and publications of the Government departments.

Mr. TAYLOR. How do those activities at the present time compare with those of the past year, or several years back? Are they increasing, diminishing, or simply holding their own?

Mr. TISDEL. There is a very decided growth in the work, and when you come to the item in the appropriation where additional money is requested, I will tell you something of that increase. From a little group of less than 50 employees in 1895, the force has grown to about 280, and from about 3,000 publications sold during the first year of its activity, the total has mounted to nearly 10,000,000, swelling the cash receipts from \$1,000 during the first year to approximately \$600,000 for the fiscal year ending June 30, 1927.

Mr. TAYLOR. Go ahead and make any statement you like concerning this matter, and which you think should go into the record, in the way of giving us preliminary information. Of course, Congress likes to know of the activities of the different departments, what you are doing, and what you are there for.

Mr. TISDEL. The sale of Government publications is decidedly on the increase. Years ago there was a feeling in the departments that publications should be given away, but that thought is being replaced with the idea that better use is made of the publications when paid for, and, besides, it is the only way of eliminating waste. Converting the department to the sales idea has been slow work, but our advocacy of such a policy over a long period of years is gaining support throughout the various departments, with the inevitable result of increased sales. The Department of Commerce has curtailed its free distribution so that now only those who are collaborating with their department, libraries and other institutions are receiving copies without charge. In place of this free distribution, they are sending out thousands of circulars announcing publications and advising the public that they can be obtained from the office of the Superintendent of Documents at a nominal price.

The Director of the Budget, General Lord, is very much interested in the sale of documents, and I am sure he advocates that policy for all the departments when they appear before him in connection with estimates for printing and binding.

Mr. TAYLOR. Is there anything further in a preliminary way that you wish to say before taking up the items?

Mr. TISDEL. There has been an increasing demand for additional service both by the public and the libraries. The public is impatient when delayed in receipt of publications ordered and each year there is a material growth in deposit accounts which now number about 2,500 and besides there is a noticeable growth in continuation orders whereby various publications will be sent as issued. The libraries are taking more interest in Government publications as a result of a wider public interest in their contents and, as our office makes distribution to the designated depositories they naturally look to us for assistance.

The American Library Association since 1919 has been advocating a library information service, and, although several bills have been introduced and some favorably reported, none of them as yet became a law. It is their desire to establish a separate unit in our office to handle this service, which includes the preparation of bibliographies, a weekly list of selected publications to go out to the libraries, and to assist in educating the librarians to use and disseminate the knowledge that is in the publications. It was their intention to have a bill introduced covering that field at this session, but my latest information is that they have been persuaded by the Joint Committee on Printing to accept our present facilities, and I understand they would be satisfied as a starter if our office would issue weekly a selected list of publications. I mention these facts so that the committee might know something of the demands being made on our office.

Mr. MURPHY. Your office, Mr. Tisdell, is the Government bookstore, is it not?

Mr. TISDEL. Yes, sir.

Mr. MURPHY. And from your office the free distribution of documents is made?

Mr. TISDEL. We perform the mailing operations only in the free distribution by the department. The designation of those who receive those copies comes from the departments.

Mr. MURPHY. But it is handled through your office?

Mr. TISDEL. Yes, sir.

PAY OF LABORERS

Mr. MURPHY. I notice you have some additional language here, and you have omitted some language. It seems that you have in your activity two different sets or groups of employees, or employees working under different pay plans, one coming under the classification act and the other under the Kiess Act. Would you state at this time why this happened and how?

Mr. TISDEL. At the present time all of our employees come under the classification act, and the recommendation I have made here is to exclude from the operations of the classification act a certain class of our employees who work eight hours a day, so that their pay may be fixed by the Public Printer under the Kiess Act.

Mr. MURPHY. Has this matter been passed upon by those who have the authority to take care of it? Does the Budget Bureau look after it?

Mr. TISDEL. No, sir. Our estimates are submitted through the Budget Bureau but they do not review them, that being left to Congress.

The purpose of this change is to allow our laborers to be paid the same rate of pay that is now paid to this class of employees in other divisions of the Government Printing Office. Last year that difference in pay was explained to the committee, and they evidently were in sympathy with the proposition, because they favorably recommended in the bill a sufficient sum for our office to equalize this pay discrepancy.

Unfortunately, after the money was granted, the Personnel Classification Board refused to reallocate our laborers so that they might receive the 55 cents per hour rate. When we explained to them the condition they agreed it was not one to make for efficiency, and, besides, one that naturally would result in a great deal of dissatisfaction. However, they claimed it was a matter that ought to be remedied by Congress. The situation now is, we received the money to make the advance but were unable to expend it, and can not until this class of employees is taken from under the classification act.

Mr. MURPHY. In other words, the Personnel Classification Board has passed adversely upon the present arrangement?

Mr. TISDEL. They have refused to change their grade so as to allow them to receive 55 cents per hour, the same as all other laborers in the Government Printing Office.

Mr. MURPHY. They have passed on this law and denied you the right to advance these employees to 55 cents per hour?

Mr. TISDEL. Yes, sir; they have denied it. They said it was a matter that would have to be adjusted by Congress, although I was of the opinion their classification should be changed from the present grading of clerical-mechanical 1 to clerical-mechanical 2, which would permit the 55 cents per hour rate of pay. At the present time, under clerical-mechanical 1, 50 cents per hour is the maximum that can be paid.

Mr. MURPHY. This is clearly a piece of legislation is it not?

Mr. TISDEL. No; only a change in the wording of what was originally written by your committee in an appropriation act. I believe it was originally intended that the Kiess Act would be applied to all employees in the Government Printing Office. This class of employees is working eight hours per day and if they are doing the same kind of work as other employees in the Government Printing Office they should receive the same rate of pay.

Mr. MURPHY. Mr. Tisdel, you appreciate the fact that this is clearly a piece of legislation, and it has been the policy of this subcommittee, under the instructions of our chairman, not to touch anything in the way of legislation. It looks as though this might be a piece of corrective legislation, and if the purpose of it were frankly stated by the committee to the House, a point of order might not be raised against it. However, that is a matter that the committee will have to take care of in executive session. The committee will decide then what to do with reference to this matter.

Mr. TISDEL. Of course, you understand it is impossible to prevent unrest and dissatisfaction when our laborers are paid 50 cents per hour, while those with whom they are associated in other divisions in

the Government Printing Office, doing the same class of work, and who are rated just the same, so far as their civil-service status is concerned, are receiving 55 cents per hour.

Mr. MURPHY. What change in the amount of money required for this activity would be made if these employees were transferred from the classification act to the Keiss Act?

Mr. TISDEL. The change involves \$8,764.

Mr. MURPHY. It would increase the estimate by \$8,000?

Mr. TISDEL. No, sir; we have it. It has already been appropriated, but it remains unexpended until the change can be made. You have allowed the increase.

Mr. MURPHY. This legislation suggested by you is intended only as a matter of fairness to employees doing the same kind of work in the same place, side by side with other employees who are working under a different law.

Mr. TISDEL. Yes, sir.

Mr. TAYLOR. It has been approved by Congress by appropriating money for that purpose.

Mr. TISDEL. Yes, sir; your committee favorably recommended an increase in the amount of money for this purpose, and it was passed.

INCREASE IN APPROPRIATION

ADDITIONAL EMPLOYEES

Mr. MURPHY. For 1929 you are asking \$465,000 as against \$420,000 appropriated for 1928. Will you tell the committee the reason for estimating this additional amount of money?

Mr. TISDEL. The additional amount of money is requested to provide additional employees for the office. In our appropriation for the present fiscal year we received nothing for additional employees, whereas the work has decidedly increased. The cash orders during last year were 43,034 more than in the previous year, and for the first eight and one-half months of this year we have received 56,000 more cash orders than during the same period last year. Conservatively stated, it will run about 75,000 this year, or a total increase in two years of about 31½ per cent in the sales orders. You might ask the question, how we are getting along with such an increase with our present force, and the answer would be that we are not getting along. We are behind, especially with our sales orders.

RECEIPTS FROM SALES

Mr. MURPHY. What were the receipts of your office last year?

Mr. TISDEL. Last year the receipts from the sales of publications were more than \$590,000.

Mr. MURPHY. According to the bill they amounted to \$594,840.25.

Mr. TISDEL. Yes, sir; that is right.

Mr. MURPHY. Or an increase of 54 per cent in four years, while the number of employees increased 14 per cent during the same four years, according to the bill.

Mr. TISDEL. There has been a greater rate of increase in the work since July 1 than ever before in the history of the office.

Mr. MURPHY. How many books and pamphlets does this represent?

Mr. TISDEL. It represents the sale of over 10,000,000 publications.

Mr. MURPHY. For last year?

Mr. TISDEL. For the last fiscal year; yes, sir.

Mr. MURPHY. At this point I would like to have you put in the record the amount of money you have received in your office each year and the number of publications sold and handled by your office.

Mr. TISDEL. That would include the free distribution for the departments?

Mr. MURPHY. Yes. Make a statement of that covering a period of five years. I would also like for you to put in a statement showing the number of employees you have had during each of those years.

Mr. TISDEL. I will supply that for the record.

	Number of em- ployees	Number of cash orders	Receipts from sales	Number of publica- tions sold	Total dis- tribution including sales and depart- mental
1922-23.....	234	338, 821	\$382, 368. 18	6, 623, 069	56, 037, 433
1923-24.....	239	372, 987	440, 904. 93	7, 244, 741	57, 919, 339
1924-25.....	256	375, 571	487, 922. 63	7, 770, 782	59, 338, 927
1925-26.....	267	374, 915	544, 937. 51	9, 962, 571	59, 991, 408
1926-27.....	280	417, 543	594, 840. 25	10, 461, 157	60, 848, 063

NOTE.—The increase in sales orders this year figured on the first 8½ months will amount to 75,000 orders, making a 31½ per cent increase in two years.

ADDITIONAL EMPLOYEES

Mr. MURPHY. If the committee should decide not to give you the \$45,000 additional asked for in this bill would it materially affect the efficiency of your office?

Mr. TISDEL. I am positive of it.

Mr. MURPHY. How many people are you asking for?

Mr. TISDEL. We are figuring on about 30 additional people.

Mr. MURPHY. You are asking for 30 more people?

Mr. TISDEL. Yes, sir.

Mr. MURPHY. What rate of pay would these people receive? If you divided the \$45,000 increase among 30 people it would be about \$1,500.

Mr. TISDEL. If I may I will insert in the record the schedule on which we base this estimate.

It has been apparent for some time that the organization of the office needed to be expanded to more efficiently handle the work, and a study of its operation was made for that purpose. The survey has progressed far enough to realize that a separation should be made in the work now supervised by the cashier, so as to confine his duties to the receipt and disbursement of cash. This would mean the creating of a bookkeeping section to handle all book records, ledger accounts, and the auditing and analysis of cash mail.

At the present time the clerks connected with the cashier and bookkeeping section are used in the opening of the mail, to the detriment of their own work, and we are therefore asking an appropriation

for a separate group of employees to handle exclusively the opening of the mail.

It is also necessary to create a section to be charged with the responsibility of ordering the sales stock, which involves the expenditure of approximately \$400,000 annually. This work would require the analyzing of the sales possibilities of all publications, and the following up of stock when received for the purpose of increasing the sales by obtaining all publicity possible from the issuing offices. Besides, it would be the duty of such a section to make a continuous study of the stock for the purpose of eliminating obsolete and excess copies.

Mr. MURPHY. We would like to have that.

(The statement referred to is as follows:)

1 chief bookkeeper-----	\$2, 200. 00
1 assistant bookkeeper-----	1, 860. 00
1 chief of purchase section-----	2, 200. 00
1 assistant chief of purchase section-----	1, 860. 00
1 clerk in charge of opening mail-----	1, 500. 00
2 mail openers, at \$1,140-----	2, 280. 00
3 reference clerks, at \$1,680-----	5, 040. 00
2 checkers, at \$1,500-----	3, 000. 00
2 stenographers, at \$1,500-----	3, 000. 00
2 label writers, at \$1,320-----	2, 640. 00
1 ledger clerk-----	1, 500. 00
1 refund clerk-----	1, 320. 00
1 stencil cutter-----	1, 200. 00
2 revisers of subscriptions, at \$1,500-----	3, 000. 00
2 stockkeepers, at \$1,377.20 (55 cents per hour)-----	2, 754. 40
2 assemblers of cash orders, at \$1,502.40-----	3, 004. 80
5 wrappers, at \$1,377.20-----	6, 886. 00
Total-----	45, 245. 20

Mr. TAYLOR. Would these employees be selected from the civil-service register, or how would you obtain them?

Mr. TISDEL. All of them would be civil-service employees. There might be some employees promoted in the office, but others would come in under the civil-service regulations to take their places.

Mr. MURPHY. If you received this additional amount of money, and employed these 30 people, would it enable you to get out the documents in less time than now?

Mr. TISDEL. Yes, sir.

Mr. MURPHY. Very materially less?

Mr. TISDEL. Yes, sir; unless we shall be handicapped by a still further increase in the business, or more than is anticipated at the present time. Of course, that is an entirely unknown factor, and we have no emergency fund with which to meet those conditions as they arise.

Mr. MURPHY. The figures you give here are given with the expectation that the activities of the office will grow somewhat, and this will absorb a certain percentage of the growth, as well as take care of the drag?

Mr. TISDEL. It will take care of a reasonable growth. This year we have had an exceptional increase, which I do not anticipate will continue.

Mr. TAYLOR. What is the reason for that?

Mr. TISDEL. Probably it is because of more publicity, although there is no paid publicity. More of the trade journals and newspapers are paying attention to Government publications than before. There is not a day there does not come to my desk one or more copies of trade journals that will be marked, and those journals will devote 3 or 4 inches of space to the review of publications, at the same time indicating the price at which they are sold by our office.

Mr. TAYLOR. At the present time you say you are somewhat behind in sending out pamphlets and documents that you have for free distribution. If we were to give you this additional amount of money, would you be enabled to overcome that difficulty, and you would get these pamphlets and documents in the mail within a reasonable time?

Mr. TISDEL. That is my belief.

Mr. TAYLOR. There is some complaint now among Members of Congress at the delay, especially, in sending out free publications, such as farmers' bulletins, etc.

Mr. TISDEL. Yes, sir. I read in the record what Mr. Cochran said on the floor of the House. He suggested that Congress should give the Agricultural Department more money to enable them to employ additional people so that they could prepare their orders more promptly. That is very true, and the Agricultural Department is probably behind in its work anywhere from six to seven days. However, that would only be a partial remedy. It would be useless to provide the necessary facilities to eliminate delay in the publication division of the Department of Agriculture without a corresponding increase in the Government Printing Office. In a letter I addressed to Mr. Cochran I explained it takes a great deal longer to prepare 20,000 documents for mailing than it does to write an order for 20,000 and make a record of it in a book.

Mr. SANDLIN. I notice that in sending out farmers' bulletins, where there are only two or three ordered, they are placed in envelopes, without being tied up in packages. In many instances, where they have to go a considerable distance, they are torn to pieces. It seems to me that the quality of envelopes used in sending them out should be better.

Mr. TISDEL. We have had some trouble on account of the grade of envelopes used, but we are using an envelope now that is giving better service.

Mr. SANDLIN. When was that change made?

Mr. TISDEL. Within the last six months.

Mr. SANDLIN. I noticed that condition last year.

Mr. MURPHY. How long does it take your office to send out pamphlets or agricultural bulletins after you receive the franks from the Agricultural Department?

Mr. TISDEL. Under ordinary conditions, they are sent out within 24 hours. At the present time, or on last Saturday night, we were up to within 24 hours, but if the Agricultural Department should accumulate a good many orders, and send down to-day a large consignment, we might fall back two or three days. We work day and night on that particular end of the work to keep it up to date as nearly as possible.

Mr. TAYLOR. Is it necessary to have the yearbook go out as late as it does?

Mr. TISDEL. That is a question I would prefer the Public Printer would answer.

Mr. CARTER. The law now requires that the annual report of the Secretary of Agriculture shall be included in the yearbook, and, of course, that delays the publication until the Secretary of Agriculture has submitted his annual report in December of each year.

Mr. TAYLOR. It generally does not come out until about July?

Mr. CARTER. In June or July. That is entirely up to the department in getting the copy to us. They have been very slow in furnishing the copy.

Mr. TAYLOR. How long does it take you to get the yearbook out after they furnish the copy?

Mr. CARTER. We print in editions of 100,000 copies each, and we get 100,000 copies out in 35 or 40 days.

Mr. TAYLOR. Most of the delay is with the Department of Agriculture?

Mr. CARTER. The department does not submit copy for the yearbook, as a rule, until after the 1st of February. Copy was received recently for the yearbook for 1927. The Agricultural Yearbook is always published in the year following the year it is dated, thus the 1927 yearbook comes out in 1928.

COST OF DAILY INDEX ON CONGRESSIONAL RECORD

Mr. TAYLOR. How much would it cost to have a little index on the first page of the Congressional Record showing, for example, what was done, just as it appears in some of the newspapers? Many of the daily papers show on the front page what is contained in that issue of the paper; and if there could be a little index on the front page of the Congressional Record conveying like information it would relieve people of the necessity of hunting through the whole Record, like looking for a needle in a haystack to find what they are interested in?

Mr. CARTER. The expense would not be great because the Record costs only about \$50 per page; but the getting up of such an index would be an almost impossible task in the way the Record has to be printed. Members, as you know, have the privilege of holding out copy until midnight, and we must go to press between midnight and 3 o'clock in the morning. If the Record should contain 200 pages, it would be almost impossible to index it and get out in time. I would not want the job of indexer, because if we omitted some insignificant item for a particular Member of Congress, a head might come off.

Mr. TAYLOR. I have spoken about that many times, and the public generally, I think, feel that there should be something of that kind. The newspapers of the country would find it of great use to them. They do not have time to read through the entire Record to find what they want, and they frequently throw it in the wastebasket. Most of the newspapers in Colorado tell me to stop sending it to them, because they say that life is too short to go through it to find what they want. If there were such an index as I have indicated,

they could glance through it and refer to what they care to see. It would be a wonderful help to them. How many copies of the Record are published every year?

Mr. CARTER. Thirty-five thousand copies.

Mr. TAYLOR. Every day?

Mr. CARTER. Yes, sir; and there are 6,000 bound sets printed at the end of the session.

Mr. TAYLOR. You could not estimate the cost of such an index as I have indicated, and you say it is entirely impractical?

Mr. CARTER. I do not say it is entirely impractical, but it would be very difficult. I think the Joint Committee on Printing has considered that several times. They have full authority to do that now if they can be convinced that it is feasible.

INCREASE FOR CATALOGUES AND INDEXES

Mr. MURPHY. Mr. Tisdell, you are asking for \$7,000 additional this year for catalogues and indexes: Will you explain to the committee why that is necessary?

Mr. TISDELL. The \$7,000 additional is based entirely on the actual cost of the publications we are required by law to issue. I will insert a table showing the cost of the monthly catalogues for 12 months, the document index, and the document catalogue. Now, the total cost of those publications will be more than the appropriation we are asking for, but the document catalogue covers a period of two years, and we will be able to use \$12,500 of the appropriation for one year along with \$12,500 of the appropriation for next year, and in that way cover the total cost. We can make our requisition in one year, but the job will not be completed until the following year, and in that way we make available two appropriations to defray the expense.

Monthly catalogue—

July	\$422. 29
August	412. 21
September	425. 78
October	280. 93
November	418. 35
December	527. 85
January	668. 95
February	872. 15
March	640. 44
April	488. 70
May	472. 88
June	470. 00
Annual index	2, 232. 71
Document index	3, 447. 77
Document catalogue	25, 285. 24
Total	37, 066. 05

Mr. MURPHY. Does your office make any profit on the sale of pamphlets and documents sold to the public?

Mr. TISDELL. We are not supposed to make any profit, but we turn into the Treasury as miscellaneous receipts about \$200,000 every year.

Mr. CARTER. They make 10 per cent.

Mr. MURPHY. What was the total amount of business done through your office last year?

Mr. TISDEL. Do you mean the total amount of sales?

Mr. CARTER. The sales amounted to about \$594,000.

Mr. MURPHY. How much material did you order printed?

Mr. TISDEL. Our printing bills for sales publications amounted last year to \$425,975.77.

Mr. MURPHY. Will you put a statement in the record showing the full operations of your office?

Mr. TISDEL. Yes, sir; such a statement has already been requested, which will be inserted. We pay for our publications as soon as we receive them, but we may be selling those books four or five years from now.

Mr. MURPHY. Do you keep an inventory of your stock?

Mr. TISDEL. It is absolutely inventoried. We can tell down to a book how many we have in stock any time of day of the approximately 30,000,000 that we have on hand.

Mr. MURPHY. Would you be able to tell us at this time the number of books and pamphlets you have in your department and the value of the same?

Mr. TISDEL. No, sir; I can give you the number of publications, but I could not begin to give you the value.

Mr. MURPHY. You can give the number of documents in stock?

Mr. TISDEL. Yes, sir; belonging both to the departments and to our office.

Publications in stock as of June 30, 1927

	Number of copies
Departmental stock-----	28, 749, 722
Sales stock-----	3, 856, 704
Total-----	32, 606, 426

Mr. MURPHY. Mr. Carter, have you anything further that you would like to bring to the attention of the committee?

Mr. CARTER. We have nothing further, Mr. Chairman.

DIVISION OF ACCOUNTS

STATISTICAL TABLES

STATISTICAL TABLES

COMPILED BY SUPERINTENDENT OF ACCOUNTS AND BUDGET OFFICER

TABLE 1.—*Resources and liabilities under appropriations for the fiscal year ended June 30, 1927*

RESOURCES		
Appropriation for salaries, office of Public Printer.....		\$156,453.00
Appropriation for working capital.....	\$2,400,000.00	
Payments from all sources for printing and binding.....	9,696,720.67	
Refunds and receipts from various sources.....	1,918.02	
Transferred from 1924 appropriation, for estate of deceased employee (deficiency act, July 3, 1926).....	800.00	
Bills receivable July 1, 1927, for printing and binding furnished.....	762,624.82	
		12,862,063.51
Appropriation for salaries, office of Superintendent of Documents.....		382,050.00
Appropriation for general expenses, office of Superintendent of Documents.....		188,400.00
Total resources available for fiscal year 1927.....		\$13,588,966.51
LIABILITIES		
Salaries, office of Public Printer:		
Disbursed to June 30.....	\$141,168.12	
Outstanding obligations, July 1, 1927.....	6,088.22	
Total disbursed and outstanding obligations.....		\$147,256.34
Working capital and repayments for printing and binding:		
Disbursed to June 30.....	10,501,867.81	
Outstanding obligations, July 1, 1927.....	1,423,207.46	
Total disbursed and outstanding obligations.....		11,925,075.27
Salaries, office of Superintendent of Documents:		
Disbursed to June 30.....	358,308.19	
Outstanding obligations, July 1, 1927.....	16,275.53	
Total disbursed and outstanding obligations.....		374,583.72
General expenses, office of Superintendent of Documents:		
Disbursed to June 30.....	107,076.37	
Outstanding obligations, July 1, 1927.....	71,323.63	
Total disbursed and outstanding obligations.....		178,400.00
Total disbursed to June 30.....	11,108,420.49	
Total outstanding obligations, July 1, 1927.....	1,516,894.84	
Total disbursed and outstanding obligations.....		12,625,315.33
Unobligated balance (subject to 10 per cent over or under on outstanding orders).....		963,651.18
		13,588,966.51

TABLE 2.—Summary of financial transactions in fiscal year ended June 30, 1927, covering appropriations for fiscal years 1925, 1926, and 1927

APPROPRIATION FOR 1925

	Resources	Disbursements	Unexpended balance July 1, 1927
Salaries, office of Public Printer: Unexpended balance July 1, 1926.....	\$13, 848. 11		\$13, 848. 11
Public printing and binding:			
Unexpended balance July 1, 1926.....	129, 632. 61		
Refund, deposited.....	4. 00		
Disbursed for material and supplies.....		\$8, 424. 06	
Total.....	129, 636. 61	8, 424. 06	121, 212. 55
Salaries, office of Superintendent of Documents: Unexpended balance July 1, 1926.....	10, 777. 22		10, 777. 22
General expenses, office of Superintendent of Documents:			
Unexpended balance July 1, 1926.....	17, 416. 71		
Disbursed.....		17, 415. 67	
Total.....	17, 416. 71	17, 415. 67	1. 04
Grand total appropriation, 1925.....	171, 678. 65	25, 839. 73	145, 838. 92
Unobligated balance of 1925 appropriations on June 30, 1927.....			145, 838. 92

APPROPRIATION FOR 1926

Salaries, office of Public Printer:			
Unexpended balance July 1, 1926.....	\$21, 281. 00		
Disbursed.....		\$5, 991. 72	
Total.....	21, 281. 00	5, 991. 72	\$15, 289. 28
Printing presses, Government Printing Office:			
Unexpended balance July 1, 1926.....	122, 350. 00		
Disbursed.....		115, 618. 77	
Total.....	122, 350. 00	115, 618. 77	6, 731. 23
Public printing and binding:			
Unexpended balance July 1, 1926.....	1, 283, 956. 62		
For extra pay to night messengers (deficiency act, July 3, 1926).....	3, 200. 00		
Credits to appropriation by payments from all sources for printing and binding and other receipts from miscellaneous sources.....	560, 081. 28		
Transferred to miscellaneous receipts.....		7, 891. 18	
Disbursed for labor.....		229, 096. 70	
Disbursed for paper.....		785, 196. 39	
Disbursed for lithographing and engraving.....		66, 131. 61	
Disbursed for material and supplies.....		294, 751. 70	
Total.....	1, 847, 237. 90	1, 383, 067. 58	464, 170. 32
Salaries, office of Superintendent of Documents:			
Unexpended balance July 1, 1926.....	25, 543. 59		
Disbursed.....		14, 701. 92	
Total.....	25, 543. 59	14, 701. 92	10, 841. 67
General expenses, office of Superintendent of Documents:			
Unexpended balance July 1, 1926.....	67, 408. 02		
Disbursed.....		67, 407. 06	
Total.....	67, 408. 02	67, 407. 06	. 96
Grand total appropriation.....	2, 083, 824. 51	1, 586, 787. 05	497, 037. 46
Deduct for outstanding obligations.....			15, 508. 00
Unobligated balance of 1926 appropriations on June 30, 1927.....			481, 529. 46

TABLE 2.—Summary of financial transactions in fiscal year ended June 30, 1927, covering appropriations for fiscal years 1925, 1926, and 1927—Continued

APPROPRIATION FOR 1927

	Resources	Disbursements	Unexpended balance July 1, 1927
Salaries, office of Public Printer:			
Legislative act of May 3, 1926.....	\$156,453.00		
Disbursed.....		\$141,168.12	
Total.....	156,453.00	141,168.12	\$15,284.88
Public printing and binding:			
Legislative act of May 3, 1926.....	2,400,000.00		
For reimbursement of estate of deceased employee, by transfer from 1924 appropriation (deficiency act, July 3, 1926).....	800.00		
Credits to appropriation by payments from all sources for printing and binding and other receipts from miscellaneous sources.....	9,698,638.69		
Disbursed for labor.....		7,456,137.07	
Disbursed for paper.....		2,195,999.03	
Disbursed for lithographing and engraving.....		59,647.59	
Disbursed for material and supplies.....		790,084.12	
Total.....	12,099,438.69	10,501,867.81	1,597,570.88
Salaries, office of Superintendent of Documents:			
Legislative act of May 3, 1926.....	382,050.00		
Disbursed.....		358,308.19	
Total.....	382,050.00	358,308.19	23,741.81
General expenses, office of Superintendent of Documents:			
Legislative act of May 3, 1926.....	188,400.00		
Disbursed.....		107,076.37	
Total.....	188,400.00	107,076.37	81,323.63
Grand total appropriation, 1927.....	12,826,341.39	11,108,420.49	1,717,921.20
Bills receivable.....	762,624.82		762,624.82
	13,588,966.51	11,108,420.49	2,480,546.02
Deduct for outstanding obligations.....			1,516,894.84
Unobligated balance of 1927 appropriations on June 30, 1927.....			963,651.18
Total unobligated balances (subject to change by 10 per cent over or under on outstanding obligations):			
1925.....			145,838.92
1926.....			481,529.46
1927.....			963,651.18
Total.....			1,591,019.56

RECAPITULATION—ALL APPROPRIATIONS

Total paid for labor during fiscal year.....	\$7,685,233.77
Total paid for material and supplies.....	1,208,878.65
Total paid for lithographing and engraving.....	125,779.20
Total paid for paper.....	2,981,195.42
Total paid for printing and binding.....	12,001,087.04
Total paid for salaries, office of Public Printer.....	² 147,159.84
Total paid for salaries, office of Superintendent of Documents.....	³ 373,010.11
Total paid for general expenses, office of Superintendent of Documents.....	191,899.10
Total.....	12,713,156.09
Transferred to miscellaneous receipts.....	7,891.18
Grand total.....	12,721,047.27

¹ Includes amount paid to retirement fund..... \$245,960.07

² Includes amount paid to retirement fund..... 4,400.16

³ Includes amount paid to retirement fund..... 11,608.75

Total paid to retirement fund..... 261,968.98

TABLE 3.—*Moneys received during fiscal year 1927, the source, and Treasury deposit*

1925		
Deposited to the credit of appropriation for public printing and binding: Refunds..		\$4.00
Total.....		\$4.00
1926		
Deposited to the credit of appropriation for public printing and binding:		
For printing and binding for departments and bureaus.....	\$555,532.18	
For miscellaneous printing and binding.....	4,461.97	
Refunds.....	61.13	
Amount collected as damage to truck.....	17.00	
Auditor's disallowance.....	9.00	
Total.....		560,081.28
1927		
Deposited to the credit of appropriation for public printing and binding:		
For printing and binding for departments and bureaus.....	\$9,607,517.14	
For miscellaneous printing and binding.....	89,203.53	
Refunds.....	148.14	
Amount collected as damage to automobiles and trucks.....	100.25	
Amount collected for crating, drayage, etc.....	300.55	
Refund on advances for subsistence.....	1,363.25	
Auditor's disallowance.....	5.83	
Total.....		9,698,638.69
Deposited to the credit of miscellaneous receipts:		
Sale of waste paper.....	\$49,960.11	
Sale of waste metal.....	5,794.11	
Sale of waste wood.....	1,244.04	
Sale of leather scraps.....	5.02	
Sale of condemned material.....	1,051.23	
Sale of waste gold.....	1,662.20	
Sale of documents.....	131,857.74	
Total.....		191,574.45
Grand total.....		10,450,298.42

TABLE 4.—*Production of principal items entering into printing and binding in fiscal years 1925, 1926, and 1927*

Item	1925	1926	1927
Main office and Congressional Library branch:			
Total charges for printing and binding.....dollars..	11,532,954.66	11,799,074.87	13,492,314.49
Jackets written.....number..	52,731	54,074	54,168
Estimates made.....do.....	45,830	45,309	47,452
Bills computed.....do.....	66,000	67,991	72,545
Total ems set.....do.....	2,128,394,700	2,158,890,100	2,060,248,100
Time work in composing sections.....hours.....	274,609	257,288	242,836
Electrotypes and stereotypes.....square inches.....	10,447,231	10,948,121	11,356,708
Postal cards printed.....number.....	1,595,376,890	1,596,862,880	1,950,508,300
Money-order books shipped.....do.....	1,102,503	1,100,827	1,002,354
Forms sent to press.....do.....	145,005	160,345	145,831
Actual impressions.....do.....	471,384,300	465,549,492	484,678,679
Chargeable impressions.....do.....	2,129,585,506	2,056,808,214	1,960,834,989
Sheets folded by machine.....do.....	235,489,426	221,987,941	226,008,387
Signatures gathered by machine.....do.....	139,940,616	130,285,798	155,233,669
Tips made by machine.....do.....	7,217,929	9,535,440	8,250,687
Copies wire stitched.....do.....	46,426,889	47,442,436	45,115,690
Copies paper covered.....do.....	4,583,788	5,367,364	8,574,395
Books and pamphlets trimmed.....do.....	56,726,117	56,392,663	53,913,955
Books rounded and backed.....do.....	1,192,311	1,121,799	1,160,085
Books marbled and edged.....do.....	150,359	184,385	163,477
Stamping impressions.....do.....	2,742,491	2,573,041	2,736,425
Books cased in.....do.....	1,257,079	1,272,999	1,436,213
Indexes cut.....do.....	140,311	129,872	140,359
Sheets passed through ruling machine.....do.....	21,096,848	21,657,309	22,589,915
Signatures sewed.....do.....	83,821,611	71,977,215	76,210,279
Copies punched and drilled.....do.....	102,005,765	100,661,589	95,356,979
Sheets and lines perforated.....do.....	6,582,474	7,569,351	6,861,125
Tablets made.....do.....	2,850,376	2,903,111	2,889,402
Miscellaneous rebindings, etc.....do.....	93,295	92,538	102,519

¹ Includes \$800,000 estimated labor and material on uncompleted jobs.

TABLE 5.—Charges for work and to whom delivered during the fiscal year ended June 30, 1927

Congress.....	\$2,232,969.00
Work ordered by Members of Congress:	
Miscellaneous charges.....	938.24
Documents, reports, bills, etc.....	22,991.08
Speeches.....	66,272.22
Private orders for electrotypes.....	883.46
Superintendent of Documents.....	613,924.58
State.....	186,710.55
Treasury.....	927,861.17
War.....	645,415.52
Navy.....	585,019.21
Interior.....	236,488.50
Geological Survey.....	93,615.17
Smithsonian Institution.....	76,305.67
Justice.....	268,418.17
Post Office.....	2,431,370.52
Agriculture.....	997,337.83
Commerce.....	803,091.46
Patent Office.....	1,046,296.86
Labor.....	239,483.09
Library of Congress.....	320,996.47
White House.....	3,503.55
Pan American Union.....	39,630.29
Supreme Court:	
District of Columbia.....	4,850.90
United States.....	4,643.69
Court of Claims.....	32,127.53
Interstate Commerce Commission.....	219,981.06
Civil Service Commission.....	60,869.47
Geographic Board.....	428.71
General Accounting Office.....	40,603.63
Alien Property Custodian.....	3,129.72
Bureau of the Budget.....	26,575.84
District of Columbia.....	14,819.47
Employees' Compensation Commission.....	2,963.19
Federal Reserve Board.....	51,716.03
Federal Board for Vocational Education.....	8,403.87
Federal Trade Commission.....	20,999.56
National Advisory Committee for Aeronautics.....	14,978.49
Panama Canal.....	44,316.83
Railroad Administration.....	1,813.24
Board of Mediation.....	1,185.06
Shipping Board.....	90,689.30
Tariff Commission.....	17,804.88
Veterans' Bureau.....	157,600.05
War Finance Corporation.....	1,473.71
Office of Public Buildings and Public Parks.....	4,544.81
Arlington Memorial Bridge Commission.....	99.81
American Battle Monuments Commission.....	765.79
Bureau of Efficiency.....	210.60
Commission of Fine Arts.....	1,729.96
Federal Power Commission.....	3,350.24
National Forest Reservation Commission.....	311.00
National Home for Disabled Volunteer Soldiers.....	377.44
Special counsel, oil leases, etc.....	40.37
Board of Tax Appeals.....	18,237.59
National Capital Park and Planning Commission.....	493.49
National Sesquicentennial Exhibition.....	6.70
Inland Waterways Commission.....	453.86
Two Hundredth Anniversary of George Washington's Birthday.....	263.91
Federal Radio Commission.....	672.44
Panama Railroad Co.....	259.64
Total.....	12,692,314.49

TABLE 6.—Cost of production

Division, office, or section	Salaries, wages, leave, and holiday pay	Material and supplies for operation	Maintenance and upkeep	Work by other sec- tions, includ- ing proof and apprentice
Job.....	\$225,339.59	\$6,968.09	\$36,836.76	\$77,721.40
Patents.....	215,233.45	1,569.74	34,658.87	277,232.82
Linotype.....	606,277.97	7,558.60	107,603.41	665,502.04
Monotype.....	879,017.68	16,357.47	150,874.52	1,038,106.43
Hand.....	292,942.94	2,133.23	48,564.04	66,006.38
Proof.....	918,567.33	941.65	139,524.48	15,894.03
Apprentice.....	236,436.78	215.05	38,208.51	57,209.99
Plate making.....	218,817.93	15,130.13	49,041.08	28,193.12
Photo-engraving.....	63,886.28	9,777.77	12,366.86	14,613.38
Press.....	1,006,927.69	80,782.09	224,579.16	101,356.30
Pamphlet binding.....	541,304.06	7,555.58	100,445.18	181,367.87
Ruling and sewing.....	339,488.35	8,461.72	62,990.93	8,161.92
Forwarding and finishing.....	552,838.09	8,567.40	102,909.26	20,911.40
Money order.....	43,040.64	1,978.85	8,525.35	795.82
Postal card.....	112,344.65	38,814.40	60,069.49	946.47
Library printing branch.....	55,755.55	5,672.09	5,158.04	7,915.15
Library binding branch.....	125,875.11	221.43	5,601.62	363.98
Cutting and packing.....	83,947.46	4,457.59	16,164.84	403.97
Metal.....	12,811.31	21,220.63	9,978.15	536.20
Details chargeable.....	23,004.01	1.38		
Stores.....	139,000.14	1,897.90	30,334.94	107.11
Ink.....	12,021.04	23,509.79	7,232.01	
Paper stock—Press division.....				
Illustrations.....				
Outside purchases.....				
Work for stock returned to stores.....				60,714.21
Light and power for city post office.....			30,228.87	
Miscellaneous service for Superintendent of Documents—other than printing and binding.....		6,596.71	21,736.67	313.70
Total.....	6,704,878.05	270,389.29	1,303,633.04	2,624,373.69

¹ Grand total expense of all apprentices.

for the fiscal year 1927

Expense of delivery of product and storage of plates	Administrative and clerical expense	Paper and other stock issued, illustrations ordered, outside purchases vouchered	Reconciliation between issues and orders, and same items computed	Total	Credits by work for other sections	Total cost of production
\$5,422.69	\$18,880.33	-----	-----	\$371,168.86	\$30,133.27	\$341,035.59
4,695.22	17,665.00	-----	-----	551,055.10	75,543.00	475,512.10
13,184.47	49,485.52	-----	-----	1,449,612.01	123,689.87	1,325,922.14
19,110.90	72,353.61	-----	-----	2,175,820.61	283,036.79	1,892,783.82
6,532.69	24,241.26	-----	-----	440,420.54	288,745.20	151,675.34
13,477.90	75,642.38	-----	-----	1,164,047.77	1,164,047.77	-----
2,504.89	19,212.56	-----	-----	1,353,787.78	231,366.81	122,420.97
5,104.23	19,160.39	-----	-----	355,446.88	92,243.34	243,203.54
1,663.20	6,166.96	-----	-----	108,474.45	1,106.36	107,368.09
23,128.12	78,757.40	\$400.42	-----	1,515,931.18	188,871.85	1,327,059.33
7,918.61	45,195.74	9,852.28	-----	893,639.32	952.54	892,686.78
5,073.65	34,682.00	56,622.74	-----	515,481.31	2,484.41	512,996.90
8,137.53	56,263.53	145,292.48	-----	894,919.69	16,999.45	877,920.24
655.85	3,186.60	70,631.42	-----	128,814.53	440.03	128,374.50
2,288.44	11,118.88	644,217.06	-----	869,799.39	-----	869,799.39
1,312.55	4,007.17	27,529.94	-----	107,350.49	2,157.20	105,193.29
1,795.67	8,666.36	9,063.58	-----	151,587.75	9,611.39	141,976.36
1,277.43	6,377.69	475,478.34	+\$24,730.78	612,838.10	1.35	612,836.75
546.15	2,441.99	-----	-----	47,534.43	47,534.43	-----
-----	1,604.62	91.20	-----	24,701.21	-----	24,701.21
2,039.06	10,180.18	-----	-----	183,559.33	27.58	183,531.75
564.48	2,522.98	-----	-----	45,850.30	45,850.30	-----
-----	-----	1,913,499.49	+37,126.04	1,950,625.53	-----	1,950,625.53
-----	-----	109,793.96	+37,081.46	146,875.42	-----	146,875.42
-----	-----	9,142.33	+630.29	9,772.62	-----	9,772.62
-----	-----	-----	-60,714.21	-----	-----	-----
-----	-----	-----	-----	30,228.87	-----	30,228.87
1,935.96	-----	-----	-----	30,583.04	-----	30,583.04
128,369.69	567,813.15	3,471,615.24	+38,854.36	15,109,926.51	2,604,842.94	12,505,083.57

TABLE 7.—Itemized statement of the classes and cost of work delivered during the fiscal year ended June 30, 1927

Kind or description of work	Number of copies	Num-ber of type pages	Publi-cations bound	Charge for com-posing-room work except authors' alterations	Charge for authors' altera-tions	Charge for electro-typing or stereo-typing	Charge for pressroom work	Charge for bindery work	Charge for illus-trations or en-gravings	Charge for paper	Charge for rush and overtime work	Charge for miscel-laneous and con-tract items	Total charge
Letterheads, noteheads, and envelopes.....	127, 267, 264	---	---	\$19, 432. 23	\$50. 39	\$1, 569. 33	\$60, 950. 91	\$17, 029. 44	\$9. 00	\$128, 737. 86	\$68. 07	\$573. 73	\$228, 420. 96
Embossed letterheads, note-heads, and envelopes.....	661, 431	---	---	19. 96	---	2. 70	2, 739. 43	175. 60	---	2, 443. 43	21. 02	110. 34	5, 512. 48
Blanks, notices, schedules, cards, etc.....	3, 498, 950, 799	---	---	348, 263. 55	16, 188. 09	30, 487. 02	415, 989. 29	353, 516. 13	21, 715. 56	1, 513, 029. 88	6, 437. 85	553. 83	3, 261, 181. 20
Blank books with patent backs, etc.....	6, 032	---	---	4, 061. 19	54. 46	155. 56	2, 565. 61	56, 832. 44	---	14, 042. 41	---	61. 12	77, 772. 79
Blank books without patent backs.....	2, 665, 741	---	---	16, 238. 11	1, 595. 00	4, 647. 44	61, 513. 17	326, 973. 62	30. 43	115, 446. 28	227. 64	1, 865. 18	528, 536. 87
Binding newspapers, docu-ments, reports, etc.....	83, 355	---	---	---	---	---	---	304, 647. 67	---	---	47. 62	---	304, 695. 29
Loose-leaf and other patent binders, etc.....	906	---	---	---	---	---	---	2, 614. 20	---	---	---	967. 47	3, 581. 67
Publications smaller than oc-tavo.....	4, 074, 697	30, 724	19, 033	46, 672. 32	5, 062. 98	5, 144. 57	11, 809. 17	27, 477. 90	1, 632. 81	15, 177. 47	351. 46	534. 29	113, 882. 97
Octavo publications.....	74, 333, 581	722, 312	688, 189	1, 595, 425. 08	121, 787. 47	153, 232. 24	342, 458. 13	715, 611. 72	136, 827. 34	521, 467. 18	98, 017. 93	1, 691. 53	3, 685, 518. 62
Royal octavo publications.....	2, 921, 460	54, 428	31, 032	149, 065. 47	17, 667. 77	10, 028. 93	30, 559. 80	42, 069. 99	12, 491. 65	31, 553. 18	9, 979. 90	653. 93	304, 070. 62
Quarto publications.....	6, 090, 759	173, 678	34, 098	395, 194. 71	23, 885. 74	24, 545. 68	54, 828. 64	93, 855. 98	32, 043. 08	86, 272. 41	7, 803. 12	250. 49	718, 679. 85
Miscellaneous publications.....	17, 163, 605	891, 822	250, 344	43, 446. 42	3, 775. 83	3, 355. 78	76, 355. 59	218, 978. 86	13, 847. 02	151, 066. 46	365. 83	69, 100. 56	580, 292. 35
General miscellaneous charges.....	---	---	---	35, 892. 08	6, 519. 53	18, 373. 83	16, 631. 49	114, 559. 47	27, 992. 94	143, 939. 63	1, 673. 47	184, 899. 47	550, 481. 91
Congressional Record for year.....	3, 913, 240	22, 101	57, 960	123, 576. 81	14, 503. 66	46, 749. 83	62, 845. 26	166, 114. 46	87. 01	82, 348. 02	55, 008. 82	---	551, 233. 87
Bills, resolutions, and amend-ments (as introduced, and reprints on requisitions).....	4, 477, 880	54, 855	825	134, 272. 49	4, 058. 92	3, 197. 11	43, 847. 53	8, 661. 70	---	6, 357. 49	48, 504. 32	---	248, 899. 56
Specifications of patents, trade-marks, etc.....	5, 602, 084	148, 914	---	637, 880. 76	8, 711. 25	26. 28	61, 951. 15	3, 683. 96	---	12, 513. 43	---	---	724, 769. 83
Official Gazette, Patent Office.....	3, 337, 007	16, 174	---	157, 236. 43	121. 36	2. 00	23, 434. 71	21, 112. 32	17, 315. 36	27, 292. 60	---	---	246, 514. 78
Blank paper and supplies.....	---	---	---	---	---	---	---	---	---	500, 154. 93	---	58, 113. 94	558, 268. 87
Total.....	3, 748, 549, 841	2, 115, 008	1, 081, 481	3, 706, 677. 61	223, 982. 45	301, 518. 30	1, 208, 479. 88	2, 473, 918. 46	263, 012. 20	3, 351, 842. 66	228, 507. 05	874, 375. 88	12, 692, 314. 49

TABLE 8.—*Inventory of quantity and cost of paper and envelopes, material and supplies, and machinery and equipment on hand June 30, 1927*

Description	Sheets	Pounds	Cost
Paper and envelopes:			
Printing.....	13,375,000		\$107,615.68
Do.....		1,383,000	70,504.30
Mimeograph.....	4,214,000		18,752.69
United States money-order writing.....		157,400	17,807.30
Safety writing.....	119,000		1,212.26
Writing.....	8,586,000		43,731.68
Do.....		196,000	12,078.00
Map.....	373,000		7,519.72
Manifold.....	6,422,000		33,620.50
Do.....		9,000	1,762.20
Bond.....	10,716,000		153,894.34
Ledger.....	3,050,000		63,043.84
Index.....	461,000		19,204.40
Cover.....	1,646,000		33,292.51
Manila.....	1,059,000		9,606.95
Do.....		113,000	4,818.80
Kraft.....	1,537,000		13,407.92
Do.....		99,000	3,356.00
Manila tag board.....	326,000		6,172.00
Do.....		244,000	21,631.00
Cardboard.....	141,000		4,110.34
Bristol board.....	548,000		5,489.24
Do.....		1,180,000	63,502.44
Miscellaneous.....	1,592,000		10,335.28
Do.....		18,200	2,284.00
Binder's board.....		526,000	16,108.20
Envelopes.....			24,778.70
Total, paper and envelopes.....			771,140.29
Other material and supplies:			
Miscellaneous supplies.....			210,748.97
Book cloth.....			24,876.89
Ink ingredients.....			7,382.96
Leather.....			10,434.27
Ink (made in Government Printing Office).....			3,326.84
Total, material and supplies.....			256,769.93
Total, material and supplies, paper and envelopes.....			1,027,910.22
Machinery and equipment:			
Machinery.....			3,751,057.36
Equipment.....			363,793.08
Total, machinery and equipment.....			4,114,850.44
Grand total.....			5,142,760.66

TABLE 9.—*Publications, including annual reports and documents, printed on requisition during the fiscal year ended June 30, 1927, for Government departments and independent establishments (Congress not included)*

	Copies
State.....	383,799
Treasury.....	5,099,908
War.....	11,820,025
Navy.....	1,983,537
Interior.....	2,710,106
Justice.....	53,644
Post Office.....	1,752,978
Agriculture.....	32,086,091
Commerce.....	3,900,186
Labor.....	1,806,354
Smithsonian.....	184,287
Library of Congress.....	152,098
White House.....	60,762
Pan American Union.....	231,903
Supreme Court:	
District of Columbia.....	1,016
United States.....	15,355
Court of Claims.....	5,075
Bureau of Efficiency.....	1,128
Federal Power Commission.....	7,107
Interstate Commerce Commission.....	1,832,980
Civil Service Commission.....	232,167
Geographic Board.....	9,950
General Accounting Office.....	12,803
Alien Property Custodian.....	663
District of Columbia.....	22,594
Employees' Compensation Commission.....	17,258
Veterans' Bureau.....	962,959
Federal Board for Vocational Education.....	65,152
Federal Reserve Board.....	524,416
Federal Trade Commission.....	54,917
National Advisory Committee for Aeronautics.....	31,620
Panama Canal.....	2,638
Railroad Administration.....	1,513
Shipping Board.....	487,151
Tariff Commission.....	20,320
Board of Mediation.....	2,531
National Forest Reservation Commission.....	1,500
War Finance Corporation.....	1,200
Commission of Fine Arts.....	526
Bureau of the Budget.....	60,545
Public Buildings and Public Parks.....	733
Miscellaneous.....	27,229
Total.....	66,628,724

TABLE 10.—*Receipts from miscellaneous sales during the fiscal year ended June 30, 1927*

Condemned material, machinery, etc.....	\$1,051.23
Waste wood.....	1,244.04
Waste metal.....	5,794.11
Waste paper.....	49,960.11
Leather scraps.....	5.02
Waste gold.....	1,662.20
Total.....	59,716.71

DIVISION OF TESTS AND TECHNICAL CONTROL
(FORMERLY TESTING SECTION)

REPORT OF THE TECHNICAL DIRECTOR

[Reprint of Report, pages 1 to 35, inclusive]

REPORT OF THE TECHNICAL DIRECTOR

To the PUBLIC PRINTER:

I have the honor to submit the following report concerning the work of the division of tests and technical control of the Government Printing Office for the fiscal year ended June 30, 1927:

The total number of samples analyzed during the fiscal year 1927 was 7,336, compared with 6,844 for the preceding year, an increase of 492 samples, or 7 per cent. This includes all samples tested in connection with the technical inspection of delivered material, the testing of samples offered by bidders, the analysis of technical control samples of type metals, inks, glues, etc., and samples tested in connection with investigational problems.

INCREASE IN NUMBER OF SAMPLES TESTED

The rapid growth of the work and the importance of the division of tests and technical control are best shown by the accompanying tabulation, listing the number of samples of various materials analyzed in each fiscal year since its establishment in February, 1922.

Tabulation of samples tested by the division of tests and technical control

	1922 (5 months)	1922-23	1923-24	1924-25	1925-26	1926-27
Paper and paper products, including bid, delivery, and investigational samples.....	1, 258	3, 731	4, 045	3, 942	4, 397	4, 768
Textiles, including bookbinding cloths, and cordage..	103	543	466	516	589	692
Bookbinding leathers.....	16	26	60	35	50	142
Metals, including type metals, babbitt metals, tin, antimony, and lead.....	16	44	15	165	1, 066	899
Glue.....	8	(1)	(1)	44	43	37
Ink-making materials.....	15	194	234	266	231	323
Lubricating oils and greases.....	27	65	62	82	54	39
Gasoline.....	9	52	63	72	97	123
Chemicals.....	(1)	(1)	(1)	136	134	115
Miscellaneous, including soaps, waxes, turpentine, etc.	51	176	164	76	183	198
Total.....	1, 503	4, 831	5, 109	5, 354	6, 844	7, 336

1 Included under "Miscellaneous."

The foregoing tabulation shows that the samples of paper tested have increased considerably each year since the division of tests and technical control was established and also shows the largest increase of the various materials tested over last year. This has been due to the fact that the amount of paper purchased by the Government Printing Office has increased annually and also on account of the extended investigations of paper for the purpose of improving the present specifications and methods of testing.

Due to the supplying of blank paper to various Government departments and establishments, the quantity of paper purchased by the Government Printing Office has increased considerably the last three years. Over 4,800,000 more pounds of paper were purchased in the fiscal year 1927 than in the previous year.

The number of samples of paper tested includes all materials made of paper, such as envelopes, file jackets, fiber shipping containers, binder's board, and paper for special uses. A large number of samples have been tested in connection with the cooperative work being conducted on the standardization of paper.

Special attention has been given the past year to bookbinding leathers, bookbinding cloths, and ink-making materials. Most of this work has been of an investigational nature for the purpose of determining the essential requirements for these materials and to develop standard specifications for the qualities used by the Government Printing Office.

As a result of the careful technical inspection maintained over all materials delivered to the office, there has been a marked improvement in the quality of the various supplies received. In many cases rejections are due to unfamiliarity with the requirements of the Government specifications. The technical inspection of materials has been gradually broadened since the establishment of the laboratory and now includes all materials purchased or produced by the Government Printing Office.

The value and importance of the routine technical testing of all supplies can not be judged merely by the number of deliveries rejected but should be based on the total value represented by the materials purchased. During the past year supplies to the value of \$4,000,000 were purchased. For paper alone a total of \$2,900,000 was expended.

REJECTIONS OF PAPER AND OTHER MATERIALS

As a result of the technical inspection and testing of all deliveries of materials purchased, 301 deliveries were rejected, of which 206 were paper, 31 envelopes, and 64 miscellaneous materials.

The following is a tabulation of the rejections of paper, some deliveries being rejected for more than one deficiency:

Not within weight tolerance-----	39
General appearance-----	19
Unsatisfactory finish-----	1
Unsatisfactory opacity-----	2
Unsatisfactory in color-----	6
Deficient in stock-----	21
Deficient in folding endurance-----	68
Deficient in bursting strength-----	80
Excessive ash-----	2
Deficient in absorption-----	1
Deficient in thickness-----	6

There is also submitted a detailed tabulation of the inspection and testing of all deliveries of paper received during the year July 1, 1926, through June 30, 1927, giving the total number of pounds delivered, the total number of pounds rejected, the number of deliveries of each kind of paper received, and the number of deliveries rejected. In certain instances portions of deliveries were rejected and the remainder accepted, due to variation in the quality of paper in a single delivery. In such cases the rejection is listed as a delivery. The table follows:

Amount of paper received and results of technical inspection

Kind of paper	Amount delivered	Amount accepted	Amount rejected	Number of deliveries tested	Number of deliveries rejected
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>		
Newsprint.....	1,480,340	1,397,968	82,372	39	3
Machine-finish book.....	10,372,514	9,607,221	765,293	416	32
Supercalendered and halftone book.....	3,947,005	3,922,382	24,623	175	2
Coated book.....	720,981	716,723	4,258	33	2
Mimeograph paper.....	1,915,197	1,766,323	148,874	85	13
United States money-order safety and writing.....	612,859	612,859	-----	28	0
Map paper.....	224,614	146,093	78,521	34	16
Chart paper.....	218,910	218,910	-----	32	0
Manifold.....	573,100	564,190	8,810	66	4
Sulphite writing.....	2,099,432	1,756,016	343,416	114	15
Bond.....	4,582,184	4,032,440	549,744	369	54
Ledger.....	703,352	663,136	40,216	116	8
Index.....	216,501	209,313	7,188	37	4
Tissue.....	11,236	11,236	-----	10	0
Cover paper.....	384,297	362,136	18,161	52	3
Wrapping paper.....	1,533,975	1,259,980	273,995	100	20
Tag board.....	583,030	576,443	6,582	43	2
Manila cardboard.....	37,675	31,257	6,418	6	1
Railroad board.....	91,841	87,877	3,964	17	1
Wood bristol.....	627,994	504,394	123,600	34	9
United States postal-card bristol.....	11,751,348	11,613,593	137,755	318	13
Miscellaneous—paraffin, gummed, stereotype molding, oiled manila tympan, plate wiping, back lining.....	36,845	33,212	3,633	23	3
Blotting.....	139,317	130,839	8,478	15	1
News board, chip board, and box board.....	699,060	699,060	-----	27	0
Pressboard.....	21,592	21,592	-----	8	0
Binder's board.....	861,620	861,620	-----	23	0
Total.....	44,447,739	41,811,948	2,635,791	2,220	206

Frequently paper complying with the specifications in quality is rejected for noncompliance with the weight tolerance of 5 per cent above or below the ordered weight. There were 29 such rejections included in those listed for the year. On a total purchase for the year of 44,447,739 pounds of paper, the total quantity rejected amounted to 2,635,791 pounds, or approximately 5.5 per cent. Considering the total amount of paper purchased and the fact that a considerable quantity of paper rejected was for noncompliance with weight only, the total quantity rejected for noncompliance with the standard specifications is considered low.

During the year 568 deliveries of envelopes were received, covering a total of 41,112,962 envelopes of paper qualities varying from wood manila to the highest grades of bonds and ledgers. Thirty-nine deliveries, totaling 5,264,719 envelopes, were rejected during the year for noncompliance with specifications.

The following tabulation gives the total of each kind of envelopes purchased during the year:

Kind	Number of envelopes	Number of deliveries
Wood manila envelopes.....	1,459,721	21
Kraft envelopes.....	33,535,855	439
Rope manila envelopes.....	306,364	17
Sulphite manila envelopes.....	76,525	4
White writing envelopes.....	4,888,840	43
Fine white writing envelopes.....	89,900	10
Ledger envelopes.....	127,400	10
Fine white bond envelopes.....	624,072	20
Cloth-lined envelopes.....	4,275	4
Total.....	41,112,962	568
Total rejected.....	5,264,719	31

COOPERATION WITH CONTRACTORS

In order that reliable information may be obtained by contractors and prospective bidders on materials used by the Government Printing Office, especially paper, the division of tests and technical control has offered to test preliminary samples before shipment or any other samples which may be submitted to determine whether such material would comply with Government specifications. Copies of the test results are furnished the manufacturers submitting these samples for their own information and guidance. This policy of cooperation with Government contractors and bidders has proved to be of mutual advantage and has brought about a better understanding between the Government and the manufacturers furnishing paper and other materials to the Government Printing Office. During the present year approximately 550 samples of materials were tested in this connection. Of this number 445 were samples of paper.

In addition to the technical inspection of all materials purchased and the technical control work in connection with the materials manufactured by the Government Printing Office, the division of tests and technical control is engaged in investigational problems that are of the utmost importance to the office. The results of these investigations have been reported during past years and have shown the importance and value of this work, not only to the Government Printing Office but to the printing industry in general.

PAPER INVESTIGATIONS

INVESTIGATION OF BOND AND LEDGER PAPERS

The final report on the cooperative work conducted with the United Typothetæ of America and the paper manufacturers for jointly working out a technical standardization of bond and ledger papers has recently been published, including the proposed specifications for these papers. This report combines the two reports already published and includes a necessary revision of the tentative specifications for bond and ledger papers issued in 1924. Considerable interest in this work has been shown by the paper manufacturers, and especially by the large consumers of paper. Copies of this report are available to anyone interested in this work and will be furnished upon request.

A number of mills have sent in additional samples of their papers to be tested in connection with this investigation, and other mills which had not previously cooperated have furnished complete sets of their mill brands of bond and ledger papers. Forty-three paper mills have cooperated in this investigation by submitting samples of their regular mill brands of bond and ledger papers. For both the first and second investigations, a total of 230 samples of bond and 112 samples of ledger papers were tested. These results represent the most comprehensive survey of technical tests ever issued for these kinds of papers.

The present Government specifications for bond and ledger papers were adopted as a result of this extended investigation. These specifications, which have been used by the Government for over three years, have proved very satisfactory in use and are a decided improvement over the specifications formerly used for purchasing these grades of paper.

The folding endurance test has proved to be the only available physical test for furnishing reliable information as to the quality of the various grades of bond and ledger papers. The bursting-strength test has been found inadequate for measuring the quality of these papers. The specifications for bond and ledger papers are in harmony with good commercial practice, and no difficulty is experienced in securing competitive bids on the Government's requirements for these papers.

INVESTIGATION OF KRAFT PAPER

The results of the extended investigation on kraft paper which has been conducted are now being tabulated for publication, and every effort will be made to issue them at an early date. The Government specifications for kraft paper, which were adopted in 1925 as a result of the investigation, have proved to be a decided improvement over the specifications formerly used for the purchase of this grade of paper.

The folding-endurance test has proved more satisfactory than the bursting-strength test, which was the only physical test formerly used for measuring the quality of kraft paper. The "pop" test could be met by the addition of sizing or by other means which added nothing to the serviceability of the paper.

ASSISTANCE TO PAPER SPECIFICATIONS COMMITTEE

During the last five years many changes have been made in the paper specifications of the Government Printing Office to materially improve and make them in harmony with good commercial practice. Every change made in the paper specifications has been proposed as a result of investigations conducted by the division of tests and technical control or the experiences of this division in testing paper delivered to the office. Comparison of the quality of paper previously purchased with that received during the last few years clearly shows the strides which have been made in the development of suitable specifications for the purchase of paper of proper quality for the various Government requirements. Further investigations are under way relative to paper testing and the specifications for other grades of paper.

INVESTIGATION OF PRINTING PAPERS

An extensive investigation on book papers is now being carried out in cooperation with the paper manufacturers. This investigation will include machine-finish, supercalendered, and coated book papers of all qualities. Fifty-eight paper manufacturers have been requested to furnish samples of their regular mill brands of papers for this investigation. These samples will be subjected to all available tests for measuring the various qualities and the most satisfactory tests for indicating quality will be determined. The results of this investigation will be used in a revision of Government specifications for these grades of paper and will be of value in developing a commercial standardization based on technical tests. Special attention will be given to a study of the relationship of printing inks to papers and the development of methods for measuring these qualities by laboratory tests.

INVESTIGATION OF NEWSPRINT PAPER

A similar investigation relative to newsprint paper is also under way in cooperation with the mechanical department of the American Newspaper Publishers' Association. The newsprint investigation will prove of value to both the manufacturers and consumers of this paper.

STUDY OF ATMOSPHERIC CONDITIONS

The investigations relative to atmospheric conditions and moisture content of various kinds of paper have been continued. The installation of humidifying equipment in the Government Printing Office has been extended. The maintenance of uniform atmospheric conditions and the elimination of low relative humidity have proved a decided advantage in securing maximum production and in eliminating pressroom difficulties attributable to atmospheric conditions.

The data being collected relative to the moisture content of various kinds of paper are proving to be of great importance. The addition of a moisture requirement in the specifications for postal-card paper has proved the importance of maintaining the moisture content of certain papers within specified limits. The results of this work will prove of importance in connection with the use of paper on present-day printing equipment and in overcoming static electricity, curl, wavy edges, wrinkles in roll stock, and other difficulties experienced with paper, due primarily to moisture content.

INDOOR ATMOSPHERIC CONDITIONS IN EUROPE

The subject of atmospheric conditions was studied by the technical director when in Europe in 1926, and it was noted that there was considerable difference between atmospheric conditions in Europe and those which exist in the more populous portions of the United States. These conditions were studied in England, Germany, and France. No difficulty appeared to be experienced in those countries with low relative humidity or static electricity, the source of most troubles in printing plants in the United States. This was found to be due to the higher relative humidity conditions existing indoors and outdoors in Europe throughout the year.

A study of the moisture content of paper in Europe and the atmospheric conditions under which paper is handled indicate that the difficulties experienced there were due chiefly to high relative humidity conditions. The adoption of a relative humidity of 65 per cent and a temperature of 65° F. for standard paper-testing conditions in European countries is fully justified in view of the normal indoor conditions existing in these countries. However, this does not justify the adoption of a similar standard in this country. The standard atmospheric testing condition for paper of 70° to 75° F. temperature and 50 per cent relative humidity adopted by the United States Government has proved quite satisfactory and furnishes test results which are in harmony with the actual conditions under which paper is handled in the United States.

The following tabulation gives the indoor temperature and relative humidity in London for each month for the years 1925 and 1926. This datum was kindly furnished by Mr. Edw. A. Dawe, examiner of the receiving and examining branch of His Majesty's stationery office, Stamford Street, London, S. E. 1. The results were recorded in the testing laboratory of the British stationery office, where all paper

and other materials purchased are inspected and tested. These results were obtained from readings taken three times a day, 10 a. m., 1 p. m., and 4 p. m. It will be noted that the indoor temperatures are lower than usually exist indoors in this country, due to custom and climatic conditions.

Temperature and relative humidity in London, 1925 and 1926

[His Majesty's stationery office, Cornwall House, Stamford Street, London, SE. 1. Receiving and examining branch. Edw. A. Dawe, examiner]

Month	Average temperature	Relative humidity			Month	Average temperature	Relative humidity		
		Average	Maximum	Minimum			Average	Maximum	Minimum
1925	° F.	Per ct.	Per ct.	Per ct.	1926	° F.	Per ct.	Per ct.	Per ct.
January.....	62.8	62.9	75.0	51.0	January.....	61.4	56.3	68.0	51.0
February.....	63.8	59.9	68.0	51.0	February.....	63.4	60.5	77.0	52.5
March.....	65.6	51.5	59.0	47.5	March.....	62.9	53.5	60.0	46.0
April.....	64.7	48.0	53.0	40.0	April.....	64.9	56.9	63.0	49.0
May.....	66.8	58.9	72.0	51.0	May.....	59.4	66.5	77.0	55.0
June.....	69.0	54.1	73.0	33.0	June.....	67.6	66.5	78.0	48.0
July.....	71.2	60.7	75.5	40.0	July.....	70.0	67.4	78.0	46.5
August.....	61.4	71.0	82.0	56.0	August.....	70.1	65.0	76.5	50.0
September.....	61.5	70.1	88.0	50.0	September.....	65.3	71.9	87.0	55.0
October.....	61.5	69.2	81.0	53.5	October.....	59.9	61.1	72.5	52.0
November.....	59.2	58.7	70.0	50.0	November.....	59.9	61.1	70.0	55.0
December.....	60.9	53.0	62.0	46.0	December.....	57.9	58.6	69.0	52.0
Average for year...	64.0	59.8	-----	-----	Average for year...	63.6	62.3	-----	-----

For comparative purposes the tabulations published in last year's report giving the indoor and outdoor temperature and relative humidity in Washington for each month for the same period of time are also given.

Month	Indoor				Outdoor	
	Temperature, average	Relative humidity			Temperature, average	Relative humidity, average
		Average	Maximum	Minimum		
1925	° F.	Per cent	Per cent	Per cent	° F.	Per cent
January.....	80.9	23	35	16	32.3	67.3
February.....	81.3	29.2	41	18	42.7	64
March.....	79.6	30.6	46	20	46.7	61.3
April.....	78.3	34.4	49	20	54.3	56.6
May.....	80.6	34.6	51	23	62.7	57
June.....	84.3	34.9	48	21	79	59
July.....	82.7	39.3	55	25	77.7	64.7
August.....	81.6	55.6	66	41	71	68
September.....	80.7	60.5	79	45	72.7	68.7
October.....	79.3	43.9	63	26	53	68.3
November.....	80.1	22.3	31	12	44.7	63
December.....	78.9	28.2	37	18	37	61
Average for year.....	80.7	36.4	-----	-----	56.1	63.2
1926						
January.....	78.5	31.4	41	21	33.7	64.7
February.....	78.8	21.8	39	15	36.3	66.7
March.....	80.4	23	33	12	39.7	54
April.....	81.2	31.4	42	20	52	48.7
May.....	79.5	39.8	49	25	65.3	50.4
June.....	80.6	46.8	68	29	70.4	61
July.....	84.3	55.1	72	45	77.7	66.7
August.....	79.1	57.9	75	36	76	75.3
September.....	78.1	65.8	79	56	68.7	77
October.....	78.7	55.7	75	33	57.7	73.3
November.....	80	39.2	54	25	44.7	66.7
December.....	79.4	21.2	32	13	33.7	69.7
Average for year.....	79.8	40.7	-----	-----	54.7	64.5

INVESTIGATIONS RELATIVE TO DURABILITY OF PAPER

Considerable investigational work is being conducted by the division of tests and technical control relative to the durability and permanency of paper. One of the most important considerations in the purchase of paper for the use of the Government is the development of specifications which will insure the highest quality of durable paper for the records of the Government. It is of prime importance that in the production of many Government documents the most durable paper obtainable shall be used. The Government Printing Office offers probably the best field available in this country for the study of the permanency of paper. In addition to producing important record books and Government documents, the office employs many experienced bookbinders who devote their entire time to the preservation of valuable Government records. This offers an exceptional opportunity for the examination of the paper used in old records and for a study of the causes of deterioration of paper. The data obtained will prove of value in the development of specifications for durable paper.

The specifications for 100 per cent rag ledger paper were modified last year in order to obtain paper of the most durable quality. The specifications now require the use of new white or cream rags only and prohibit the presence of any sizing materials or chemicals which might limit the permanency of the paper. These requirements, together with the folding-endurance tests previously added to the specifications, should insure the highest quality of this grade of paper.

In cooperation with the New York Times and the paper manufacturers, investigational work is being conducted relative to the production of an all-rag newsprint paper for the printing of permanent library editions of newspapers and periodicals. The work which has been done on this problem has proved to be of considerable interest and value also to the research work of the Government Printing Office.

An investigation has also been made relative to methods for measuring the absorption of blotting paper. Three different methods proposed for this purpose were used, including the 1-cubic-centimeter standard-ink method, the Klemm or mounting test, and the Dahlen absorption test. As a result of this investigation it was found that the results with the 1-cubic-centimeter standard-ink method, which method has been in use in the Government specifications during the last four years, gave satisfactory results in harmony with actual service. Further work is now under way in order that a complete report may be issued.

RELATIONSHIP OF PAPER TO PRINTING INKS

Considerable investigational work has been conducted by the chemists of the laboratory on the relationship of paper to printing inks. This investigation has dealt with methods for measuring the opacity of paper and the resistance of paper to printing inks. Owing to the increased use of lightweight printing papers to-day, considerable interest has developed in this work. The resistance of paper to printing ink is just as important as the opacity of the paper in studying difficulties experienced with the showing through of

the printing. The work so far conducted has dealt especially with mimeograph, newsprint, and book papers.

The preliminary investigation has shown that tests for measuring the degree of sizing of paper will not furnish information as to the relationship of paper to oil-base inks, such as mimeograph and printing inks. Two methods have been developed and are now being used for testing printing papers. This work is being conducted in cooperation with the paper-testing committee of the Technical Association of the Pulp and Paper Industry and will be of considerable interest to the paper and printing industries.

At the request of the District of Columbia government, specifications have been prepared for the purchase of paper for the use of the Washington schools. All bid and delivery samples submitted under these specifications have also been tested for compliance with the same.

At the request of the superintendent of the reading room of the Library of Congress, investigational work is being conducted relative to the development of specifications for jacket envelopes for filing pamphlets on the shelves of the library. As a result of this work, specifications will be recommended for the most serviceable and economical quality of paper for use in these jackets.

Assistance has also been rendered the American Red Cross relative to tests on samples of coated and supercalendered book papers for use in their publications. Considerable difficulty had been experienced with the breaking at the fold of the paper in these publications. Over 30 samples of paper were tested for the Red Cross and it was found that the folding-endurance test furnished the most reliable information as to serviceability of papers for its use.

TECHNICAL CONTROL OF TYPE-METAL ALLOYS

Owing to the importance of the technical control work on type-metal alloys in the Government Printing Office, a complete summary of the work since it was started is given in this report. This work was first undertaken during the year 1925 and has proved to be one of the most important investigations undertaken by the division of tests and technical control.

The maintenance of standard qualities of linotype, monotype, stereotype, and electrotype-backing metals is essential in order to obtain maximum production of good printing. The value of the technical control of type-metal alloys is reflected not only in the printing division, where the use of uniform standard-quality metal results in the maximum production of good composition with a minimum of defective type, but also in the plate-making division, where stereotype and electrotype plates are produced from the type, and in the press division, where longer runs of better-quality printing will result. The maintenance of a uniform standard of stereotype metal also results in plates which give a maximum production of good printing.

As a result of the technical control work, every pound of linotype, monotype, or stereotype metal used by the Government Printing Office to-day is of a standard composition for each kind of metal.

Between 20,000 and 30,000 pounds of type metal in lots of approximately 10,000 pounds each are analyzed and corrected daily to the

standard formulæ for linotype, monotype, and stereotype metals, respectively.

The following tabulation gives the amount of each kind of metal corrected to standard formulæ between July 1, 1926, and June 30, 1927, together with the amounts of new metals or alloys used in making such correction.

An accurate record of the dross from each of the various type metals was not kept for the entire year. The total amount of dross from linotype, monotype, and stereotype metals approximately 90,000 pounds for the year, which accounts for a type-metal loss of approximately 81,000 pounds. This should be taken into consideration in noting the increase in the various metals due to technical control.

LINOTYPE METAL

	Pounds
Old metal melted.....	4, 842, 425
Lead used in correction.....	129, 300
Lead-antimony alloy ¹ used in correction.....	30, 340
Total corrected metal.....	5, 002, 065
Increase due to correction.....	159, 640
Percentage increase due to correction.....	3. 3

MONOTYPE METAL

Old metal melted.....	1, 615, 750
Lead-antimony alloy ¹ used in correction.....	20, 842
Tin used in correction.....	2, 165
Tin-antimony alloy ² used in correction.....	9, 570
Total corrected metal.....	1, 648, 327
Increase due to correction.....	32, 577
Percentage increase due to correction.....	2. 0

STEREOTYPE METAL

Old metal melted.....	426, 100
Lead-antimony alloy ¹ used in correction.....	3, 390
Lead used in correction.....	400
Tin used in correction.....	510
Tin-antimony alloy ² used in correction.....	200
Total corrected metal.....	430, 600
Increase due to correction.....	4, 500
Percentage increase due to correction.....	1. 0

Due to the condition of the various type metals in the Government Printing Office previous to technical control, the quantity of the respective metals has been constantly increased by the addition of the necessary alloys to bring the old metal up to the standard quality adopted for each metal. In order that the full significance of this work may be shown, there is tabulated herewith each month's results of the technical control of type metal since this work was started in 1925 for linotype, monotype, and stereotype metals. In each of these tabulations are given the amount of old metal melted, the amount of new alloys required to bring the metal up to the respective standard formula, the total amount of corrected metal, and the percentage increase due to the addition of necessary correction alloys.

¹ Lead-antimony alloy consists of approximately 55 per cent lead and 45 per cent antimony.

² Tin-antimony alloy consists of 33 per cent tin and 67 per cent antimony.

LINOTYPE METAL

[Standard formula: Tin, 4 to 4.5 per cent; antimony, 11.5 per cent; lead, 84.5 to 84 per cent]

Period	Old metal melted	Correction metals used		Total corrected metal	Increase due to correction
		Lead-antimony alloy ¹	Lead		
1925	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Per cent</i>
October.....	10,550	765	3,185	14,500	37.4
November.....	82,650	6,935	27,170	116,755	41.2
December.....	172,650	9,400	34,500	216,550	25.4
1926					
January.....	468,575	14,045	64,160	546,780	16.7
February.....	396,950	8,465	34,160	439,575	10.7
March.....	542,950	5,975	26,075	575,000	5.9
April.....	472,900	5,530	29,470	507,900	7.4
May.....	374,100	5,325	20,225	399,650	6.8
June.....	484,450	5,365	21,510	511,305	5.5
July.....	435,550	5,365	20,155	461,520	5.8
August.....	488,000	5,110	18,600	511,710	4.8
September.....	472,300	3,580	15,370	491,250	4.0
October.....	333,600	1,840	6,310	341,250	2.3
November.....	347,500	265	10,415	358,170	3.1
December.....	228,250	540	2,210	231,000	1.2
1927					
January.....	391,100	810	4,340	396,250	1.3
February.....	379,600	1,190	5,210	386,000	1.7
Do.....	32,700	960	3,640	37,300	² 14.0
March.....	122,200	3,460	12,240	137,900	² 12.8
Do.....	298,750	1,250	4,150	304,150	1.8
April.....	440,500	2,575	7,275	450,300	2.0
May.....	470,725	2,900	14,070	488,845	3.6
June.....	401,650	995	5,315	407,960	1.6
Total.....	7,945,640	-----	-----	8,429,010	-----

¹ Lead-antimony alloy consists of approximately 55 per cent lead and 45 per cent antimony.² These special lots of linotype metal were corrected to 4 per cent tin to determine the relative merits of 4 and 4.5 per cent metal for use on the linotype machine.

MONOTYPE METAL

[Standard formula: Tin, 7 per cent; antimony, 16.5 per cent; lead, 76.5 per cent]

Period	Old metal melted	Correction metal used			Total corrected metal	Increase due to correction
		Lead-antimony alloy ¹	Tin	Tin-antimony alloy ²		
1925	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Per cent</i>
April, May, June.....	171,820	11,270	310	-----	183,400	6.75
July.....	93,300	5,035	75	-----	98,410	5.5
August.....	99,180	4,555	-----	-----	103,735	4.6
September.....	162,520	5,740	-----	-----	168,260	3.5
October.....	164,940	3,570	-----	-----	167,810	2.2
November.....	150,645	5,715	-----	-----	156,360	3.8
December.....	135,960	5,375	-----	-----	141,335	3.9
1926						
January.....	118,900	4,630	208	-----	123,728	4.0
February.....	137,100	5,720	44	-----	142,864	4.2
March.....	200,100	5,370	370	-----	205,840	2.9
April.....	157,500	5,325	337	-----	163,162	3.5
May.....	143,750	3,730	465	-----	147,945	2.9
June.....	164,835	3,455	330	-----	168,620	2.3
July.....	162,800	4,870	40	-----	167,710	3.0
August.....	152,550	3,170	535	-----	156,255	2.4
September.....	163,250	3,070	260	-----	166,580	2.0
October.....	102,550	2,817	370	-----	105,737	2.9
November.....	131,300	3,295	415	-----	135,010	2.8
December.....	66,450	1,315	200	-----	67,965	2.8
1927						
January.....	88,500	1,880	270	-----	90,650	2.4
Do.....	97,950	-----	-----	1,690	99,640	1.7
February.....	141,750	-----	-----	2,380	144,130	1.7
March.....	146,250	-----	-----	2,115	148,365	1.4
Do.....	9,500	425	-----	-----	9,925	4.5
April.....	128,500	-----	-----	1,350	129,850	1.05
May.....	121,250	-----	75	545	121,870	.5
June.....	103,150	-----	-----	1,490	104,640	1.4
Total.....	3,545,460	-----	-----	-----	3,661,766	-----

¹ Lead-antimony alloy consists of approximately 55 per cent lead and 45 per cent antimony.² Tin-antimony alloy consists of 33 per cent tin and 67 per cent antimony.

STEREOTYPE METAL ⁴

[Tentative standard formula, adopted October, 1925: Tin, 8 per cent; antimony, 15.5 per cent; lead, 76.5 per cent]

Period	Old metal melted	Correction metals				Total corrected metal	Increase due to correction
		Lead-antimony alloy ¹	Lead	Tin	Tin-antimony alloy ³		
1925	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Per cent</i>
June.....	10, 100	1, 695	750	-----	-----	12, 545	24. 2
July.....	10, 490	1, 135	1, 445	12	-----	13, 082	24. 6
August.....	17, 560	1, 774	1, 840	-----	-----	21, 174	20. 6
September ⁵	26, 780	2, 378	2, 835	-----	-----	31, 993	19. 5
October.....	58, 770	543	2, 724	-----	-----	62, 040	5. 5
November.....	-----	(⁶)	(⁶)	(⁶)	(⁶)	-----	-----
December.....	-----	(⁶)	(⁶)	(⁶)	(⁶)	-----	-----
1926							
January.....	54, 530	512	664	261	-----	55, 967	2. 6
February.....	49, 400	970	500	-----	-----	50, 870	3. 0
March.....	58, 650	840	760	35	-----	60, 285	2. 8
April.....	71, 050	1, 225	2, 245	40	-----	74, 560	4. 9
May.....	58, 850	320	680	90	-----	59, 940	1. 8
June.....	68, 300	655	-----	45	-----	69, 000	1. 0
July.....	60, 000	640	-----	-----	-----	60, 640	1. 1
August.....	41, 000	660	-----	220	-----	41, 880	2. 1
September.....	30, 900	450	-----	-----	-----	31, 350	1. 5
October.....	41, 050	490	-----	-----	-----	41, 540	1. 2
November.....	20, 200	-----	-----	-----	-----	20, 200	0
December.....	21, 100	300	-----	-----	-----	21, 400	2. 0
1927							
January.....	51, 750	300	-----	90	-----	52, 050	. 6
February.....	40, 850	350	-----	-----	-----	41, 290	1. 1
March.....	60, 000	100	-----	-----	-----	60, 100	. 2
April.....	20, 200	100	-----	-----	-----	20, 300	. 4
May.....	19, 000	-----	400	110	-----	19, 510	2. 7
June.....	20, 050	-----	-----	90	200	20, 340	1. 4
Total.....	910, 570	-----	-----	-----	-----	942, 053	-----

¹ Lead-antimony alloy consists of approximately 55 per cent lead and 45 per cent antimony.

³ Tin-antimony alloy consists of 33 per cent tin and 67 per cent antimony.

⁴ Owing to the wide variation in the quality of the old stereotype plates in the Government Printing Office, it has been necessary, in order to standardize this metal, to remelt the old plates in 10,000-pound lots, correct each lot to the tentative standard formula adopted, and then pour the metal in 25-pound pigs for use in the stereotype pot. It would have been impossible to correct this metal in the stereotype-casting pot as used.

⁵ During the first four months the metal was corrected to the following tentative formula: Tin, 7 per cent; antimony, 16.5 per cent; and lead, 76.5 per cent.

⁶ No corrections.

It will be noted that a considerable economy and reduction in the amount of necessary correction alloys added have been effected during the last year by the use of a correction alloy of 33 per cent tin and 67 per cent antimony for standardizing monotype and stereotype metals. The use of this alloy is especially efficient with monotype metal, which the work has shown requires a consistent correction after each casting of approximately 0.3 to 0.4 per cent tin and 0.6 to 0.8 per cent antimony, due to dross losses on the casting machines and in the remelting process.

It will also be noted from this tabulation that the quantity of correction metal required, or the increase in amount of type metal due to correction of the old metal, was much greater when the technical control of type metal was first begun than during the last year. This is due to the fact that the condition of the metal has materially improved under technical control and that most of the metal has been through the standardization process at least once.

The correction of type metal has now reached the point where the increase due to correction is practically offset by the normal losses due to drossing. The technical control of the metals will therefore cause practically no further increase in the metal stock of the Government Printing Office, but will maintain the standard qualities and quantities of the various type alloys.

INCREASE IN TYPE METALS DUE TO STANDARDIZATION

The technical control work has added a needed supply of 631,159 pounds of type-metal alloys to the stock of the Government Printing Office. It should always be kept in mind in noting the increases due to correction, that there is a continual loss in type metals due to drossing, amounting to between 1 and 3 per cent. The increase in each kind of metal since technical control was started to June 30, 1927, is given below:

	Pounds
Linotype increase.....	483, 370
Monotype increase.....	116, 306
Stereotype increase.....	31, 483
Total.....	631, 159

BENEFITS OF TECHNICAL CONTROL OF TYPE ALLOYS

A saving of approximately \$20,000 has been effected in producing the increased quantity of type metals if compared with the market values of alloys of the same compositions during the time this work was done. In addition, a decided improvement has been effected in the quality of all type metals, which has been reflected throughout the work of the Government Printing Office. This has resulted in another appreciable economy which is difficult to estimate in figures.

A complete standardization of the approximately 4,500,000 pounds of linotype, monotype, and stereotype metal in the Government Printing Office would have cost about \$360,000, if handled by commercial concerns. The condition of most of the metal was such that it would have required replacement with new alloys of standard qualities adopted in exchange for all old metal, and this estimate is based on the cost of such a transaction. This does not include the cost of handling and the inconvenience which would have resulted from such an exchange. This is therefore a conservative estimate of the actual savings effected as a result of this technical control of type metals.

INVESTIGATIONS RELATIVE TO TYPE-METAL DROSS

The composition of type-metal alloys changes after continued use in casting, melting, and recasting, due to loss of certain metals by oxidation or drossing and by contamination with other metals. There is a continual loss in the amount of type metal due to drossing.

An investigation is now under way to determine the normal losses by drossing of the respective type metals, the composition of various type-metal drosses, and the best method to reduce dross losses to a minimum. It is hoped by this investigation to reduce materially the amount of dross during the next year. The investigation should be of interest to commercial printers, as there appears to be no reliable data available on this subject at present.

Type-metal dross is composed mainly of the oxides of tin, antimony, and lead, together with any impurities removed in the process of drossing, and more or less dirt from sweepings around the machines and metal pots. The amount and composition of the dross from each kind of metal varies somewhat from day to day. About 80 to 85 per cent of the weight of dross can be recovered as metal by reduction processes. The actual loss of type metal due to drossing is probably about 90 per cent of the weight of the dross.

It is the present practice of the Government Printing Office to exchange all dross for correction alloys which are used in bringing type metals up to the standard formulæ. During the fiscal year 133,058 pounds of linotype, monotype, and stereotype dross, which includes a considerable amount accumulated from the previous year, was exchanged for 22,931 pounds of correction alloy consisting of 33 per cent tin and 67 per cent antimony, and 10,000 pounds of linotype metal of the composition of 4 per cent tin, 11.5 per cent antimony, and 84.5 per cent lead.

The following tabulation gives complete data for the latter portion of the fiscal year 1927 relative to the amount of dross from each kind of metal, the loss or gain in the amount of each type metal due to the correction metal added, and the dross loss:

Dross losses and correction increase data on type metal

Kind of metal	Old metal melted	Increase due to correction metals added	Increase due to correction	Weight of dross	Dross calculated on old metal	Metal lost by drossing ¹	Per centage of metal lost by drossing	Per centage of gain or loss
	<i>Pounds</i>	<i>Pounds</i>	<i>Per cent</i>	<i>Pounds</i>	<i>Per cent</i>	<i>Pounds</i>		
Linotype.....	1,991,225	44,930	2.25	16,473	0.83	14,826	0.75	+1.50
Monotype.....	670,400	7,380	1.1	16,503	2.46	14,853	2.22	-1.12
Stereotype.....	139,900	1,470	1.05	945	.68	851	.61	+ .44

¹ Calculated from the amount of dross, allowing a 90 per cent metal value.

NOTE.—Linotype and monotype metal data cover the last 5 months of fiscal year (February through June). Stereotype-metal data cover only the last 4 months.

Definite conclusions can not be drawn from this tabulation as to the normal loss or gain of these metals in the Government Printing Office owing to the fact that even to-day metal will be received in the metal room for remelting that has not previously been standardized by technical control and will therefore require the addition of correction metals or alloys in excess of the amount lost by drossing. As previously noted in the tabulation on the correction of stereotype metal, the data on this metal are given on the remelting of stereotype plates in the metal room and pigging the corrected metal for use in the stereotype pot. It does not include the loss by drossing in the stereotype-casting room.

The standard formulæ which were tentatively adopted last year for the respective metals have been adhered to throughout the year with but a slight modification of the monotype formula. Standard formulæ have been adopted for both linotype and monotype metal. Further investigations are being conducted relative to stereotype metal before a standard formula for this metal will be adopted.

MONOTYPE METAL

During the past year further investigations were conducted on different composition alloys for monotype metal. This work was conducted primarily to determine the most satisfactory quality metal to withstand the pressure required in wax molding. Further work will be done in testing out various composition alloys on the presses to determine their relative wearing resistance. Metal of the standard composition has given satisfactory results in presswork.

Analyses of test runs of monotype metal

Designation of metal	Tin	Anti- mony	Copper	Lead (by dif- ference)
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
1—standard.....	7.0	16.5	0.25	76.25
2.....	8.7	18.8	1.10	71.4
3.....	6.8	16.1	.30	76.8
4.....	9.3	18.1	.80	71.8
5a.....	8.4	19.3	.25	72.05
5b.....	8.4	19.3	.25	72.05
6.....	7.9	18.0	.50	73.60

All type was cast at 750° F., except 5b, which was cast at 800° F.

These six monotype-metal alloys were used on the same casting machine and the same two-column page of six-point type was set with each metal. A careful inspection was made as to the quality of the type cast with each alloy and the pages were then submitted to the plate-making division for severe molding tests. As a result of these tests it was found that no better results were obtained with any of the new compositions than with metal of the composition of the tentative standard of 7 per cent tin, 16.5 per cent antimony, and 76.5 per cent lead.

Investigation indicates that in casting there is a consistent loss of tin and antimony from the alloy. If the composition of the metal added to the melting pot on the casting machine is 7 per cent tin, 16.5 per cent antimony, and 76.5 per cent lead, analysis of the type cast will show a slight decrease in the percentage of tin and antimony. Data indicate that approximately two parts of the antimony are lost to one part of tin. This loss is due to the high melting point of an alloy of this composition, the temperature maintained on the casting machine being approximately 750° F., and also to the high antimony content of the alloy. In an alloy containing a high percentage of antimony, above the eutectic point for antimony and lead (13 per cent), a portion of the antimony is present as a mechanical mixture and is not chemically alloyed. The unalloyed metal will tend to rise to the surface of the molten metal and be skimmed off with the dross. At 750° F. temperature there will also be an appreciable loss by oxidation of the metal exposed to the air on the surface of the pot.

The standard composition adopted for monotype metal is 7 per cent tin, 16.5 per cent antimony, approximately 0.25 to 0.4 per cent copper, and the remainder lead. However, in order to insure that the type cast will not be below this composition, correction is made to 7.3 per cent tin and 16.8 per cent antimony. All monotype metal

has been corrected to this standard since February 1, 1927. For type cast for special use or for intricate type faces, where additional hardness is desired, a composition of 9 per cent tin, 19 per cent antimony, 0.4 to 1 per cent copper, and the remainder lead is used. The presence of a small quantity of copper in monotype metal does not interfere with its use on the casting machine and adds to the hardness and wearing quality of the type cast.

LINOTYPE METAL

The high tin content of the linotype metal in the Government Printing Office when technical control work was first started made it more economical to correct all linotype metal to 4.5 per cent tin rather than 4 per cent tin. Tests made at that time indicated that 4.5 per cent tin, 11.5 per cent antimony, and 84 per cent lead gave very satisfactory results on the linotype machines.

In order to determine definitely whether any better results could be obtained with metal of 4 per cent tin, 11.5 per cent antimony, and 84.5 per cent lead, 175,000 pounds of linotype metal were corrected to this formula during the year. This metal was used continuously on eight linotype machines for comparison with the results obtained on the other machines using metal of the tentative standard formula of 4.5 per cent tin, 11.5 per cent antimony, and 84 per cent lead. Inspection of the type slugs cast and the action of the metal on the machine showed no apparent difference in the quality of type slugs with either alloy. Therefore the Government Printing Office has adopted as its standard formula for linotype metal, 4 to 4.5 per cent tin, 11.5 per cent antimony, copper preferably below 0.05 per cent and not over 0.08 per cent, and the remainder lead.

METHODS OF TECHNICAL CONTROL OF TYPE ALLOYS

Important factors in the handling of type-metal alloys are the methods employed to properly purify the metals, the temperature at which the necessary metals or alloys are added to bring the metal to the proper composition, and the proper alloying and agitation of the corrected metal. Various composition fluxes have been used, and both hand and mechanical agitation employed, to accomplish the desired results. As a result of the investigations, the use of a block of green oak wood, immersed in the molten metal and held near the bottom of the pot, has been adopted for this purpose. This is a modification of the old-time methods of purifying type-metal alloys in which pine knots, green bones, or raw potatoes were used, and has proven very satisfactory and economical for agitating and purifying the metal. It is believed to be superior to mechanical or hand agitation. A block of green oak about 12 by 8 inches in size will create an active agitation of the 10,000 pounds of metal for two or three hours. The use of any flux has been abandoned, unless analysis shows the presence of an impurity which requires special attention.

As a result of the investigational work conducted on type-metal alloys and the experience of over two years in handling more than 13,000,000 pounds of linotype, monotype, and stereotype alloys, the following methods have been adopted for the remelting and correction of these metals in order to secure the best-quality metals:

1. All old metal after being melted must be carefully drossed and stirred in order to secure satisfactory samples for analysis. Samples

must be taken with a clean ladle by dipping down to the bottom of the pot and pouring the metal in a small mold holding about one-half pound. Information must also be furnished with each sample as to the total weight of molten metal in the pot.

2. The addition of correction metals or alloys to the molten type metal must be made only when the metal is at a temperature between 750° and 800° F. A tin-antimony alloy consisting of 33 per cent tin and 67 per cent antimony, and a lead-antimony alloy consisting of 60 per cent lead and 40 per cent antimony, grade A lead and grade A tin, are now used for standardizing type metal. Up to the present time all antimony added to type metal has been introduced after previously being alloyed with lead or tin.

3. For alloying, agitating, and purifying the metal, a block of green oak wood, immersed in the metal and held near the bottom of the pot by iron cages, is used. This is one of the most important operations in the handling of type-metal alloys. All metal must be agitated at least one hour before being poured. The procedure is to allow the oak block to remain in the pot until action ceases. In addition, the metal must be thoroughly stirred every hour during pouring.

4. Corrected alloys of linotype, monotype, and stereotype metal must be poured only in water-cooled molds, and linotype and stereotype pigs must be skimmed immediately after being poured. Air-cooled molds must not be used. Linotype and stereotype metals are poured at approximately 600° F. and monotype metal at between 700° and 750° F.

5. In order to remove small amounts of copper from linotype and stereotype metals the metal is allowed partially to solidify overnight after being corrected. Any copper or unalloyed antimony present will tend to separate from the alloy and come to the top as the metal chills. The metal is melted in the morning without agitation and the temperature raised to approximately 550° F. It is then carefully skimmed to remove the impurities which separated during the cooling process. The metal is then thoroughly stirred before being poured. This effects a gradual reduction of the copper content to approximately 0.07 per cent, which will not interfere with the use of the metal on linotype machines or in stereotype work. Sulphur can also be employed for this purpose and will further reduce the copper content.

The metal room is equipped with an indicating pyrometer by means of which the temperature of any of the pots can be determined at a glance, and also a recording pyrometer for use in recording the range of temperature in any pot for any period of time.

The quality of the metal has been improved to a marked degree since technical control has been in effect and no complaints relative to the quality of any type metal have been received during the year.

PROPOSED INVESTIGATIONS ON TYPE-METAL ALLOYS

The following investigations relative to type-metal alloys are now under way or planned for the next year:

1. To determine normal loss of each kind of metal due to drossing and to investigate methods to reduce dross losses to a minimum.

2. To determine the normal change in composition of the different type-metal alloys due to continued use and how often it is necessary to tone these alloys in order to maintain the quality and to ascertain the best composition alloys for different kinds of printing. This work

will be conducted in cooperation with the mechanical section of the American Newspaper Publishers Association.

3. To investigate, in cooperation with the General Electric Co., the use of electric heat for melting and correcting type-metal alloys.

4. To investigate the following points in connection with stereotype metals:

(a) The relative merits of virgin metal alloys and old alloys free from injurious impurities corrected to the proper composition.

(b) The maximum allowable copper content of stereotype metal in order to secure the best results.

(c) The effect of the rate of cooling on stereotype plates, with particular reference to clearness of face and durability on the press.

5. To investigate electrotpe backing-up metal in order to ascertain the best composition alloy for this purpose.

The Government Printing Office has approximately 1,800,000 pounds of electrotpe-backing metal, the composition of which has heretofore been adjusted without chemical analysis or control. It varies considerably in different lots. A tentative formula of 4 per cent tin, 3 per cent antimony, less than 0.1 per cent copper, and the remainder lead has been adopted for this alloy.

WORK OF THE INK SECTION

The work of the ink section was materially increased during the year, due chiefly to supplying various inks to departments and independent establishments of the Government in accordance with authorization by the Sixty-ninth Congress. The total production for the year was 147,589 pounds. This shows an increase of 25 per cent over last year, when 118,061 pounds of ink were produced. The following tabulation gives the ink production for each of the last five years, showing the percentage increase for each year over the previous year:

Fiscal year	Amount	Increase over previous year
	<i>Pounds</i>	<i>Per cent</i>
1923.....	101,695	7.2
1924.....	112,471	10.5
1925.....	113,356	1.0
1926.....	118,061	4.5
1927.....	147,589	25.0

In addition, the ink section produced during the last year 1,000 gallons, or 4,000 quarts, of blue-black writing inks of two qualities, and 900 quarts, or 1,800 pints, of red writing ink.

The largest amount of ink supplied to various Government establishments was for multigraph and mimeograph purposes. A total of 17,742 pounds of black mimeograph ink for open and closed type machines, 1,298 pounds of black multigraph ink of two qualities, and 150 pounds of red, blue, and green multigraph ink was produced during the year.

An indelible black printing ink was developed at the request of the Post Office Department for the precanceling of postage stamps. A total of 1,200 pounds of this ink was supplied during the year.

The Weather Bureau, Department of Agriculture, was furnished with 840 pounds of various kinds of printing ink, some of which was produced specially for their use.

A total of 1,183 pounds of stamp-pad and numbering-machine inks, in 4 and 8 ounce cans, of three colors, red, blue, and black, was also manufactured and furnished to various Government agencies.

The production of the various inks for the use of the different Government agencies required considerable research work in order to furnish the most suitable material and to meet the varied requirements. All of the formulæ used in the production of these inks were developed by the chemists of the division of tests and technical control. As a result of this work the Government is now securing ink of superior quality to that formerly obtained and at a substantial saving, as will be noted in this report under the heading "Supplies furnished other departments."

REDUCTION IN NUMBER OF INKS PRODUCED

Last year 75 different kinds of ink were manufactured by the ink section to meet the requirements of the Government Printing Office. A wide variety of different kinds and shades of ink is used to meet the varied requirements of printing for the Government. During the last year every effort has been exerted to reduce the number of different inks manufactured to a minimum and still meet all requirements. This year a total of 55 different inks was manufactured, including 15 kinds which were not manufactured in sufficient quantities to be listed last year; 3 kinds of writing inks; 3 colors each of stamp-pad and numbering-machine inks; black canceling printing ink for the Post Office Department; snuff-brown printing ink for the Weather Bureau; 2 mimeograph inks; and 2 black multigraph inks.

The following tabulation gives the amount of each kind of printing ink manufactured during the year, the small amount produced in several instances being due to the special shades required to match the copy for certain jobs:

Ink production, 1927

Kind of ink	Pounds	Kind of ink	Pounds
Black:		Blue—Continued.	
Book.....	33,342	Stationery.....	346
Job.....	21,444	Money order.....	254
Rotary halftone.....	14,495	Shipping Board.....	256
Record.....	13,309	Stamp pad.....	101
Halftone.....	12,974	Numbering machine.....	85
Mimeograph, open cylinder type.....	11,677	Embossing.....	93
Mimeograph, closed cylinder type.....	6,055	Pan American.....	84
Stationery job.....	6,136	Book cloth.....	17
Money order.....	1,955	Marble paper.....	16
Carbon coating.....	1,534	Green:	
Canceling.....	1,210	Postal card.....	6,552
Multigraph, grade A.....	842	French medium, for printing and	
Multigraph, grade B.....	456	multigraph use.....	548
Proof press.....	783	Slate, sensitive.....	126
Eulogy.....	412	Windshield.....	34
Addressograph.....	365	Olive cross line.....	14
Stamp pad.....	547	Book cloth.....	13
Numbering machine.....	115	Red:	
Spot carbonizing.....	84	Job, for printing and multigraph use.....	634
Book cloth.....	33	Poster.....	193
Book (made from waste ink).....	5,520	Marble paper.....	179
Yellow:		Stamp pad.....	211
Tampa.....	1,141	Numbering machine.....	162
Orange.....	796	Passport seal.....	26
Lemon.....	614	Book cloth.....	13
Orange poster.....	10	Miscellaneous:	
Brown:		Special shades, experimental inks,	
Snuff.....	599	etc.....	155
Bismark.....	276	Cream marble paper.....	76
Blue:		Gold marble paper.....	13
Bronze, for printing and multigraph			
use.....	490		

REDUCTION IN QUANTITY OF WASTE INK

The problem of waste ink returned from the press division has been the subject of constant study since the ink section was placed under the direction of the division of tests and technical control in April, 1924. Every effort has been made to reduce this waste to a minimum. The amount of waste ink was materially reduced during the year. The following tabulation shows the amount of waste ink returned to the ink section during the last five years, together with the percentage relation of the waste ink to the total ink production for the same year:

Waste ink returned by the press division

Fiscal year	Amount	Ratio of waste ink to total ink produced each year
	<i>Pounds</i>	<i>Per cent</i>
1923.....	13,650	13.4
1924.....	14,785	13.1
1925.....	12,350	9.25
1926.....	9,896	8.4
1927.....	5,520	3.7

The waste ink was reduced from 13.4 per cent of the total production of 101,695 pounds in 1923 to 3.7 per cent of the total production of 147,589 pounds in 1927. The value of this 10 per cent reduction, calculated on the total 1927 production, amounts to a saving of approximately \$4,500.

It should be stated in this connection that all waste ink returned to the ink section is utilized in the production of book ink and is therefore not a material loss. The chief causes for waste ink in the press division are due to incomplete removal of ink from cans, surface of ink skinned over by drying, paper lint or skins in ink removed from press fountain, and improper protection of ink left in cans.

The reduction in waste ink has been due mainly to the following changes which were put into effect during the year 1926:

1. All ink containers are scraped clean of old ink and thoroughly washed before being reused.
2. The dimensions adopted for all cans specify shallow cans of wide diameter, facilitating complete removal of the ink from the can by the press division. The cans formerly used were deep and narrow and were therefore difficult to scrape clean.
3. All ink immediately after being canned is covered with oiled paper before the lid is put on the can. The large containers in which book and record inks are sent to the pressroom are also covered with oiled paper. This prevents the formation of skins on the surface of the ink and also keeps out dust and paper lint. The paper can be replaced after part of the ink has been removed, thus preserving the remaining contents of the can for future use.
4. Rolled rims on the lids as well as on the edges of cans are also specified. This feature adds considerable strength to the cans, makes them much easier to open, and materially increases the life of the cans, effecting considerable economy.

RESEARCH ON PRINTING INKS

An additional chemist experienced in the manufacture of printing inks has been added to the personnel of the division of tests and technical control and extensive plans have been outlined for next year relative to the standardization of all materials used in the manufacture of printing ink, including any necessary revision of the present specifications for such materials, the testing of new materials not previously used by the Government Printing Office, and the standardization of the formulæ for all inks manufactured by the office. In this work particular attention will be given to securing the best quality of ink for each specific purpose. Methods of testing the finished inks will be adopted in order to secure uniformity in the quality of every lot of ink produced.

The work which has been planned will be of considerable interest to all consumers of printing ink, as there appears to be no public data available at present on methods of checking the quality and production value of printing ink. The results of this investigation will also be of considerable value in connection with the work being conducted relative to the measurement of the relationship of paper to printing ink.

DETECTION OF FRAUDULENT POSTMARK

The importance of definite technical specifications for materials was shown in the case of the United States *v.* B. G. Lipscomb, who was convicted of perjury in the United States District Court at Tulsa, Okla., in September, 1927. At the trial the technical director was called upon for expert testimony in connection with the ink alleged to have been used by Lipscomb for canceling a post-card stamp. The Post Office Department offered as evidence against Lipscomb a post card on which it was claimed that the postmark was a counterfeit. The card had been used as evidence as an alibi at a previous trial to secure an acquittal on a charge of violating the prohibition act. The technical experts of the Government Printing Office were requested to make a chemical examination of the ink used for canceling the questioned postmark and to compare it with the ink used by the Post Office Department for canceling United States mail. The examination showed the ink used in making the cancellation on the postal card was not the same as that used by the Post Office Department. The testimony of the technical director in conjunction with that of the Post Office inspection service brought a conviction in the case, the jury being shown that the ink used for the counterfeit mark could be removed easily by chemical bleaching agents which had no effect on the regular ink used by the Government.

INVESTIGATIONS OF BOOKBINDING MATERIALS

Considerable technical research has been conducted since the establishment of the division of tests and technical control relative to the quality of various materials used in bookbinding. Reference is made in this report to all results so far obtained.

FLAX BOOKBINDING TWINE

One of the first investigations made was on flax book twine for use in high-grade bindings, the results of which have been published

in various trade journals. As a result of this investigation, standard specifications were developed for all plies of best-quality flax book-binding twine, and all twine of this quality now purchased by the Government Printing Office complies with these specifications. A decided improvement has been noted in the serviceability and durability of books bound since the adoption of the specifications. Previously, jute and mixtures of jute and hemp twines were furnished the office as "best-quality" flax twine, which proved very unsatisfactory in service and unsuitable for permanent high-grade bindings. Reference was made to the results of this investigation in the annual report of the Public Printer for 1923.

BINDERY RULING INKS

An article has also been published in trade journals giving the results of an extended investigation conducted on ruling inks and dyes. A complete report of this investigation was made in the annual report of the Public Printer for 1926. The results of this investigation have been of considerable value to the Government Printing Office, which now purchases all its ruling inks and dyes in accordance therewith.

BINDERY GLUE

One of the most important investigations conducted was relative to glue, which is a most essential material in the bindery. This investigation included methods for testing the quality of glue, the preparation of definite specifications for the various qualities used by the Government Printing Office, methods for the economical handling of glue in the plant, and the development of formulæ for flexible glues for various bindery uses. A full report was made in the annual report of the Public Printer for 1926. Additional information in this connection is given in this report under "Glue investigations."

BOOKBINDING CLOTHS

Much work has been done relative to the quality of various book-binding cloths for the purpose of developing standard specifications. Since the establishment of the division of tests and technical control in 1922, approximately 900 samples of various kinds of bookbinding cloths have been tested, representing samples from all deliveries received, samples offered by bidders, and investigational samples obtained from available sources of bookbinding cloths. This work has been conducted in cooperation with the manufacturers of book cloths and of imitation-leather fabrics.

As a result of this work, standard specifications have been developed and adopted for the following book cloths used by the Government Printing Office: Book cloth, common colors; book cloth, extra colors; heavy-weight buckram; medium-weight buckram; light-weight book cloth, vellum finish; medium-weight book cloth, vellum finish; imitation leather; cotton drilling; and cotton duck.

The specifications state the quality of stock and the minimum requirements for weight, weave, and tensile strength. Owing to the difficulty of defining color, finish, pattern, and general characteristics, samples are required for this purpose. The samples are also tested

for permanency of the colors to light and the resistance of the cloth to attack by insects.

Due to the wide variation in the qualities of cloths commercially offered for bookbinding purposes, the importance of specifications covering the quality can be readily appreciated. If the finishing materials used in the manufacture of a book cloth are removed and the base cloth inspected, it will be noted that base cloths of the cheaper grades are of a very open weave and possess but little strength. In the better qualities, the base cloths are close woven and possess good strength. The serviceability and durability of bookbinding cloths are dependent primarily on the quality of the base cloth.

In order to secure the finishes and other characteristics desired for bookbinding cloths, finishing materials, consisting of sizings and mineral fillers, are added to the base cloth. There is no doubt but that the most serviceable book-cloth bindings from all standpoints would be obtained by the use of fabrics containing no finishing materials, such as sizing or mineral fillers, whatsoever. Such cloth would be immune to attack by insects, would be flexible, and its serviceability would depend upon the weave and strength of the cloth. However, in the production of a fabric for bookbinding purposes, there are certain requirements that must be met in order that the cloth can be handled in the bindery with the modern machinery that is necessary to secure volume production of book cases.

Book cloths must have sufficient stiffness to carry on the machines properly and must be so filled that the adhesives will not penetrate through the cloth. In order to obtain book cloths of maximum serviceability, it would be advisable to use the minimum quantity of filling and sizing materials, and for this reason considerable data have been obtained for the purpose of establishing the maximum amount which should be allowed in the various kinds of bookbinding cloths. It is appreciated, however, that the use of large amounts of finishing materials produce effects which appear to be desired by the book buyer, and also permit the production of cheap-grade binding materials.

However, an open-weave base cloth containing an excessive amount of finishing materials lacks flexibility and resistance to tear. Of two book cloths having the same quality base cloth, the one containing the lesser amount of finishing materials will be the more serviceable for bookbinding purposes.

In the following tabulation are given the percentages of mineral matter and sizings used in the finishing materials of various types of standard bookbinding cloths used by the Government Printing Office. This tabulation shows that the cheaper grades of book cloth contain the larger percentage of finishing materials, while the better quality book cloths, such as buckrams, show the lesser amount.

Results showing percentage of finishing materials in bookbinding cloths

HEAVY-WEIGHT BUCKRAM

Test No.	Color	Weight per square yard	Weight per square yard of base cloth after removal of finishing materials	Total extracted finishing materials, including sizing and mineral matter	Ash or mineral matter	Sizings ¹
		Ounces	Ounces	Per cent	Per cent	Per cent
20379	Brown.....	9.7	7.9	18.4	4.4	14.0
22931	Dark brown.....	9.7	7.6	21.6	3.5	18.1

MEDIUM-WEIGHT BUCKRAM

21716	Blue.....	7.2	6.0	16.5	3.2	13.3
23899	Red.....	7.7	6.0	22.5	4.1	18.4
23346	do.....	7.3	5.1	30.2	4.5	25.7
29231	Brown.....	7.1	5.0	30.0	4.3	25.7

BOOK CLOTH, COMMON COLORS

23638	Gray.....	5.0	3.1	37.0	7.5	29.5
23639	do.....	6.0	3.4	43.5	4.2	39.3

BOOK CLOTH, EXTRA COLORS

22520	Red.....	6.0	2.8	53.7	7.1	46.6
23831	Green.....	5.3	2.8	48.0	11.4	36.6

LIGHT-WEIGHT BOOK CLOTH, VELLUM FINISH

21542	Green.....	5.0	2.4	52.5	9.2	43.3
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MEDIUM-WEIGHT BOOK CLOTH, VELLUM FINISH

19396	Yellow.....	6.4	3.9	39.0	12.0	27.0
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IMITATION LEATHER

Test No.	Color	Weight per square yard	Weight per square yard of base cloth after removal of finishing materials	Cellulose coating and mineral matter	Ash or mineral matter	Cellulose coating material and softening oils
		Ounces	Ounces	Per cent	Per cent	Per cent
17458	Black.....	7.4	4.1	44.6	6.3	38.3
21483	do.....	7.4	4.0	45.8	2.1	43.7

¹ Obtained by difference between total extracted materials and ash.

NOTE.—Extractions were made with acidulated water on all book cloths for determination of total sizing material. Organic solvents were used for the removal of the coating on imitation leather.

Imitation leathers are fabric-base book cloths coated with flexible cellulose compounds. This cellulose coating is pliable and improves rather than injures the serviceability or wearing resistance of the

cloth. However, as with other bookbinding cloths, the quality of the base cloth is a controlling factor in the serviceability of cellulose-coated fabrics. The standard specifications adopted for imitation leather, in addition to specifying the weight, weave, and tensile strength, state that the base cloth shall be an unsized and unfilled cotton cloth.

DESTRUCTION OF BOOKBINDING CLOTHS BY INSECTS

One of the most serious problems which arises in connection with bookbinding cloths is the destruction of book covers by insects. Considerable investigational work has been conducted on this subject and a large number of bookbinding cloths and cases have been exposed to attack by insects. This work shows that most book cloths are readily attacked by insects, owing to the amount and kind of sizing materials in the cloth, such as starch, dextrins, flour, and other gums that offer an attractive food for insects. Book-cloth manufacturers have made much effort from time to time to overcome this defect by adding certain ingredients to the finishing materials to repel attacks by insects. However, experience has shown that, although these treatments in some cases with some insects have given good results, most of them under certain conditions fail to accomplish the desired purpose. Book cloths containing a lesser amount of finishing materials, such as buckrams, are more resistant to attack by insects. Continued investigations will undoubtedly yield a book cloth which will be resistant to insects under most conditions.

From the results obtained by the Government Printing Office, it seems that the cloth itself, and not the adhesives used in manufacturing book cases, is the primary cause for the destruction of bookbindings by insects. Data have been secured that the adhesives used in producing a book case are not the cause under normal conditions for attack by insects. Book cases made up with book cloths which are insect resistant in themselves, such as drilling, duck, and imitation leather, have shown no indication of attack by insects, although no insect-repellant materials were added to the adhesives used.

Book cloths not resistant to attack by insects have shown practically the same amount of damage if exposed to insects alone as when the same cloth is glued to binders' board with the usual adhesives, and no insect-repellant materials used.

The only book cloths which have resisted attack by insects are imitation-leather or cellulose-coated fabric, oilcloth, and unsized duck and drilling. It should be stated, however, that the tests have been made in Washington or in temperate climates, and these results should not be considered conclusive for all climatic conditions. The most serious damage is done by insects in tropical countries or under warm and humid atmospheric conditions.

Experiments have also been conducted by treating the surface of book-cloth bindings with certain sizing materials and varnishes for the purpose of rendering them resistant to attack by insects. For this purpose spar varnish, shellac, and cellulose lacquers have been used. The results indicate that flexible cellulose lacquers are satisfactory, possess better durability, have no injurious effect on the cloth, are flexible, and impart a pleasing finish to the cloth.

All of the tests have been conducted by exposing the various book cloths or book cases made from the book cloths in localities known to

be frequented by insects, both the "croton," or common water bug, and the large American roach. The tests have not been made under abnormal conditions, such as imprisoning insects in bell jars with the material to be tested, that are not indicative of actual conditions to which books are exposed.

Considerable assistance has been rendered the division of tests and technical control in connection with its investigations relative to the attacks by insects on bookbinding cloths by the techno-chemical division, Bureau of Chemistry and Soils, Department of Agriculture.

BOOKBINDING LEATHER

During recent years the use of leather for high-grade bookbinding purposes has been replaced to a large extent by bookbinding cloths and imitation leathers or cellulose-coated fabrics. This has not been due entirely to the high cost of leather bindings but primarily to the inability to secure serviceable and durable bookbinding leathers. Inspection of the books in libraries will show the rapid deterioration that has occurred in most leather bookbindings, especially during the last 50 or 60 years.

Realizing the importance of using only bookbinding leathers of the highest quality when books are bound in leather for Government libraries, the Government Printing Office has endeavored to secure information relative to the essential qualities to be specified for such leather. Considerable difficulty has been experienced in obtaining domestic leather which would comply with the adopted specifications, and in many instances where highest quality was desired it has been necessary to procure foreign bookbinding leather. The following specifications have been adopted tentatively for use in the purchase of bookbinding leather:

Best-quality durable bookbinding leather.—Must be tanned exclusively with pyrogallol tanning materials and shall be free from mineral acids and contain not more than 0.25 per cent acidity as determined by the Proctor and Searle method on moisture-free basis. Dyes that will impart acidity to the leather must not be used.

Award will be made only on leather fully complying with these specifications and of best quality as determined by other chemical and physical tests. The leather must be "full binding quality," free from cuts, scars, and blemishes.

The most essential points in a durable bookbinding leather are freedom from mineral acids and catechol tanning materials. Sumac-tanned leather or leather tanned with materials of the pyrogallol group have been found the most durable for bookbinding leather. Tanning materials belonging to the catechol group have been found decidedly unsatisfactory for permanent-quality bookbinding leathers.

A large collection of English and German bookbinding leathers was secured by the technical director during his trip to Europe in the summer of 1926. These samples represent the highest quality bookbinding leathers obtainable in Europe and were represented to be sumac tanned, acid free, and produced in accordance with the recommendations of the "Report of the committee of the British Society of Arts on leather for bookbinding" issued in London in 1901. Thirty skins of various kinds of bookbinding leather were obtained, including goat, sheep, pig, cow, and calf. Complete chemical and physical analyses are being made of the skins. Books have been bound with these leathers for the Library of Congress, library of the

Department of Justice, and library of the Department of the Interior. Books bound with the foreign leathers are marked and recorded so that a careful record can be kept as to their durability and serviceability in actual use.

The Government Printing Office is indebted to the cordial cooperation of the leather section of the techno-chemical division, Bureau of Chemistry and Soils, Department of Agriculture, in connection with the investigation on bookbinding leather. The specifications adopted were recommended by that division and practically all analyses on bookbinding leathers have been made by its laboratory.

Cooperative work is now being conducted with American tanners to develop the production of durable bookbinding leathers tanned in accordance with recognized standards for durable leather.

INVESTIGATION ON IMITATION GOLD LEAF

As a result of the rapid discoloration and tarnishing of imitation gold stamped work on book covers, an investigation was conducted to develop a laboratory method of testing imitation gold stamping leaf.

An inspection of a considerable number of books which had been stamped with imitation gold leaf showed a wide variation in the amount of discoloration of the stamping. The following are among the causes of these variations: (a) Difference in the quality of the stamping leaf used; (b) difference in material stamped; (c) difference in conditions under which the books are stored, as some might be more exposed to chemical fumes, moisture, heat, and light than others. This inspection led to the conclusion that a considerable portion of the discoloration was probably due to the action of sulphides from various gases in the air and to some extent to the action of heat and light.

Exposure of stamped book covers to hydrogen sulphide gave results which resembled very closely the tarnishing that develops on most samples of imitation gold leaf. There was a wide variation in the effect of this treatment on the different samples. All were affected, but some were only slightly tarnished, while others were not only tarnished but were completely blackened.

Exposure to sulphur dioxide did not show the differences between samples to nearly the same extent as did hydrogen sulphide. The results, however, were corroborative.

Tests made with the fadeometer gave results indicating similar discoloration to the exposure tests with hydrogen sulphide and sulphur dioxide. It was also noted that the stamping on black material was affected more than that on the red material in the same length of time. This was no doubt due to the greater absorption of light and heat by the darker material. Further work is planned in this connection, using a wide variety of colored bookbinding materials and studying the effect of the dye or pigment in the binding material on the stamping materials.

A set of covers exposed in the laboratory indicated the same relative tarnishing of the stamped work as in the other tests. Laboratory tests therefore will give results in one or two days indicative of those obtained in longer actual service under normal conditions.

The results obtained in all cases indicated the same relative differences in the quality of the various samples of stamping leaf. How-

ever, the effect of the hydrogen sulphide test was much more evident than in the case of the other tests. Therefore, it appears necessary only to use the hydrogen sulphide test on imitation gold stamping leaf.

The results of the tests indicate that they will give comparative data as to the serviceability of different makes of imitation gold stamping leaf, and all such material purchased by the Government Printing Office is now tested in accordance with these methods.

The aluminum leaf and the 22.5-karat gold leaf were unaffected in any of the tests.

Technical investigations have also been conducted on various other bookbinding materials, as a result of which standard specifications have been adopted covering the following materials: Two qualities of super, silesias, various widths and weights of cotton sheeting, filled cotton cloth, and different kinds of jute and cotton twines for wrapping purposes.

INVESTIGATION ON QUALITY OF BINDER'S BOARD

Definite specifications for binder's boards, best quality and No. 2 quality, have been developed from extensive tests made by the division of tests and technical control on these materials. These specifications were adopted by the paper specifications committee for the fiscal year beginning March 1, 1928. They are the first definite specifications to be used by the Government in the purchase of binder's boards.

Considerable difficulty has been experienced in purchasing linen and cotton book sewing threads of a satisfactory quality, and an investigation is now being undertaken to develop standard specifications for these materials. The investigation covers fiber stock, size of thread, finish, yardage, and strength.

GLUE INVESTIGATIONS

During the past two years reference has been made in the annual reports of the division of tests and technical control to the investigations which were being conducted relative to glue, one of the most important materials used in the bindery. The results of this work were published in complete form in last year's report and have attracted widespread interest among commercial bookbinders and glue manufacturers. As a result of these investigations, methods have been adopted for the testing of glue and specifications developed for the necessary glues for the use of the Government Printing Office.

Improved methods have also been adopted for handling glue, and formulæ developed for flexible glues to meet the various requirements of the office.

Owing to the interest manifested in this investigation by commercial concerns, it is deemed advisable to republish in detail the glue specifications and the formulæ for the molded glues used by the Government Printing Office, since minor changes have been made in the specifications and two new formulæ have been added to those submitted last year. In using these formulæ it is of the utmost importance that the glues be of the respective qualities covered by the specifications.

SPECIFICATIONS FOR GLUES

All glue shall be clean and free from foreign matter. A solution of any grade shall not develop a strong or sour odor when kept 48 hours at a temperature of 25° to 35° C. Tests will be based on a 12 per cent moisture content and will be made according to the methods adopted by the National Association of Glue Manufacturers. Deliveries to be made in paper-lined bags or paper-lined wooden barrels.

GLUE NO. 1

Bone or hide glue, ground, for general bindery use:

Viscosity—Not less than 50 millipoises.

Jell strength—Not less than 130 grams.

pH value—Not less than 6.0 nor more than 7.0.

GLUE NO. 2

Bone or hide glue, ground, quick-setting and nonfoaming:

Viscosity—Not less than 60 millipoises.

Jell strength—Not less than 165 grams.

pH value—Not less than 6.0 nor more than 7.0.

GLUE NO. 3

High-grade hide glue, ground or flake, for roller manufacture and bindery use:

Viscosity—Not less than 130 millipoises.

Jell strength—Not less than 400 grams.

pH value—Not less than 6.4 nor more than 7.0.

FORMULÆ FOR MOLDED GLUES

The following formulæ give the ingredients used in the preparation of approximately 350 pounds of material in each case. The glue after soaking in cold water is melted at a temperature of not over 150° F., the other ingredients added, and then the melted mixture is poured into moulds of approximately 10 pounds each. The melted glue is strained through fine-wire screens in order to remove any lumps, trace of dirt, or other foreign material. When chilled, the molded glue is stored in a refrigerator ready for use.

Regular flexible molded glue for general bindery use:

Glue No. 1.....	pounds..	123
Glycerin.....	do....	90
Water.....	do....	123
Beta naphthol.....	ounces..	8
Terpineol.....	do....	8

Extra flexible, for use on gathering, stitching, and covering machines and wherever a high-quality, quick-setting, flexible glue is required:

Glue No. 2.....	pounds..	75
Glue No. 3.....	do....	75
Glycerin.....	do....	64
Water.....	do....	134
Beta naphthol.....	ounces..	8
Terpineol.....	do....	8

Perfect binder flexible, for use on Perfect binding machine:

Glue No. 3.....	pounds..	150
Glycerin.....	do....	105
Water.....	do....	135
Beta naphthol.....	do....	8
Terpineol.....	do....	8

Tablet composition:

Glue No. 1.....	pounds..	120
Glycerin.....	do....	113
Water.....	do....	113
Zinc oxide.....	do....	5
Beta naphthol.....	ounces..	8
Terpineol.....	do....	8

Regular bindery, for use in modifying other glues when necessitated by weather conditions:

Glue No. 1.....	pounds..	175
Glycerin.....	do.....	10
Water.....	do.....	175
Beta naphthol.....	ounces..	8
Terpineol.....	do.....	8

Case making, for use in case-making machines:

Glue No. 2.....	pounds..	175
Glycerin.....	do.....	10
Water.....	do.....	175
Beta naphthol.....	ounces..	8
Terpineol.....	do.....	8

Cabinetmaking:

Glue No. 2.....	pounds..	87½
Glue No. 3.....	do.....	87½
Glycerin.....	do.....	10
Water.....	do.....	175
Beta naphthol.....	ounces..	8
Terpineol.....	do.....	8

Molded-glue formulæ now contain two ingredients, beta naphthol and terpineol, which are added to prevent mold and bacterial action and to give the glue an agreeable odor. An investigation is now under way to determine the most efficient materials for the prevention of mold and bacterial action in molded glues.

UTILIZATION OF WASTE ROLLER COMPOSITION

Waste press-roller composition has been utilized during the last two years in the manufacture of glue for bindery purposes as a result of research conducted by the division of tests and technical control. This is feasible only where the character and quality of such composition are known. For instance, if molasses or similar material for toughening the composition is used in the production of rollers, the discarded composition will not melt and can not be used. Molasses is not used in the manufacture of rollers by the Government Printing Office. The glue, glycerin, and other materials used are purchased on definite specifications for quality. The waste composition can, therefore, be used by the Government Printing Office in the manufacture of molded glues without difficulty. The chief use of this material is in the production of tablet composition. It is also utilized to a certain extent in two other formulæ for molded glues.

Following are the formulæ for the molded glues in which waste roller composition is used by the Government Printing Office:

Regular flexible, for general bindery uses:

Glue No. 1.....	pounds..	123
Glycerin.....	do.....	50
Waste roller composition.....	do.....	40
Water.....	do.....	123
Beta naphthol.....	ounces..	8
Terpineol.....	do.....	8

Tablet composition:

Waste roller composition.....	pounds..	200
Glue No. 1.....	do.....	20
Water.....	do.....	90
Zinc oxide.....	do.....	5

Regular bindery, for use in modifying other glues when necessitated by weather conditions:

Glue No. 1.....	pounds..	175
Waste roller composition.....	do.....	30
Water.....	do.....	175
Beta naphthol.....	ounces..	8
Terpineol.....	do.....	8

At the recommendation of the technical director the manufacture of molded glue for bindery uses was transferred last year to the roller and glue section, where more modern equipment was available, thereby consolidating the handling of glue in one section. During the year 74,640 pounds of molded glue were produced, as follows:

	Pounds
Regular flexible.....	24, 000
Extra flexible.....	12, 780
Perfect binder flexible.....	1, 850
Regular bindery.....	11, 520
Case making.....	19, 780
Tablet composition.....	4, 670

The above includes 1,422 pounds of the various glues supplied to different Government agencies and not used by the Government Printing Office.

The following materials were used in the manufacture of the molded glues, not including the glue and glycerin used in the manufacture of press rollers:

	Pounds
Glue No. 1.....	15, 185
Glue No. 2.....	12, 155
Glue No. 3.....	3, 600
Glycerin.....	6, 664
Waste roller composition.....	7, 560

At the request of the Post Office Department, special samples of glue-glycerin composition, similar to that used for press rollers, were submitted for test in the production of composition canceling stamps. The samples were reported to be superior to the material previously used, giving from two to three times longer service. This composition is now being supplied at an appreciable saving.

As a result of the investigations on glue, the amount of glue purchased annually has been decreased materially. In 1921 60,750 pounds of glue were purchased at a cost of \$7,031.50, while in 1927 30,940 pounds were purchased at a cost of \$3,950, a saving of \$3,100.

In addition, 7,500 pounds of waste roller composition are used annually, having a value of approximately \$1,150 when used as glue. This material was formerly sold as waste.

There were also over 1,400 pounds of molded glues furnished Government agencies in 1927. None had been furnished previous to this fiscal year.

In addition to the above-mentioned savings, the quality of the work in which glue is used shows a marked improvement over that done prior to the adoption of technical methods of testing glue, the adoption of methods for handling glues, and the development of formulæ for flexible glues.

DETERGENTS

The previous recommendations made by the division of tests and technical control as a result of its extended investigation on solvent and alkali detergents for the removal of printing inks from type, the removal of wax from electrotpe shells, the cleaning of press rollers, and the cleaning of ink containers have been followed during the year without change and excellent results are being obtained throughout the office. A full report of this investigation has been published in trade journals and in the annual report of the Public Printer for 1925. The investigation has proven of interest to the commercial printers and considerable information has been furnished by the Government Printing Office relative to the proper detergents to be used for any specific purpose.

As a result of the investigations relative to detergents for use in the printing and press divisions and for laundry and general cleaning purposes, a saving of approximately \$10,000 has been made, compared with the cost of a similar quality of materials formerly used for the specific purposes.

SUPPLIES FURNISHED OTHER GOVERNMENT AGENCIES

During the fiscal year 1927 considerable quantities of miscellaneous supplies, such as inks, glues, and paste, have been furnished to the various departments and independent establishments of the Government in accordance with the following provision of Public Act 222, Sixty-ninth Congress:

Provided, That inks, glues, and other supplies manufactured by the Government Printing Office in connection with its work may be furnished to departments and other establishments of the Government upon requisition, and payment made from appropriations available therefor:

In the following tabulation is given a complete report relative to the kinds and quantities of materials supplied to the various Government agencies. There is also stated the charges made for these materials by the Government Printing Office and the corresponding commercial prices. The latter prices are quoted from contract awards of the General Supply Committee. On items not carried on the General Supply Schedule, the prices formerly paid were reported by the department purchasing such material.

Record of miscellaneous materials furnished to all Government agencies, fiscal year 1926-27

Kind of material	Amount furnished	Government Printing Office charge	Cost to departments through former channels	Savings to Government
Printing inks:				
Black—				
Canceling.....	1,200 pounds.....	\$600. 00	\$1,200. 00	\$600. 00
Miscellaneous.....	604 pounds.....	273. 15	500. 60	227. 45
Colored—				
Snuff brown.....	590 pounds.....	354. 00	590. 00	236. 00
Other colors.....	66 pounds.....	43. 55	86. 85	43. 30
Multigraph inks:				
Black—				
Grade A.....	772 pounds.....	424. 60	1,003. 60	579. 00
Grade B.....	195 pounds.....	48. 75	253. 50	204. 75
Colored.....	142 pounds.....	104. 80	344. 05	239. 25

Record of miscellaneous materials furnished to all Government agencies, fiscal year 1926-27—Continued

Kind of material	Amount furnished	Government Printing Office charge	Cost to departments through former channels	Savings to Government
Mimeograph inks:				
For open cylinder machines.....	4,716 pounds in 4-pound cans.....	\$2,593.80	\$7,074.00	\$4,480.20
Do.....	7,129 pounds in 1-pound cans.....	4,277.40	10,693.50	6,416.10
For closed cylinder machines.....	1,534 pounds in 4-pound cans.....	843.70	2,301.00	1,457.30
Do.....	3,779 pounds in 1-pound cans.....	2,267.40	5,668.50	3,401.10
Numbering-machine inks:				
Red.....	51 pounds.....	238.75	815.67	576.92
Blue.....	66 pounds.....			
Black.....	72 pounds.....			
Stamp-pad inks:				
Red.....	240 pounds.....	497.65	614.42	116.77
Blue.....	152 pounds.....			
Black.....	534 pounds.....			
Green.....	4 pounds.....			
Writing inks:				
Blue-black for fountain pen and office use.....	227½ gallons in quart bottles.....	182.00	962.37	449.60
Do.....	689 gallons in gallon or larger containers (not including containers).	330.72		
Blue-black record.....	62 gallons in quart bottles.....	59.72	148.96	57.24
Do.....	50 gallons in gallon or larger containers (not including containers).	32.00		
Red.....	47 gallons in quart bottles.....	26.32	246.68	121.66
Do.....	91¼ gallons in pint bottles.....	73.40		
Do.....	126½ gallons in gallon or larger containers.	25.30		
Molded glues.....	1,422 pounds.....	191.91	318.90	126.99
Miscellaneous:				
Flour paste.....	4,070 pounds.....	122.10	191.29	69.18
Ink solvent.....	5 gallons.....	6.25	17.50	11.25
Addressograph inks:				
Black.....	309 pounds.....	309.00	843.57	534.57
Blue.....	11 pounds.....	11.00	36.96	25.96
Purple writing ink for duplicators.....	4½ pounds.....	9.00	18.00	9.00
Total.....		13,976.57	34,059.87	20,083.30

It will be noted from the foregoing tabulation that inks, glues, and paste were furnished to the various departments at a total charge of \$13,976.57. The same quantity of materials, if purchased through the General Supply Committee contracts or former sources of supply, would have cost the Government \$34,059.87. Therefore, a saving of \$20,083.30 to the Government during the fiscal year was effected in the manufacture of these supplies by the Government Printing Office, as authorized by law.

A careful study of the total quantities of the materials which will be supplied by the Government Printing Office in accordance with the provisions of law, indicates that the supplies furnished represent only approximately six months' requirements for the fiscal year. The savings for a full year should effect an economy of between \$30,000 and \$35,000.

During the fiscal year 1927 three schedules were issued listing materials, with prices, which could be furnished to the departments by the Government Printing Office.

Most Government agencies have purchased writing inks in 1-gallon and 5-gallon containers, filling their own quart bottles, which proved to be economical and satisfactory. However, to meet the requirements of small offices, the Government Printing Office is prepared to

furnish blue-black writing inks in quart bottles, and red ink in pint bottles.

All orders for such materials have been handled through the division of tests and technical control and practically all were made by the ink and glue sections. The quality of the materials furnished to the departments is equal to and in most cases superior to that formerly obtained from commercial sources.

COOPERATION WITH VARIOUS INDUSTRIES

The division of tests and technical control has continued to cooperate with commercial concerns furnishing materials to the Government Printing Office, for the purpose of developing specifications for various materials, and to supply reliable information to Government bidders and contractors as to the requirements of the Government Printing Office.

Cooperative work has been continued with the National Association of Glue Manufacturers in connection with glue, and with the United Typothetæ of America and the paper manufacturers relative to the standardization of paper. Cooperative investigations are now being started with the mechanical section of the American Newspaper Publishers Association relative to type-metal alloys of all kinds and newsprint paper.

During the last year the inquiries from commercial concerns interested in the research work being conducted by the Government Printing Office have been very heavy. Approximately 2,000 letters have been written during the year in supplying desired information. These requests have been for information on specifications for paper and other materials used in printing, binding, and allied industries. Considerable information has been requested relative to type-metal alloys. Information has also been requested relative to bookbinding materials, and for assistance in production difficulties experienced in various commercial plants similar to those met by the Government Printing Office.

Owing to the interest displayed in the annual report of the technical director printed in the annual report of the Public Printer for 1926, it was necessary to have 1,500 copies of this report reprinted and the supply has been practically exhausted.

The division of tests and technical control has rendered assistance to the Treasury Department, the Post Office Department, Library of Congress, and other Government agencies in connection with paper, inks, and glues, and problems which could be handled by the experienced chemists of the Government Printing Office.

The technical director is a member of the following committees and devotes considerable time in connection with the work of these committees:

Paper specifications committee of the Joint Committee on Printing; Federal Specifications Board; also the following Federal specifications committees: Paper technical committee, committee on inks and typewriter ribbons, technical committee on color, shipping-container committee, and committee on specifications for lubricants and liquid fuels.

During the year the technical director has delivered addresses on the technical work of the division of tests and technical control before

the Washington Club of Printing House Craftsmen and the mechanical section of the American Newspaper Publishers' Association, both of which have been published.

The importance of the work being conducted by the chemists of the division of tests and technical control of the Government Printing Office is shown by the following order issued by the Public Printer:

DIVISION OF TESTS AND TECHNICAL CONTROL

GOVERNMENT PRINTING OFFICE,
OFFICE OF THE PUBLIC PRINTER,
Washington, August 16, 1927.

To all Officers and Employees of the Government Printing Office:

The testing section on and after this date shall be designated as the division of tests and technical control and shall be under the supervision and direction of the technical director, who shall take over and perform the duties formerly assigned to the chief of tests. The division of tests and technical control shall take over and continue the work of the testing section and shall have full charge and direction of all testing and technical control and research, under the direction of the Public Printer, including the manufacture and supply of ink, type metal, press rollers, and bindery glue.

The ink room shall hereafter be designated as the ink section, the metal room as the metal section, and the roller room as the roller and glue section, all of which sections shall constitute a part of the division of tests and technical control and shall be under the direction and supervision of the technical director.

GEORGE H. CARTER, *Public Printer.*

Respectfully submitted.

EDWARD O. REED,
Technical Director.

DIVISION OF PUBLIC DOCUMENTS

REPORT OF THE SUPERINTENDENT OF DOCUMENTS

[Reprint of Report, pages 1 to 9, inclusive.]

REPORT OF THE SUPERINTENDENT OF DOCUMENTS

UNITED STATES GOVERNMENT PRINTING OFFICE,
OFFICE OF SUPERINTENDENT OF DOCUMENTS,
Washington, September 15, 1927.

To the PUBLIC PRINTER:

SIR: I have the honor to submit herewith the annual report of the Superintendent of Documents for the fiscal year ended June 30, 1927.

The activities connected with the distribution of Government publications during the last fiscal year have taxed to the limit the facilities of the public documents division, and it is the old story of growing interest in Government publications, combined with more publicity from some of the issuing offices. An analysis of the sales for the last five years shows an average increase in the receipts from sales of \$50,000 per year, as indicated below:

RECEIPTS FROM SALES

1922-1923	-----	\$382,368.18
1923-1924	-----	440,904.93
1924-1925	-----	487,922.63
1925-1926	-----	544,937.51
1926-1927	-----	594,840.25

Converting the departments to the sales idea has been slow work, but our advocacy of such a policy over a long period of years is gaining support throughout the various departments, with the inevitable result of increased sales. The Director of the Bureau of the Budget and the Chief Coordinator are giving considerable thought to the subject, as they seem convinced that all Government publications should be sold to the public except where it can be shown that free distribution is for the best interests of the public.

We hear from all sides that there should be wider publicity to the fact that we have a reference section, which not only prepares price lists on important and timely subjects but answers letters which require special knowledge and research. This is, no doubt, true, but at the present time we are unable to handle promptly requests for publications and information on account of the increase in the work, and it would not be advisable to broadcast the functions of the office until we are equipped to give better service.

It has been apparent for some time that the present organization needs to be expanded, and the committee that the Public Printer appointed in the latter part of April to consider various problems affecting the office is making a detailed study of the operations, and hopes to be able before long to submit a report of its findings, which would result in improved conditions and better service to the public.

DISTRIBUTION FOR THE DEPARTMENTS

There was a reduction of 2,795,013 in the number of publications mailed for the departments during the year, which was reflected almost entirely in the distribution made by the Department of Agriculture, due to the fact it was not a campaign year. Although 10,461,157 copies of publications were sold, the distribution of 44,905,264 copies of publications by the departments is evidence of a continuance of a very generous free distribution.

STORAGE OF PUBLICATIONS

Notwithstanding 1,705,692 copies of publications were taken from the departments' consigned stocks and destroyed as obsolete or excess copies, our books show an increase over last year in the total stock on hand. It is apparent that unless some drastic action is taken the time is not far distant when additional storage room will be required, as it is difficult now to find room for the current publications.

The committee, consisting of the Superintendent of Documents (chairman), the Deputy Public Printer, and the Superintendent of Accounts, which the Public Printer appointed to consider various problems affecting the documents office, met on several occasions for the purpose of drafting a policy with reference to handling the stocks of publications belonging to the departments that are now stored under the custody of the Public Printer. Preliminary to a general discussion the following sections of the printing law of January 12, 1895 (28 Stat. L. 610, 611), which are the only ones bearing on the subject, were read:

SEC. 61 (par. 5). He (the Superintendent of Documents) shall have general supervision of the distribution of all public documents, and to his custody shall be committed all documents subject to distribution, excepting those printed for the special official use of the executive departments, which shall be delivered to said departments, and those printed for the use of the two Houses of Congress, which shall be delivered to the folding rooms of said Houses and distributed or delivered ready for distribution to Members and Delegates upon their order by the superintendents of the folding rooms of the Senate and House of Representatives.

SEC. 67. All documents at present remaining in charge of the several executive departments, bureaus, and offices of the Government not required for official use shall be delivered to the Superintendent of Documents, and hereafter all public documents accumulating in said departments, bureaus, and offices not needed for official use shall be annually turned over to the Superintendent of Documents for distribution or sale.

Neither "official use" nor "special official use" is defined in the act, but the wording of other sections throws some light on what these terms may be considered to mean.

Section 92 (28 Stat. L. 623) provides that publications received for executive departments, "whether for official use or for distribution," shall be distributed by a competent person. Here is a clear-cut distinction between two classes, each of which is exclusive of the other, and neither of which needs definition. Publications for official use evidently include those needed in the internal operation of the department. The term "publications for distribution" speaks for itself.

The restriction of the term "official use" to distribution for the internal operation of the departments is further strengthened by the

language of section 90 (28 Stat. L. 623). This section provides that the departments shall cause an order to be sent to the Public Printer for documents, reports, bills, and resolutions "for official use." It can hardly be contended that Congress intended each of the departments to distribute documents, reports, and bills, but provision is made for the departments to acquire sufficient copies for the transaction of public business. In the case of documents and reports the quantity to be sent to the departments is limited to the "number of bureaus in the department and divisions in the office of the head thereof."

It is a well-recognized rule of construction that all parts of an act must be taken into consideration in construing any part. Therefore, the term "official use" as employed in section 67 must be interpreted in the light of the term "for official use or for distribution," as employed in section 92. The term "special official use," as employed in section 61, evidently is synonymous with "for official use," as used in section 92.

This interpretation allows a consistent application of the three sections. According to section 61 all departmental publications should be delivered to the departments, where they are to be distributed by a competent person, as required by section 92. Section 67 then provides that annually all publications not needed for official use shall be turned over to the Superintendent of Documents for distribution or sale. The printed debates show that Congress was interested in reducing the stock of publications by putting them in the hands of persons who could use them. This was to be accomplished by turning existing surplus publications over to the Superintendent of Documents and allowing the departments one year in which to distribute all subsequent publications.

The committee believes that those who drafted the printing act of 1895 had in mind the centralization of distribution, as section 61, paragraph 5, provides that the Superintendent of Documents shall have general supervision of the distribution and to his custody shall be committed all documents subject to distribution. Whereas, the same paragraph and section contains exceptions, which permit the departments, bureaus, and offices of the Government to exercise control over the distribution of their publications, it is evident that Congress intended that such control should be for but one year after the printing of a publication; otherwise there would have been no occasion for writing into the law section 67.

The act of August 23, 1912 (37 Stat. L. 414), has no bearing on the operation of section 67 of the act of 1895. The act of 1912 simply makes the Public Printer the agent of the departments in storing and mailing publications, the control of the departmental distribution remaining in the departments as before. The act of 1912 therefore supplements the act of 1895. Under the act of 1912 the Public Printer has no right to take a single copy without the permission of the department controlling the publication. But as section 67 of the act of 1895 has not been amended or modified, at the end of one year the Public Printer is justified in turning the surplus over to the Superintendent of Documents for "distribution or sale," in accordance with the provisions of section 67 of the act of 1895. The fact that the Superintendent of Documents is the agent of the Public Printer in storing and mailing the departmental stock has no bearing

on the question, except that the Superintendent of Documents, acting alone, can not take over the departmental stock; this transfer must be the action of the Public Printer, as the publications are in his custody. In the subsequent distribution the Superintendent of Documents has plenary authority by law. The fact that administratively he is the subordinate of the Public Printer and presumably acts under his direction has no bearing on the question.

The act of 1912 provides that the Public Printer shall furnish copies "only in accordance with the provisions of law or the instructions of the head of the department or establishment issuing the publication." This evidently indicates that whatever control the departments had was to be continued, and when that control expired the general provisions of law should be followed.

The failure of the departments to operate in accordance with section 67 of the printing act of 1895 does not repeal it in any way or prevent its enforcement at this time, which is recommended by the committee. The following regulation is suggested to be signed either by the Public Printer or possibly by the Director of the Bureau of the Budget:

PROPOSED REGULATION

The departments, bureaus, and offices of the Government must withdraw copies of such publications as may be required for official use that have been stored in the Government Printing Office for one year. The remaining copies will be transferred to the Superintendent of Documents for distribution or sale, as provided for in section 67 of the printing act of 1895. Whenever the number of copies requested for official use appears excessive, the number actually to be turned over will be determined by a board of review to be named by the Bureau of the Budget.

Publications such as Farmers' Bulletins, some of those of the Children's Bureau, and those where reprints are continually ordered would have the time of distribution extended, as the date for calculating the year would be advanced when additional copies were printed.

Realizing that some of the departments might attempt to withdraw their active stocks under the authority granted for retaining copies for their official use, it seemed advisable to create an outside agency for reviewing requisitions that seemed excessive, and possibly made for the purpose of evading the law. No doubt some of the departments will register objections to surrendering their stocks of publications on the ground that the functions of their offices will be handicapped. Where it has been their practice to use publications as a means of reducing correspondence by sending marked copies, it seems to the committee that reference could be made to the publication, quoting sales price, if copies were no longer available for free distribution. In cases where the departments fail to retain a sufficient number of copies for official use, the law will permit turning back copies taken over by the Superintendent of Documents so long as copies received from the departments are available in stock.

MAIL LIST SECTION

The stenciled mailing lists on June 30, 1927, had reached a total of 1,339 separate lists, an increase of 119 during the year, and the number of names on these lists had increased from 848,396 to 900,000.

New lists received from the Department of Agriculture accounted for most of the increase, as they added 91 within the year.

More departments have adopted the practice of sending out announcement cards for new publications, so that the recipient may select the publications if of interest to him. This is far better than the old plan of sending out the publications without affording an opportunity for selection. The change in policy, coupled with the card work involved in the revision of the mailing lists, required the making of 800,000 impressions from the stencils last year, which was in addition to the 23,166,824 impressions made on envelopes, labels, and wrappers used in mailing publications.

Six new publications were placed on a subscription basis last year, which now makes a total of 64. The greatest difficulty experienced in subscription work is the congestion which occurs at various periods of the year as a result of the large number of subscriptions expiring at the same time. There seems to be no practical way of preventing this congestion. During the month of June 30,000 expiration notices were sent out, largely on account of the monthly supplement to the Postal Guide.

PUBLICATIONS ISSUED BY THE OFFICE

Index to Monthly Catalogue, July, 1925, to June, 1926 (196 octavo pages).

Twelve numbers of Monthly Catalogue, July, 1926, to June, 1927 (totaling 969 octavo pages).

Twenty-eighth Preliminary Schedule of Volumes, Reports and Documents of the Sixty-ninth Congress, first session, December 7, 1925, to November 10, 1926, and special session of the Senate, March 4 to 18, 1925 (7 octavo pages).

Document Index No. 36, Sixty-ninth Congress, first session, December 7, 1925, to November 10, 1926, and special session of the Senate, March 4 to 18, 1925 (380 octavo pages).

Fifty price lists and three leaflets.

The Document Index, No. 36, Sixty-ninth Congress, first session, December 7, 1925, to November 10, 1926, listed above, is the largest Document Index issued since No. 18, Sixty-second Congress, first and second sessions, 1911-12. No. 36 indexes 3,438 documents, divided as follows: 1,189 Senate reports; 1,607 House reports; 161 Senate documents; 481 House documents.

The Document Catalogue of the Sixty-sixth Congress, July 1, 1919, to June 30, 1921, is in course of preparation, and it is hoped to have it ready for printing at an early date in the new year.

DEPOSITORY LIBRARIES

The last annual report of the Public Printer called attention to the lack of flexibility of the present depository law to meet changing conditions, because it was based upon an arbitrary designation of libraries on geographic lines. Certain suggestions were made which were incorporated in Senate bill 4973, Sixty-ninth Congress, second session, introduced by Senator Johnson, of California. This bill, which failed to pass, provided that the designations should be made jointly by the Superintendent of Documents and the Librarian of

Congress. Doctor Putnam, however, believes the bill should be changed so that the Librarian of Congress would act only in an advisory capacity. His argument for such change is that the Librarian of Congress has fewer channels of information open to him than those that are available to the Superintendent of Documents.

A copy of Senator Johnson's bill was sent to about 75 of the prominent libraries and their replies indicated that they were unanimous in their approval of the legislation.

The question of change in the law was discussed at the Toronto conference, June 20 to 25, 1927, of the American Library Association, and the following resolution was passed June 24, by the council of the American Library Association:

Whereas the distribution of public documents by the United States Government has always been a subject of vital interest to librarians and therewith, also, the allotment of designated depository libraries; and

Whereas Senator Johnson, of California, introduced into the United States Senate in the second session of the Sixty-ninth Congress Senate bill No. 4973, which would provide for a more equitable designation of depository libraries throughout the States, and from which should result a wider and fairer distribution of the publications of the National Government; Therefore be it

Resolved by the Council of the American Library Association, That the approval of the association be given to the project of securing by proper legal action a more just and equitable designation of depository libraries in the United States; and that the proper committees of the association are hereby authorized to take appropriate action to accomplish this result.

MIMEOGRAPHED AND MULTIGRAPHED MATERIAL

During the past year the documents office has been conducting a study and investigation of the material issued by mimeographed, multigraphed, or other duplicating processes, as to the amount and character, the first object being to determine what to keep, how much is of such permanent value as to justify filing and entering in the library and catalogues; also the care, treatment, and annotation for that only temporary in character. After taking into account the material being received by the library, the following report was submitted:

The executive departments, the bureaus thereunder, and the various independent Government offices have for some time past put out considerable material mimeographed, multigraphed, and done by other processes of "near printing." This material is not all ephemeral as press notices, office memoranda, etc., but embraces well-defined series, periodicals, and reports, which are of permanent value and would seem of sufficient importance to warrant printing. Some series which have been mimeographed for some time and later printed are as follows:

Weekly News Letter, issued by the Department of Agriculture, volume 1, Nos. 1 and 2, mimeographed; volume 1, No. 3, to volume 9, complete, printed.

Forest Worker, issued by Forest Service, September, 1924, to November, 1926, mimeographed; January, 1927, to date, printed.

Agricultural Situation, issued by the Agricultural Economics Bureau, volumes 1 to 10 mimeographed; beginning with volume 11 (current volume), printed.

Technical News, issued by Bureau of Standards, Nos. 1 to 96, mimeographed; No. 97 to date, printed.

Reading Courses, issued by Bureau of Education, Nos. 1 and 2, mimeographed; Nos. 3 to 30 and later edition of 1 and 2, printed.

Venereal Disease Information, issued by Public Health Service, volumes 1 to 4, No. 4, mimeographed; volume 4, No. 5, to date, printed.

This material is a serious problem to those receiving it from the various offices, especially the libraries, and the question is what shall be kept and what discarded. The public documents library keeps well-defined series and periodicals and reports of value, but does not by any means receive all valuable material, nor is there any sure way of checking up. Material is discarded which seems to be of only temporary value, such as press notices, advanced information later to be incorporated in permanent reports.

The recommendation that the public documents library receive all mimeographed material having been approved, the following letter, dated April 25, 1927, was sent to all officers of the Government establishments:

To Officers of the Government Establishments:

For recording in the official catalogues and indexes of the Federal Government section 62 of the act of January, 1895 (28 Stat. L. p. 611), provides that the head of each of the executive departments, bureaus, and offices of the Government shall deliver to the Superintendent of Documents a copy of each and every document issued or published by such department, bureau, or office not confidential in its character.

Under the authority granted by this act it is requested that copies of all such publications, whether printed from type, mimeographed, multigraphed, or produced by any other duplicating process, be supplied regularly and promptly to the Superintendent of Documents. In all cases address to the Library, Office of Superintendent of Documents, Government Printing Office, Washington, D. C.

Your compliance with the above request is necessary in order that the Government catalogues and indexes may properly record this valuable information.

In reply to this letter quantities of mimeographed and multigraphed material have been received. Most of it was deemed advisable to keep in the library, even if not entered in the Monthly Catalogue, and it will probably be entered in the Document Catalogue. The well-defined series are classified and treated in the library as any other series, and most of this material consists of periodicals or continuations. Miscellaneous material are assigned to classes at the end of the issuing office designated as "Z" classes; that is, capital "Z" after the period and before the colon. These classes are modified after the "Z" if more than one, book numbers being assigned in the same manner as for the regular classes of printed publications.

Librarians have been greatly surprised at the value of much of this material—so good that it ought to be printed. Some valuable material is preliminary in character, subject to revision, and later to be incorporated into permanent reports, but it serves its purpose, namely, to advise the public relative to conditions both at home and abroad. This holds good especially for statistical reports put out by the Census Bureau and the Bureau of Foreign and Domestic Commerce. It is recommended that this preliminary material be not entered in a permanent form, but held for a time until the final report has been received.

It is hoped shortly to submit a plan listing such material to be held in the public documents library, also what to be discarded at once and what to be retained for a time, to be determined by the character, purpose to be served, and frequency of issue. To care for this material so that it serves its purpose involves additional work, but as soon as it is systematized we hope to keep it up to date. Until then a final report as to its usefulness to the office can not be made.

Following are a few examples of miscellaneous mimeographed publications, which will give an idea of some of the subjects treated:

Bureau of Agricultural Economics:

Marketing Western New York Peaches, Season 1926; by R. L. Sutton and A. L. Thomas.

Agricultural Situation in Austria; by Louis G. Michael. 1923.

Cattle Situation in Argentina; by George B. L. Arner.

Character of Farm Prices of Farm Products and Wholesale Prices of Non-agricultural Commodities; by months, 1910-1926. June, 1927.

The July, 1927, Hog Outlook.

Development of Cooperative Cotton Gins in Northern Texas, A Preliminary Report. June, 1927.

Beginnings of Cooperative Dairy Organizations. A Preliminary Report. June, 1927.

Cooperative Marketing of Wool, 1920-1926. June, 1927.

NOTE.—This bureau does not maintain a mailing list for its mimeographed material, but it is listed in State and Federal Marketing Activities, a weekly mimeographed periodical issued by the bureau, making it possible to note and, if desirable, apply for copies.

Federal Board for Vocational Education:

Personality and Leadership in Prospective Home Economics Teachers. February, 1926.

Report of Western Regional Conference on Civilian Vocational Rehabilitation, Salt Lake City, Utah. January 25, 26, 27, 1927.

Overcoming Prejudices Against the Employment of the Physically Disabled. November 1, 1926.

Organized Cooperation in Civilian Rehabilitation, Michigan, Minnesota, Wisconsin. July 1, 1926.

Tenth Annual Southern Region Conference, Agriculture, San Antonio, Tex. March 28 to April 2, 1927.

Vocational Education for Those Engaged in the Retail Meat Business; Conference Topics on Pricing Fresh Meat.

NOTE.—These are designated as Misc. (number). They are on various subjects having to do with the work of the board in preparing the veterans of the World War to earn a living along lines best suited to the individual. Of especial interest are the reports of different region conferences held in different parts of our country along different vocational lines. We regret that we have not the earlier reports and it is doubtful if they can be secured now. Those we have came in reply to the letter of April 25, 1927.

Tariff Commission:

Bentwood Chairs, Cost of Production.

Fluorspar, Cost of Production.

Maple Sugar and Maple Sirup, Cost of Production.

NOTE.—The above titles have been issued as preliminary statements, pursuant to provisions of section 315, Title III, of the tariff act of 1922.

At the 1927 conference of the American Library Association, in Toronto, Canada, the librarians of business libraries stressed the value of mimeographed material to their patrons. Being received much more promptly than possible were it printed, it gives out advance information, statistics, and statements showing the trend of manufactures, markets both at home and abroad, production of food-stuffs, livestock, growth of cities, etc. To a business man or firm material affecting his business is of vital importance, and the library that can serve him is a labor saver as well as a source of information.

The issuing establishments of the Government ought to adopt a color scheme, using the same color for all press notices, another for material prepared to answer correspondence, short statements to be inclosed in official letters and form letters, another for preliminary statements to be later incorporated in reports; in fact, using as many colors as the character of the advanced information put out by an

individual office warrants. This would make the sorting much easier, being able to determine at a glance where to place it. Permanent material should be on white paper.

To the Public Printer we would suggest that a campaign be carried on with the issuing offices to the end that material of permanent value will be printed. In time, mimeographed publications deteriorate, the paper being poor and the printing not distinct. We recommend that the public documents library receive all mimeographed material, discarding the undesirable, noting the title, and indicating that it was not kept in the library; other material to be discarded from time to time, listed as briefly as possible, noting how long to hold before discarding. Material of a permanent value from our standpoint should be retained and entered as real publications, whether classified in a "Z" class or as a series in the regular classification. Some series are partly printed and partly mimeographed. In the past it has been advisable to assign a class to such publications, even if only one be printed out of a number, hoping that in the future all would be printed. In such cases the printed ones are entered in the Monthly Catalogue with a note to the effect that the mimeographed ones are not entered in the catalogue.

CONCLUSIONS AND RECOMMENDATIONS

The study now being made will no doubt result in improved service, but the real reason for delay in handling orders is that the business of the documents office has outgrown the present force. The cash orders received last year totaled 417,543, which was 42,628 more than for the previous year, or an increase of over 11 per cent. The inevitable result of such an increase is need for additional employees for all sections of the office, who have been provided for in our estimates for the next year's appropriation.

The business of the office having passed the half-million mark, there should be a separation in the work now supervised by the cashier, so as to confine his duties to the receipt and disbursement of cash. This would make necessary the creating of a bookkeeping section to handle all book records, ledger accounts, and auditing and analysis of cash mail. At the present time clerks connected with the cashier and bookkeeping section are used in the opening of the mail, to the detriment of their own work, which practice should be changed by providing a separate group of employees to handle exclusively the opening of the mail.

Another recommendation is that a section be created to have charge of the ordering of all publications for sale and the examination of stock for the purpose of eliminating excess and obsolete publications. There is no question as to the need of such a section, and its activities directed along the proper lines would result in improved service.

Respectfully submitted.

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