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THIRTEENTH ANNUAL REPORT

OF THE

SECRETARY OF COMMERCE

1925



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[November 2, 1925]

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THIRTEENTH ANNUAL REPORT
OF THE
SECRETARY OF COMMERCE

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, November 2, 1925.

To the PRESIDENT:

I have the honor to submit herewith for transmission to Congress the Thirteenth Annual Report of the Secretary of Commerce, in four parts, as follows:

- I. Progress in the elimination of industrial waste.
- II. Economic review.
- III. Legislative recommendations.
- IV. Condensed reports of bureaus.

The Patent Office was transferred by Executive order from the Department of the Interior to the Department of Commerce on April 1, 1925, and a brief review of its activities is incorporated in this report. The Bureau of Mines was similarly transferred from the Department of the Interior to the Department of Commerce on July 1, 1925. As that was the first day of the new fiscal year, the report of the bureau for the year under review will be made through the Secretary of the Interior.

Yours faithfully,

HERBERT HOOVER,
Secretary of Commerce.

Part I.—PROGRESS IN ELIMINATION OF WASTE

[By HERBERT HOOVER, Secretary of Commerce]

Great progress has been made during the year in the national movement for elimination of industrial waste. The Department of Commerce, in continuation of its work of the past five years, has devoted much of its activities to this end.

While various divisions of the department have been actively aiding in the campaign in many specific directions, it must be borne in mind that the whole program is one fundamentally to stimulate action among industries, trades, and consumers themselves. It is obviously not the function of Government to manage business, but to investigate economic questions, to survey economic phenomena and point out the remedy for economic failure or the road to progress, to inspire and assist cooperative action, and to stimulate forces to these ends—surely all these are well within the proper field of public service.

It seems worth while at all times to reiterate the fundamental purposes of this campaign. The philosophy that underlies it has but one purpose; that is, to maintain American standards of living for both workers and farmers, and to place production on a more stable footing. The high standards of living enjoyed by the American people are the result of steadily mounting per capita productivity. There is only one way to further advance these standards, and that is by improved methods and processes, by the elimination of waste in materials and motion in our production and distribution system. Just as 20 years ago we undertook nation-wide conservation of our natural resources, so we must to-day even more vigorously sustain this campaign of better nation-wide utilization of our industrial resources and effort. More especially is this the case in view of the many complex forces which have arisen from the war, and particularly the difficulty of maintaining our situation as against the competition of a world of lower standards overseas.

The term "elimination of waste" is subject to some objection as carrying the implication of individual or willful waste. In the sense used in these discussions elimination of waste refers wholly to those wastes which can be eliminated solely by cooperative action in the community. They do not refer to any single producer, for in the matters here discussed he is individually helpless to effect them. Nor do they imply any lessening of fair competition or any infringement of the restraint of trade laws. In fact, the most casual in-

vestigation of the work in progress will show that its accomplishment establishes more healthy competition. It protects and preserves the smaller units in the business world. Its results are an asset alike to worker, farmer, consumer, and business man.

It may be worth while repeating the major directions of this effort as they were outlined by the department at the beginning of this undertaking four years ago.

1. Elimination of waste in railway transportation by the provision of adequate facilities and better methods.

2. Vigorous improvement of our natural interior water channels for cheaper transportation of bulk commodities.

3. Enlarged electrification of the country for the saving in fuel, effort, and labor.

4. Reduction of the periodic waves of unemployment due to the booms and slumps of the "business cycle."

5. Improved statistical service as to the production, distribution, stocks, and prices of commodities, both domestic and foreign, as a contribution to the elimination of hazard in business and therefore of wasteful speculation.

6. Reduction of seasonal employment in construction and other industries, and intermittent employment in such industries as bituminous coal.

7. Reduction of waste in manufacture and distribution through the establishment of grades, standards of quality, dimensions and performance in nonstyle articles of commerce; through the simplification in dimensions of many articles of manufacture, and the reduction of unnecessary varieties; through more uniform business documents such as specifications, bills of lading, warehouse receipts, etc.

8. Development of scientific industrial and economic research as the foundation of genuine labor-saving devices, better processes, and sounder methods.

9. Development of cooperative marketing and better terminal facilities in agricultural products in order to reduce the waste in agricultural distribution.

10. Stimulation of commercial arbitration in order to eliminate the wastes of litigation.

11. Reduction of the waste arising from industrial strife between employers and employees.

What the country as a whole has accomplished during the past five years in increased national efficiency in these directions is impossible of measurement. Nor does the Department of Commerce lay claim to credit for the great progress that has been made, save as we may have helped to organize a definite public movement. That

movement is the result of a realization by every group—business men, industrial leaders, engineers, and workers—of the fundamental importance of this business of waste elimination. In addition to elimination of waste we have had the benefit of notable advances in science, improvement in methods of management, and prohibition.

Thanks to elimination of waste and these other contributing factors, we can as a Nation show one of the most astonishing transformations in economic history, the epitome of which lies in the following table from the Department of Labor:

MOVEMENT OF WAGES AND PRICES, 1920-1924

[1913=100]

Year	Wage rates	Prices ¹
1920.....	199	226
1921.....	205	147
1922.....	193	149
1923.....	211	154
1924.....	228	150

¹ Average wholesale prices of all commodities.

While wages are higher than in 1920, wholesale prices are lower. We have thus the highest real wage in our history, and we have had three years of remarkable price stability, which has reduced speculation in commodities to a minimum. We can hold that stability if we avoid speculation.

A comparison with similar British indexes gives striking evidence that these results are peculiar to the United States.

INDEX NUMBERS OF WAGES AND PRICES, GREAT BRITAIN, 1920-1924

[1913=100]

Year	Wage rates	Prices ¹
1920.....	230	283
1921.....	260	181
1922.....	200	159
1923.....	170	162
1924.....	170	174

¹ Average wholesale prices of all commodities.

The activity of the Department of Commerce in this field of waste elimination is indicated by the fact that since the work was launched on a large scale in 1921 some 900 group conferences have been held, practically all at the request of the industries themselves, and 229 committees are now at work on various phases of the program.

Some idea of the progress that is being made on a national scale may be gleaned from the following condensed statements by department officials in touch with different fields of activity:

ELIMINATION OF WASTE IN RAILWAY TRANSPORTATION

[By EUGENE S. GREGG, Chief, Transportation Division]

One of the most important contributions to the elimination of national waste has been the remarkable improvement in railway transportation during the past five years.

The first factor in that improvement was the provision of adequate transportation itself. The periodic car shortages of many years past have practically disappeared, although the tonnage loaded has increased more than 25 per cent since 1921. The waste imposed on carriers and public in those periods of shortages in transportation was far larger than is commonly supposed. The derangement of production and employment in all industries, the widening of prices between producer and consumer, due to repeated strictures in transport which created glut in supply and scarcity in consumption, amounted to hundreds of millions annually.

Some very important economic effects have resulted from full, prompt, and reliable delivery of goods. The necessity for carrying large stocks as a protection against transportation failure has largely disappeared, and in consequence the capital required in the Nation's distribution has been considerably reduced. Scarcely a single retail house is to-day carrying as large stocks in proportion to turnover as formerly. While one effect has been to burden the manufacturer with "short orders," nevertheless the change has been highly beneficial, for it has greatly lessened the likelihood and danger of price fluctuations.

A second improvement, aside from direct increase in facilities, has been the very great and fundamental increase in efficiency of operation. Since 1921 the average weekly car loadings have increased from 693,533 to 986,475, the number of miles per car per day from 22.4 to 26.9, the average trainload from 656 to 731 tons. The traffic is being carried with relatively less employees, the ton-miles handled per employee being 221,203 in 1924 as against 182,477 in 1921. This fine accomplishment of the railway managers has been distinctly aided by the large measures of cooperation with shippers established by the railways through effective regional committees.

There have been many other savings in transportation during the past few years in addition to those accomplished in the operation of the carriers. Better packing has been an important factor in the 48 per cent decrease in railroad claims between 1921 and 1924, a decrease of from approximately 92 to 48 million dollars. Standard-

ization of the forms used in associated industries of transportation has also had its effect in reducing the distribution costs. Special studies have been made by the department during the past year in the handling of certain classes of freight. The working out of the suggestions arrived at by these special studies has been a contributing factor to the lessening of terminal delay in loading and unloading freight, and to the more rapid movement of carload and less-than-carload merchandise.

There are many problems yet to be solved in transportation, notably the coordination of railway and water facilities and the working out of the economic relation between motor truck and less-than-carload railway distribution. Further study in domestic packing and efficiency in terminal loading and unloading of railway cars will bring good results. Our terminal facilities for handling perishables (not wholly a railway question) must be greatly improved. The astonishing growth in consumption of fruit and vegetables has created difficulties in terminal distribution which very greatly increase distribution costs and create great wastes in these commodities through deterioration. The cost at the terminal markets between the door of the car and the door of the retail store often exceeds the entire freight.

IMPROVEMENT OF OUR INLAND WATERWAYS

[By PAUL S. CLAPP, Special Assistant]

The Department of Commerce has given continued attention to the vigorous improvement of our inland waterways for cheaper transportation of bulk commodities; also, to the fuller utilization of the water resources of our rivers for all purposes—navigation, irrigation, and power—and has pointed out the benefits of storage in enhancement of these values and in overcoming danger from floods. All these improvements lead to eliminations of waste in fuel and labor, reduced transportation costs, and increased national efficiency.

MISSISSIPPI RIVER SYSTEM

Shifts of profound importance in the relative advantages of different parts of the country with respect to transportation have resulted from the war. The necessary advances in rail rates from the Mississippi Valley States to the Atlantic seaboard have distorted economic relationship of that area to the rest of the country and the world. Because ocean rates are practically upon a pre-war basis, the opening of the Panama Canal has given the eastern seaboard competitive advantages over the Mississippi Valley in the supply of manufactured goods and agricultural products moving

between the Atlantic and Pacific seaboard. These distortions are one of the fundamental difficulties of the great agricultural heart of the United States lying between the Appalachian and Rocky Mountains.

In consequence of this, it is of the utmost importance that we accomplish the earliest possible completion of the Mississippi system of waterways in order that cheaper water-borne traffic in primary and bulk goods within this great mid-west area and in its egress to the sea may contribute to restore its economic relationships to the rest of the country. This can be accomplished without harm to our great railway systems, the growth of whose traffic with increasing population will in any event tax their powers.

The formulation of a comprehensive plan urging rapid development of the Mississippi Valley streams into a completed system of trunk and lateral waterways was made by Secretary Hoover in an address at Kansas City, in October, 1925.

GREAT LAKES TO THE OCEAN

Some progress has been made toward the ultimate foundation of the project to open a route between the Great Lakes and the ocean, thus enabling deep-sea vessels to penetrate the interior of the country, with great advantages to our farmers, our manufacturers, and particularly the whole of the people in the 18 States adjacent to the Lakes.

Negotiations were initiated with Canada in 1922, at the request of Secretary Hoover, for a consideration of the improvement of the St. Lawrence River from Lake Ontario to Montreal, providing not only canalization for deep-sea navigation to the Lakes, but the development of large quantities of electrical power. National commissions were created in both Canada and this country. The St. Lawrence Commission of the United States, under the chairmanship of Secretary Hoover, comprises Charles L. Allen, William C. Breed, Charles P. Craig, James F. Davidson, Stephen B. Davis, James P. Goodrich, James R. Howard, and James P. Noonan. This commission has held several meetings during the year. A joint engineering board, under an appropriation by the last Congress of \$275,000, also an appropriation by Canada, is actively at work on the engineering aspects and will report early next year. Concurrent with this, the Department of Commerce has in process a critical economic study of the effects and benefits of this great project. The results of these studies, with the reports of the engineers, will be reviewed by the commission, and its final recommendations prepared for the consideration of the country.

Arising out of these studies, Congress has also appropriated a sum of money for the study of an alternative route from the Great Lakes across New York State.

Irrespective of the route selected, there is urgent need of both Canada and ourselves for the regulation of the levels of the Lakes by works at the foot of Lake Erie, thereby providing greater depths for navigation, the lowered levels of which (in the main due to climatic conditions) have imposed great wastes upon Lake shipping.

GREAT VALLEY OF CALIFORNIA

Studies by the Department of Commerce into fuller utilization of water resources for irrigation, power, navigation, and flood control have been made in connection with the rivers of the Great Valley of California, involving the Sacramento and San Joaquin Rivers. The need of better organization toward the full development of these streams, for their coordinate use by all interests, was summarized in an address by Secretary Hoover in Sacramento, Calif., in June, 1925.

COLORADO RIVER

The development of this great water resource having been retarded for years by the interstate conflict over water rights, a commission was created, representing the seven States involved, under the chairmanship of the Secretary of Commerce for the purpose of reaching an agreement in the matter. The Colorado River compact settling these interstate rights was signed at Santa Fe, N. Mex., November 24, 1922. The compact has not yet been ratified by all of the States involved, and in consequence the development of the river continues to be held up.

ELIMINATION OF WASTE THROUGH ENLARGED ELECTRIFICATION

[By PAUL S. CLAPP, Special Assistant]

During the past five years there has been a notable advance in the electrification of the country and in the generation and distribution of power. This is being accomplished not only with an enormous saving in fuel but with large increases in productivity, reduction of physical effort and labor, and added comfort in the home. Since 1920 long strides forward have been taken in the development of widespread electrical power systems, which are increasingly becoming the enormous reservoirs of mobile and reliable power for all purposes, upon which in such large measure our national progress depends.

The advent of long-distance transmission and its sequence, the production of power upon a large scale in more economical plants at most advantageous points, is having a far-reaching influence.

Our electrical generating capacity increased from 14,280,000 kilowatts in 1920 to over 23,000,000 kilowatts in 1925, an increase of 60 per cent. This has been effected principally in large efficient units concentrated in carefully operated central plants, with gradual elimination of wasteful smaller plants. At the same time the development of water powers connected to electrical systems has been particularly active. Of the total of 8,300,000 horsepower now developed and connected to these systems, 2,500,000 horsepower, or 30 per cent, has been set to work in this period.

Interconnection of power plants, hydro and steam, has rapidly progressed, enabling maximum utilization of each with large economies in power production and distribution. Factory steam plants are being replaced with electrical power, the increased industrial load during the day being supplied from the same equipment as the night load of cities. The capital invested in idle or underloaded equipment has been effectively reduced. Water powers formerly too far removed from the market are now being developed and put to work. The steadily increasing base load upon large economical central plants and the shift from small electrical or industrial plants has resulted in great savings in fuel. The consumption of coal or its equivalent by electrical plants has been decreased from 3.2 pounds per kilowatt-hour as the average required in 1919 to 2.2 pounds in 1924, a total saving in this period of over 50,000,000 tons. To this can be added the saving of some 6,000,000 tons from the water power put into operation, making a total of 56,000,000 tons saved.

The cost of power has been maintained at pre-war levels, the large economies in production and distribution offsetting the rise in labor and material costs.

In industry, there have been large increases in the power applied, and in the shift toward electrification, the source of supply increasingly becoming the interconnected systems. In 1919, 55 per cent of the total primary power in factories was applied electrically; this has increased to 70 per cent. Between 1919 and 1923, power used in industry increased from 29,300,000 to 33,000,000 horsepower; local installations of boilers and engines remained stationary, the total increase being in electrical drive. This enormous and effective application of power by our workmen has increased his productivity beyond any other country; it has enabled us to maintain wage levels and to reduce the burden of human toil.

The interconnected electrical systems now stand ready to furnish the necessary power supplies for electrification of transportation, the accomplishment of which will increase carrying capacity of present channels, give added comfort in travel, and further reduce consumption of fuel. Terminal electrification has already given

great relief from congestion at terminals and added much to property values.

The number of homes wired for electrical service has increased from 5,700,000 in 1920 to over 12,000,000, greatly extending the advantages of electricity, relieving home makers of many irksome tasks, and adding immeasurably to home comfort. The adaptation of electric power to the farm is rapidly expanding and is being given increasing attention.

STATISTICS AS A FORCE IN THE ELIMINATION OF WASTE

[By W. M. STEUART, Director of the Census]

There has been a great extension and improvement in business statistics during the past five years. A distinctly new attitude and basis of thought upon the question of the enormous waste due to periodic suspension of production and employment was developed through the exhaustive research by the committee on unemployment and the business cycle, appointed by the Secretary of Commerce in 1922, and comprising Owen D. Young (chairman), Joseph H. Defrees, Mary Van Kleek, Matthew Woll, Clarence M. Wooley, and Edward Eyre Hunt (secretary).

This committee's report pointed out that depressions and slumps were the reaction from the waste, extravagance, and overproduction during booms, and that the reduction of boom periods was the point for attack. In this field the committee suggested that the most important contribution to solution lay in a better understanding by the business world of the dangers inherent in these boom periods, and of the signals of their approach. This very understanding, it was felt, would bring automatic reaction in the business community which would largely cure the evil.

In this direction the committee strongly supported the views of the department that an adequate objective statistical service as to production, consumption, stocks, and prices of commodities, together with informational service upon economic currents at home and abroad, was the first requisite. They also pointed out the desirability of direct check upon overspeculation through credit management by the Federal Reserve Board, and also the importance of a reserve of construction and equipment in the large industries and in governmental and public works which could be used to stimulate activity at any indication of slackening employment. Aside from their contribution to stabilization of the business cycle, statistics and economic information have a profound day-to-day importance in the elimination of waste in all of our industry and commerce.

With the purpose of putting statistics to work, the department, through the Bureau of the Census, inaugurated the monthly Survey of Current Business in 1921, and has been building up that publication ever since, with the aim of collecting all this type of information and making it promptly available to the business community. At the same time the census of manufactures was reorganized to point it more directly to these purposes. The department has also developed a large informational service through Commerce Reports, issued weekly, and the Commerce Yearbook, issued annually, together with numerous special reports of particular interest to different industries and trades. These services reflect the concentration of the vast collection of data from individual industries and trades, a considerable part of which has been recruited by the trades themselves.

It has long been the view of the department that the function of the Federal Government should be to provide, through the Bureau of the Census and other branches, the basic data as to population, occupation, production, etc., in order that accurate foundations should be periodically created upon which intermediate current statistics and surveys might be conducted by the industries and trades, and further that the Government could render a valuable service by summarizing the results of current trade statistics so that they should be available to members of other trades and to the public.

There has been hesitation in many trades at undertaking this large area of effort because of the lack of clarity in interpretation of the Sherman Act. These matters were clarified, however, by decisions which the Supreme Court handed down June 11, 1925, in the maple flooring and cement cases. These decisions supported the economic necessity of accurate statistical surveys, recognized their contribution to the public welfare, and held that in themselves such statistics constituted no infringement of the law. These decisions in no way relax the restrictions upon conspiracy to control price and distribution.

The importance of statistics as a contribution to the elimination of waste can be shortly summarized. Information as to the distribution of population, its character, and occupation, and as to industrial capacity, production, stocks, and distribution, is vital to economy in the distribution trades and to judgment on increase in plant capacity and production. The whole system of production and distribution is improved just in the degree that supply and demand can be rightly adjusted. Underproduction creates scarcity and speculation; overproduction creates losses, suspension of industry, and unemployment. Both violently affect price and widen

the margin in distribution. Industry is no longer local in its production and distribution, and the fundamental facts must be determined for the country as a whole and often for the whole world. Therefore knowledge as to productive capacity, volume of production, stocks, commodities, and current consumption of every industry is vital if we are to have stable industry and stable profits without undue margins and speculation. Public information as to these things is necessary to safeguard both the consumer and producer.

Agriculture shares these benefits with all other industries. In fact, no industry so much requires the compilation of such statistics as does agriculture, for the many million units of production are less able to adjudge these currents than the larger units of other industry with their larger contacts.

ELIMINATION OF WASTE IN PROCESSES

[By GEORGE K. BURGESS, Director, Bureau of Standards]

In cooperation with the industries of the country the Bureau of Standards is assisting in the great problem of eliminating wastes, which like all major problems depends for its solution upon more fundamental, scientific, and technical data. As a result of the equipment built up during the war the bureau to-day possesses the greatest physics and research laboratory in the world. While the pre-war activities of the bureau were mainly directed at the determination of physical standards and constants, it seemed desirable that our industrial system should not lose the great values that could be obtained from the wider use of these laboratories in research into the elimination of waste in industrial processes, where such research did not conflict with that carried on by the industries themselves. More particularly does this apply to industries comprised of great numbers of small manufacturers, none of whom can afford to establish the laboratory and research staff necessary for consideration of broad problems.

There has, therefore, been developed a large amount of research work of this character in cooperation with committees of the different industries, and this work is steadily expanding. Through these researches ways and means have been found for the better utilization of our raw materials, for cheapening and improving the quality of manufactured articles, and for turning to useful purposes by-products of industrial plants. Recent progress in this field of waste elimination may be illustrated by the experiments in chrome tanning for shoe soles, which increases the time of wear; the studies of crazing of pottery, which cuts down seconds; and the demonstration of the practicability of the commercial production of levulose, which may result in a new American industry.

Various industries have cooperated with the bureau in research designed to effect large savings in manufacturing, and especially by stationing at the bureau research associates working on fundamental problems. These research associates now number 63, as against 29 last year. For example, the Portland Cement Association has 8 men here working on a joint program of far-reaching importance in the development of our knowledge of what has in recent years become one of our most widely used materials of construction.

ELIMINATION OF WASTE IN THE CONSTRUCTION INDUSTRIES

[By GEORGE K. BURGESS, Director, Bureau of Standards; JOHN M. GRIES, Chief, Division of Building and Housing; RAY M. HUDSON, Chief, Division of Simplified Practice; and AXEL H. OXHOLM, Chief, Lumber Division]

Construction ranks among the most important of all our great industries, not only because of its volume of about \$6,000,000,000 annually, but because it bears peculiar relationships to the whole economic fabric. The industries dependent upon it for the disposal of their products—lumber, steel, cement, brick, as well as transportation, etc.—are so numerous and form so large a section of our national economic structure that the ebb and flow of construction activity has a dominant effect upon the entire problem of prosperity and depression.

Theoretically, if the construction industries could concentrate their activities in times of slackening demand for consumable goods, we might stabilize our entire business fabric. Although this theoretical possibility of complete economic control is not practically feasible, much can be contributed through the stimulation of public works—Federal, State, and municipal—and of other types of building and repair work so as to strengthen employment in times when other trades are slack. The development of better statistics on construction has, furthermore, made it possible to keep the volume of construction within reasonable limits at times of peak activity in general business (as explained more fully in the section on "Statistics").

In the more immediate and measurable problem of elimination of direct waste in the industry there has been great progress. Such major wastes have arisen from:

1. The seasonal character of the industry.
2. Insufficient standards as to grades, quality, and business documentation.
3. Unnecessary or uneconomical variety in dimensions of building materials.
4. The confused state of municipal building regulations and lack of "zoning" in cities.

5. Lack of adequate statistics as to volume and character of construction, building costs, production, stocks, and consumption of building materials, etc.

6. Uneconomical purchasing methods with particular reference to specifications and true requirements of consumers.

REDUCTION IN SEASONAL CHARACTER OF THE INDUSTRY

In June, 1923, the Secretary of Commerce appointed a committee on seasonal operation in the construction industries.¹ This committee recommended an exhaustive investigation by the department into the fundamentals which underlie the seasonal character of the industry. Following the detailed study, it concluded that under the improved methods of construction and the climatic conditions of most of the country, construction could proceed as economically and effectively in winter as in summer; that an extension of the active building season would give steadier employment of men and equipment, both in construction and the material trades; and that cooperation in each locality by those concerned with construction could do much to utilize labor and transportation facilities more effectively throughout the year. Contractors, real-estate men, building-material manufacturers, labor, and other groups represented on the committee accordingly united in furthering the organization of local committees to plan and encourage better-distributed construction.

The better understanding of the problem brought about by the committee's report, and the cooperative activities in many localities, have already had a marked effect. Activity of a large number of contractors on operations throughout the country averaged about a third greater during the three winter months of 1924 than in previous years. The far-reaching practical effect of such developments has been demonstrated during the past year, when the total amount of construction reached a value of more than \$6,000,000,000, the highest in our history. Large building programs have in the past usually meant rapidly mounting costs of construction. In this case, however, there was a greater equalization of building activity throughout the 12 months, and as a result the enormous construction

¹ Ernest T. Trigg, Philadelphia, Pa., chairman, ex-president National Paint, Oil and Varnish Association; John W. Blodgett, Grand Rapids, Mich., president National Lumber Manufacturers' Association; H. R. Daniel, New York, N. Y., assistant to the president, S. W. Straus & Co.; John Donlin, Washington, D. C., president Building Trades Department, American Federation of Labor; L. F. Eppich, Denver, Colo., president National Association of Real Estate Boards; A. P. Greensfelder, St. Louis, Mo., Associated General Contractors of America; John M. Gries, Washington, D. C., chief of the division of building and housing, Department of Commerce; Jay A. House, Cleveland, Ohio, president Guardian Savings & Trust Co.; Otto T. Mallery, Philadelphia, Pa., former member of the Pennsylvania State Industrial Commission; Rudolph P. Miller, New York, N. Y., president Building Officials' Conference; James P. Noonan, Washington, D. C. president International Brotherhood of Electrical Workers; William Stanley Parker, Boston, Mass., vice president American Institute of Architects; Edward Evre Hunt, secretary.

program was executed with no marked labor shortage or serious pressure upon the building material, manufacturing, or transportation industries. The prices of most building materials, in fact, actually decreased.

ESTABLISHING STANDARDS OF GRADES AND QUALITY IN THE LUMBER INDUSTRY

Lumber is our most widely used construction material, and the gradual decrease in our forest resources demands at once better utilization. Reforestation, even if started on a large scale to-day, would not bring results for many years to come. However, the elimination of waste in the manufacture, distribution, and consumption of wood will give immediate relief.

Under the central committee on lumber standards,² appointed by the Secretary of Commerce in July, 1922, "American lumber standards" have been worked out and ratified by the three annual conferences of lumber manufacturers, dealers, and consumers called by the department. At the same time progress is being made in the grade marking of lumber. The savings in consumption of wood, through better guarantees of quality, more stable manufacture, and more economical distribution are already very large.

DOCUMENTATION

Through the committee sponsored by the Secretary of Commerce, representing contractors associations, architects, engineers, railways, public officials, and other large construction users, standard construction contract forms have been drawn up which afford better assurance to both contractor and owner, and which should eliminate much of the area of possible dispute and create a more uniform basis for competitive action.

A number of the local groups, representing all elements connected with construction, including owners and public officials, which have been formed along the general lines encouraged by the department, have instituted measures to cut down excessive expenses involved in the taking of estimates and bids from numerous contractors and subcontractors. They have also sought to eliminate the causes of disputes by efforts to define more clearly the conditions under which various groups ordinarily function, with a view to simplifying business transactions.

²The personnel of the First Central Committee on Lumber Standards, appointed July 22, 1922, was as follows: John W. Blodgett, chairman; president, National Lumber Manufacturers' Association; W. E. Hawley, American Railway Association; Dwight Hinckley, president, National-American Wholesale Lumber Dealers, secretary; John E. Lloyd, president National Retail Lumber Dealers Association; Sullivan W. Jones, American Institute of Architects and Associated General Contractors of America; John H. Kirby, president, Southern Pine Association; E. E. Parsonage, president, Association of Wood Using Industries; W. L. Saunders, National Hardwood Lumber Association.

TESTS OF BUILDING MATERIALS

Studies of the properties and use of building materials, which have been carried out by the Bureau of Standards as rapidly as funds have permitted, have proved of increasing value during the past four years of large building programs. Many of the results have been embodied in the recommendations of the building code committee. Directly and indirectly the facts learned from the tests have been used by builders throughout the country, who have been endeavoring to meet the large demands for dwellings within range of the income of the majority of the people.

SIMPLIFICATION OF DIMENSIONS

Simplification of dimensions of building materials has been carried out in a great number of branches of the industry. Committees have been appointed by the Secretary of Commerce on request of the industrial associations covering brick, steel, roofing, slate, lumber, etc., and in each case the consuming trade or the consuming public through some public agency has been represented in the deliberations and conclusions of these committees.

The major simplifications reached in this manner include the elimination of 60 per cent of varieties in softwood yard lumber and structural timbers, the establishment of one standard size of common brick in place of 44 sizes, 19 types and sizes of hollow building tile instead of 36, 11 cross-sectional sizes of reinforcing bars instead of 40, and so on through the 25 items entering directly or indirectly into building and construction.³

The benefits to the home builder, the architect, the material-supply dealer, and the manufacturer are reflected in greater ease of procurement, better service, better values, and in some instances lower prices. Considering the current high demand for building materials and their relative availability, it is obvious that simplification is expediting production, shipment, and assembling or installation, with consequent saving to all concerned.

MUNICIPAL BUILDING AND PLUMBING CODES AND ZONING ORDINANCES

In May, 1921, the Secretary of Commerce appointed a committee on building codes⁴ which made exhaustive studies of existing build-

³ Details of these simplifications are given in the table on pp. 20-22.

⁴ Ira H. Woolson, chairman, New York, N. Y., consulting engineer, National Board of Fire Underwriters; Edwin H. Brown, Minneapolis, Minn., secretary, American Institute of Architects; William K. Hatt, Lafayette, Ind., professor of civil engineering, Purdue University; Albert Kahn, Detroit, Mich., fellow, American Institute of Architects; Rudolph P. Miller, New York, N. Y., ex-superintendent of buildings; John A. Newlin, Madison, Wis., in charge section of timber mechanics, Forest Products Laboratory,

ing codes, conducted scientific tests, and got in touch with more than a thousand engineers, architects, contractors, public officials, trade association executives, and others interested in its field of work. With this broad background the committee was able to prepare a number of reports which have been accepted as authoritative and have been utilized widely in progressive revision of obsolete requirements in different cities. Adoption of the recommendations of this committee permits savings of 10 to 20 per cent in the construction of brick walls, installation of plumbing systems and other elements of small houses, compared with costs under many of the codes which have been replaced. At the same time safety is assured and sound, durable construction is encouraged. The subjects covered by the committee's reports include "Recommended minimum requirements for small dwelling construction," "Plumbing in small dwellings and similar buildings," "Masonry wall construction," and "Minimum live loads allowable in design of structures." These have been utilized in framing municipal code provisions in States as widely separated as California and Massachusetts, Louisiana and Minnesota, and Georgia and Montana.

An advisory committee on zoning⁵ was also appointed by the Secretary of Commerce in 1921 to deal with another aspect of municipal building regulations. The standard State zoning enabling act which this committee prepared has been used wholly or in part by 17 States,⁶ a fact which bears eloquent testimony to the value and far-reaching scope of the committee's work in this field. The number of zoned municipalities in the United States has increased to about 360 from a total of less than 50 at the time the committee was formed. As a result several million additional home owners have better protection for their equity in their property. The zoning ordinances

United States Department of Agriculture; Joseph R. Worcester, Boston, Mass., member, American Society of Civil Engineers; and Frank P. Cartwright, technical secretary.

Subcommittee on plumbing codes: George C. Whipple (died, Nov. 28, 1924), chairman, Cambridge, Mass., professor of sanitary engineering, Harvard University; Harry Y. Carson, Birmingham, Ala., member, American Iron and Steel Institute; William C. Groeniger, Columbus, Ohio, member, American Society of Sanitary Engineering; Thomas F. Hanley, Chicago, Ill., chairman, standardization committee, National Association of Master Plumbers; A. E. Hansen, New York, N. Y., member, American Society of Sanitary Engineering.

⁵ The members of this committee were as follows: Charles B. Ball, Chicago, Ill., secretary-treasurer, city planning division, American Society of Civil Engineers; Edward M. Bassett, New York, N. Y., counsel, zoning committee of New York; Alfred Bettman, Cincinnati, Ohio, director, national conference on city planning; Irving B. Hiett, Toledo, Ohio, ex-president, National Association of Real Estate Boards; John Ihlder, Washington, D. C., manager, civic development department, Chamber of Commerce of the United States; J. Horace McFarland, Harrisburg, Pa., ex-president, American Civic Association; Frederick Law Olmsted, Brookline, Mass., ex-president, American City Planning Institute; ex-president, American Society of Landscape Architects; and Lawrence Ceiller, New York, N. Y., secretary and director, National Housing Association.

⁶ Arizona, Colorado, Delaware, Idaho, Illinois, Iowa, Nevada, New Hampshire, New Jersey, North Carolina, North Dakota, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Utah, and Wyoming.

are helping to safeguard the houses of these families from wanton intrusion by uses of land which are best grouped apart from homes.

Reports indicate that zoning ordinances have been helpful in cities throughout the country in avoiding the blighting of districts and the unnecessary scrapping of buildings and costly public utilities that are still serviceable. The razing of a single block of dwellings and the scrapping of utility connections unsuited for altered occupancy usually involved a destruction of \$100,000 or more worth of property, depending on the number and character of houses. Where the scale of such operations is reduced by a good zoning ordinance the annual savings, even in a city of moderate size, are very considerable.

DEVELOPMENT OF CONSTRUCTION STATISTICS

The work of the department in collecting and publishing statistics relating to construction activity and building materials has been of great practical value. It has helped to make possible a change in the prevailing attitude of the industry and of building owners. In the spring of 1923, for example, when the lettings of contracts were extraordinarily large, fears were expressed that an inflationary boom might result. The department was able to point out in a public statement that the resources of the industry would undoubtedly be fully occupied for several months. The report of the committee on business cycles and unemployment, appearing shortly afterwards, gave great emphasis to the point that under such circumstances it is better for owners to wait until men and materials are available than to bid recklessly for the first place in line. As a result no real crisis developed, and the industry has continued to operate at a very high and extraordinarily even rate of activity with comparative steadiness in building costs.

HOME-OWNERS' PROBLEMS

Important progress in the science of small-house construction has been made as a result of the work of Better Homes in America. This organization for public service is supported by public contributions and is under the direction of the Secretary of Commerce as president. Other departmental officials participate in its affairs. Among the thousands of voluntary local Better Homes committees—"Better Homes Week" was observed in more than 2,000 communities last May—a large number have built, furnished, and equipped demonstration houses with the object of developing a better utilization of funds for household expenditures. The result has been to evolve conveniently arranged, attractive houses of good quality with the proportionate expenditure for different items well suited for families of average and lower incomes.

Financing the home owner of a small home is in reality one of the great problems of the construction industry, and the department has endeavored to aid the best classes of home-financing agencies through its publications. The importance of saving as a preliminary to home ownership has been emphasized in the booklet *How to Own Your Home*, of which about 300,000 copies have been sold. All these activities have contributed to a greater, steadier, and more discriminating demand for improved dwellings.

The following table shows the growth in home building:

RESIDENTIAL CONSTRUCTION CONTRACTS IN 27 NORTHEASTERN STATES

Year ended June 30—	Total residential construction contracts in millions of dollars	Ratio (per cent) of residential to total construction contracts
1920.....	874	27.8
1921.....	579	28.1
1922.....	1,199	40.1
1923.....	1,477	42.3
1924.....	1,763	47.9
1925.....	1,904	45.5

ELIMINATING WASTE BY SIMPLIFIED PRACTICE

[By RAY M. HUDSON, Chief, Division of Simplified Practice]

Simplified practice means the reduction of variety in sizes, dimensions, and immaterial difference of everyday commodities. Its purpose is to eliminate waste, decrease cost, and increase values in production, distribution, and consumption. It has nothing to do with style problems or matters of individual creation.

The method is that upon request of a given industry a survey is made of the variations and the major uses.⁷ A conference is called not only of the producers but of the distributors and consumers of this given commodity, and unnecessary sizes and grades are eliminated.

Adherence is purely voluntary, but is supported by the widespread distribution of the recommendations, and by the consistent efforts on the part of the acceptors of the recommendations to focus public attention on the advantages of buying and using the simplified lines.

⁷The department has the fine assistance of a planning committee comprising: B. H. Ackles, president, National Supply and Machinery Distributors' Association, Detroit, Mich.; W. L. Chandler, secretary, National Association of Purchasing Agents, New York, N. Y.; E. W. McCullough, manager, department of manufacture, Chamber of Commerce of the United States, Washington, D. C.; L. W. Wallace, executive secretary, American Engineering Council, Washington, D. C.; A. W. Shaw, president, A. W. Shaw Co., Chicago, Ill.; A. A. Stevenson, vice-president in charge of manufacture, Standard Steel Works Co., Philadelphia, Pa.; and Brig. Gen. H. C. Smither, Chief Coordinator, Bureau of the Budget, Washington, D. C.

The effects of simplified practice are (a) to facilitate mass production through concentration on fewer varieties, and thus decrease cost of manufacture; (b) to focus demand on specific varieties, enabling manufacturers to produce for stock in otherwise dull seasons, and thus permit more regular use of both labor and plant; and (c) to stimulate turnover of stocks, and through assured demand as well as delivery when wanted, operate on smaller stock investment.

Since this cooperative service was inaugurated over 50 simplifications have been achieved by the industries and trades concerned, resulting in an average reduction in varieties of 73 per cent. Among these eliminations of needless variety 21 apply to products of iron and steel and other metals; 8 to lumber, paper, and other products derived from wood; 17 to clay, cement, glass, and other products of a mineral nature; 4 to textiles; and 2 others to commercial documents such as warehouse receipts.

The annual value of manufactured goods affected by these simplifications runs well over \$2,000,000,000. In eight typical cases leaders in the fields covered have estimated potential savings from simplifications, as follows: Paving brick, \$1,000,000; sheet steel, \$2,400,000; steel reinforcing bars, \$4,500,000; warehouse forms, \$5,000,000; range boilers, \$5,500,000; builders' hardware, \$10,000,000; inquiry, purchase order, and invoice forms, \$15,000,000; and lumber as high as \$200,000,000.

The details of these simplifications are given in the following table:

RESULTS OF SIMPLIFIED PRACTICE, JANUARY, 1921, TO OCTOBER, 1925

Commodity fields	Number of sizes or varieties in use	Number eliminated	Number retained	Per cent reduction
IRON, STEEL, AND THEIR PRODUCTS				
Metal lath.....	125	101	24	81
Files and rasps.....	1,351	855	496	63
Woven-wire fencing.....	552	483	69	86
Woven-wire fence packages.....	2,072	1,934	138	94
Range boilers.....	130	117	13	90
Hot water storage tanks.....	120	106	14	88
Steel barrels and drums.....	68	42	24	64
Forged tools.....	665	314	351	47
Plow bolts.....	1,500	660	840	44
Steel reinforcing bars.....	40	29	11	73
Sheet steel.....	1,819	1,556	263	86
Eaves trough and conductor pipe.....	21	5	16	24
Terneplate.....	9	2	7	22
Steel lockers.....	65	48	17	74
Milling cutters.....				35
Tacks and nails, sizes.....	428	247	181	58
Tacks and nails, packing weights.....	423	302	121	71
Shovels, spades, and scoops.....	4,460	4,076	384	92

RESULTS OF SIMPLIFIED PRACTICE, JANUARY, 1921, TO OCTOBER, 1925—Continued

Commodity fields	Number of sizes or varieties in use	Number eliminated	Number retained	Per cent reduction
IRON, STEEL, AND THEIR PRODUCTS—continued				
Hospital beds:				
Lengths.....	33	32	1	97
Widths.....	34	33	1	97
Heights.....	44	43	1	98
Beds, metal.....	78	76	2	97
Bed springs.....	78	76	2	97
STONE, CLAY, GLASS, AND MINERAL PRODUCTS				
Vitrified paving brick.....	66	62	4	94
Face brick (smooth).....	37	36	1	97
Face brick (rough).....	38	37	1	98
Common brick.....	44	43	1	98
Hollow building tile.....	36	17	19	47
Roofing slate.....	98	50	48	51
Blackboard slates.....	251	226	25	90
Structural slates.....				84
Concrete building units.....	115	91	24	80
Sand-lime brick.....	14	11	3	79
Hotel chinaware.....	700	540	160	77
Cafeteria and lunch-room chinaware.....	668	491	177	73
Hospital chinaware.....	700	587	113	84
Dining-car chinaware.....	700	587	113	84
Milk bottles.....	49	40	9	82
Asphalt (grades).....	88	79	9	90
Asbestos paper.....	14	6	8	43
Asbestos millboard.....	10	5	5	50
Grinding wheels.....	715, 200	459, 400	255, 800	64
WOOD, PAPER, ETC.				
Lumber (softwood): Yard sizes and structural timbers.....				60
Paper sheet sizes:				
Stock sizes, general printing and publishing.....			4	
Stock sizes, book publishers.....			1	
Forms and letterheads.....			3	
Box board.....	244	184	60	76
Milk-bottle caps.....	29	28	1	97
Tissue paper:				
Roll tissue.....	13	10	3	77
Shoe tissue.....	21	15	6	72
Grocers' paper bags.....	6, 280	1, 580	4, 700	25
Wood beds.....	78	74	4	95
TEXTILES				
Mattresses.....	78	74	4	95
Blankets.....	78	66	12	85
Boxed elastic webbing.....	19	9	10	47
Cotton duck.....	460	366	94	80
MISCELLANEOUS				
Builders' hardware:				
Items.....				26
Finishes.....				71
Brass lavatory and sink traps.....	1, 114	1, 042	72	94
Loaded shells.....	4, 076	2, 318	1, 758	57
Paint and varnish brushes.....	480	342	138	71

RESULTS OF SIMPLIFIED PRACTICE, JANUARY, 1921, TO OCTOBER, 1925—Continued

Commodity fields	Number of sizes or varieties in use	Number eliminated	Number retained	Per cent reduction
DOCUMENTS				
Warehouse forms	Thousands		15	.....
Invoice forms	Thousands		1	.....
Inquiry forms	Thousands		1	.....
Purchase order forms	Thousands		1	.....

During the past year there has been wider recognition given to established simplifications; an increasing degree of adherence to such recommendations by manufacturers, distributors, and consumers; definite evidence of monetary savings resulting; and an increasing number of requests from industries to the division for cooperation.

Adherence to simplified practice recommendations by their original acceptors has been swelled by the adoption of the recommendations by many who were outside the original concerns represented. A recent examination shows that 1,200 trade units have indorsed 33 recommendations. These include 57 producer, 86 distributor, and 255 consumer associations. Acting independently of trade associations in their respective fields, 386 individual manufacturers, 238 distributors, and over 200 consumers have adopted and are respecting simplified practice methods which have been established.

Typical of increasing adherence is the report of the paving-brick industry which, prior to simplification in 1921, dealt in 66 varieties of paving bricks and had 80 per cent of its production in 11 of those 66 varieties. In 1924 this industry had 88 per cent in the 5 simplified varieties. Similarly the steel-barrel manufacturers in the first five months of 1925 produced 84 per cent of their 2,126,352 barrels in simplified sizes and only 16 per cent in obsolete and nonstandard sizes.

The direct savings possible through simplification are strikingly illustrated in the report of the standing committee concerned with the simplification of steel reinforcing bars, which states:

Whereas many of our warehouses were being compelled to carry some 16 to 20 different sizes we have now reduced to 11 sizes. About 600,000 tons of reinforcing bars are sold annually in the United States. Dealers under the old arrangement carried in idle stock between 150,000 and 200,000 tons. With the 11 simplified sizes it is our judgment that this business can be more efficiently handled with a stock of about 75,000 tons. In other words, the reduction in sizes to be carried means a saving in idle stock of approximately 100,000 tons, which at an average cost of about \$45 per ton means a saving in capital investment of \$4,500,000 for the industry.

The Associated Metal Lath Manufacturers, in connection with the simplification of metal lath, state:

It is safe to say that the normal quantity of eliminated styles of metal lath formerly carried in dealers' stock represented an investment of \$2,000,000 which they do not now have to carry. The space occupied by this quantity of lath, the accounting for it, the general trouble in maintaining larger than necessary stocks would also run up into hundreds of thousands of dollars in yearly savings.

Declines in prices to the consumer for many of these commodities are already in evidence.

Substantial progress has been made by the American Marine Standards Committee in the simplification of practice in the construction and equipment of ships. Some 20 standards have been agreed upon and more than 100 others are in progress of development. Over 260 varied interests in the marine and related fields are cooperating in this committee.

SPECIFICATIONS AND BUSINESS DOCUMENTATION

(By GEORGE K. BURGESS, Director, Bureau of Standards, and ADDAMS S. McALLISTER, Senior Engineer)

War experience taught us that one of the great unnecessary wastes of public funds arose from faulty specifications. Four years ago a division was established in the Bureau of Standards to develop standard specifications, and already a great deal has been accomplished in that direction. The Federal Specifications Board, an interdepartmental agency, has now covered over 300 groups of items purchased by the Government. This has required investigation into physical qualities and manufacturing practice, together with the determination of tests to be applied in inspection. Specifications in every case have been submitted to cooperating representatives of industry in order that they may be certain of their practical character. Many State and public institutional purchasing agencies are now using Federal specifications together with a considerable number of industrial buyers. This has already resulted in large economies in Government purchases.

The adoption of more uniform specifications, formulated by cooperation between producers and consumers, tends to eliminate waste by (a) more positive competitive action, (b) more reliable standards as to quality and service, (c) more uniform demands upon manufacturers, (d) increased opportunity to manufacture to stock, resulting in more regular employment of plant and labor, (e) greater economy to the consumers, and (f) greater assurance of reliability in service.

In response to a demand from private purchasing agents throughout the country, the Secretary of Commerce organized a special

advisory board of official representatives of associations vitally interested in specifications* to consider the whole question of purchase specifications as used in commerce and industry. Under the direction of this board the bureau has compiled a National Directory of Commodity Specifications containing references to 27,000 items relating to 6,600 commodities which will serve the buying agencies of the country as a guide in securing the best developed specifications.

Savings similar to those which can be effected through the simplification of specifications and the number and sizes of articles can also be obtained by reducing the number and complexity of documents needed in a business transaction. The department has aided business interests to standardize the forms of warehouse documents and receipts and is working with special committees of warehousemen, shippers, bankers, and transportation agencies to standardize the terms and conditions on such documents. If standardized terms can be agreed upon, great savings will result in the reduction of delays in carrying on business, the elimination of unnecessary trade disputes, and an increased usefulness of such documents as credit instruments.

A trend toward simplification of documents is also visible in transportation. Congress, in the transportation act, 1920, called upon the Interstate Commerce Commission to devise a uniform through export bill of lading to simplify the traffic aspects of export transactions. This movement is in line with action of the leading commercial countries in formulating uniform rules for the carriage of goods by sea. The department has aided the business community to appreciate the value of these efforts by making careful analyses of the uniform through export bill of lading and the rules for the carriage of goods by sea. The simplification of the terms and conditions surrounding a transaction promotes mutual understanding between traders and stimulates commerce.

ELIMINATION OF WASTE IN DISTRIBUTION

[By JULIUS KLEIN, Director, Bureau of Foreign and Domestic Commerce, and A. H. ONTHANK, Chief, Domestic Commerce Division]

The Department of Commerce has contributed directly to the elimination of waste in domestic distribution through its work along lines of simplification and standardization. At the same time there

* American Electric Railway Association, American Engineering Standards Committee, American Hospital Association, American Hotel Association, American Society for Testing Materials, Associated Business Papers (Inc.), Associates for Government Service (Inc.), Chamber of Commerce of the United States, National Association of Purchasing Agents, National Conference of Business Paper Editors, National Conference of Governmental Purchasing Agents, National Electric Light Association, and the Society of Automotive Engineers.

have been other notable accomplishments in the field of distribution. During the past five years there has been a strong tendency toward the establishment of organizations for economic investigation in this direction supported by the trades themselves. Important among these are the research bureaus of the National Wholesale Druggists' Association, National Retail Dry Goods Association, National Research Bureau, Retailers' National Council, American Association of Advertising Agencies, Association of National Advertisers, and National Paint and Varnish Association.

In addition, the trades have given direct and indirect support to the establishment and maintenance of the Harvard, Northwestern, Stanford, and other schools of business administration and their research bureaus. Furthermore, there has been a notable increase in employment by individual distribution concerns of their own economic experts to revise their methods and direct their work toward eliminating wasteful practices.

Another outstanding development is the growth of the farmers' cooperative idea, the cardinal objective of which is to reduce wastes, not only in production but especially in the methods of distribution, thereby cutting down the spread between producer and consumer. The past effort has largely been a process of getting experience by trial and error and the gradual discovery of what to do and what not to do as well as determining what facilities were necessary in successfully carrying on. With this background of accumulated experience, it is inevitable that the cooperative idea should be constantly increased and we have now entered a constructive period of sound development along this line.

The growth of chain stores, mail-order houses, and other similar agencies has had a tendency toward promoting higher efficiency among the individual wholesalers and retailers by stimulating them to adopt the most practical and efficient methods of these competing agencies. They have an important part in the distribution of certain classes of standard articles where little service is demanded. It is reasonable to expect that the scientific methods used by these various chain and mail-order houses should gradually suggest themselves to the independent outlets who are performing a different type of service in the large field of distribution, particularly where analysis and business principles are shown to be advantageous over chance and rule of thumb.

In recognition of the tremendous problems and difficulties involved in domestic distribution, the Department of Commerce has given active support and cooperation to the trades by the development of the division of domestic commerce. Its aid has been expressed through investigations which could not be easily carried on

by the trades themselves, and has included analyses of the markets for certain commodities, the movements of perishables, and the carrying on of regional commercial surveys.

The commodity studies have, in a number of instances, been the means of aiding producers to find the weak spot in the marketing of their particular product and in suggesting new fields and methods. As a result of these studies many manufacturers are now tabulating and analyzing the relative efficiency of their methods of distribution in various sections, and this has enabled them to build up strength in poorly served districts and to eliminate superfluous sales effort in unprofitable areas. Very gratifying results have thus been achieved in such lines as electrical goods, sanitary ware, paints and varnishes, and progress is being made in other lines. The usefulness of these investigations has by no means been confined to these particular wares, but has on the contrary been extended to manufacturers and merchants and many others through the helpful examples thus afforded.

Through the series of regional market surveys, the department aims to give the industrial and commercial interests a basis for a better understanding of the various economic areas in the country. Each regional survey presents a composite picture of the entire area predicated upon its natural resources, industries, geography, population, economic and social movements and expressions, and particularly the basic factors affecting commerce within the area.

Such surveys form a basis for specialized commodity investigations which, combined, enable the merchant and manufacturer to develop methods leading to more intelligent and intensified sales effort. Regional analyses disclose discrepancies between sales expenditures and potentialities. Following the making of the first survey, that of the Philadelphia area, a number of concerns were prompted to revise or modify their marketing methods in that section. This, and the survey of the southeast comprising Florida, Alabama, Georgia, eastern Tennessee, and the Carolinas, has emphasized the need for the completion of the proposed series of regional surveys embracing the entire United States.

After preliminary discussion between business leaders and the Secretary of Commerce, it was agreed that the United States Chamber of Commerce should sponsor a national distribution conference, and this conference was called in December, 1924. This conference has been responsible for a great increase in interest on the part of the business community in the whole subject of elimination of waste in distribution. Members of the department are actively serving, together with important representatives of trades, upon practically all committees appointed by that conference, and the reports of these committees, which are now in preparation, should

form an important contribution to the whole problem of waste elimination in distribution and the reduction of margin between producer and consumer.

ELIMINATION OF WASTE IN FISHERIES

[By HENRY O'MALLEY, Commissioner of Fisheries]

Saving of waste in our fisheries is progressing along two lines: (1) Cooperation with State and local officials and public-spirited individuals and organizations to stop overfishing and to stimulate propagation; (2) elimination of wasteful methods and processes in the various branches of the industry. The former, being more in the nature of conservation, is dealt with in the annual report of the Commissioner of Fisheries. Of the direct waste eliminations two or three examples may suffice to show what the Bureau of Fisheries is doing along this line.

As a result of its investigations of the crab industry of Chesapeake Bay in 1924, the bureau was able to demonstrate average losses of 50 per cent of crabs purchased for the shedder floats, totaling in excess of 1,000,000 pounds. With the exercise of proper control over the condition of the crabs which the buyers will accept, such losses may be reduced to about 20 per cent. As a result of presenting the facts to the Maryland State Commission and fishermen, material improvement has been effected, and it is expected that final returns will show a saving of 500,000 pounds this season.

Recent investigations of the bureau indicate that the by-product equipment in fisheries is so inefficient that in the menhaden industry alone nitrogenous materials which now escape in the press liquors will aggregate about 20,000 tons, valued at \$1,000,000 per annum. Progress is being made in developing means for the recovery of this material whereby it is expected to salvage the greater part of it. In many of the markets of the larger cities, fish dealers pay to have the fish cuttings hauled away. In one market, in which a single firm has discarded about 2 tons per day, a method of caring for this waste has been developed which is expected to yield a profit on its use in place of an expenditure for haulage. In the fisheries for cod and related species, thousands of tons of cuttings are wasted each year because of a lack of a satisfactory method of handling material so rich in glue, without removing the glue as such. This problem is being studied and it is believed that its solution is near at hand. It is estimated that in the fishery by-product field alone savings in excess of \$2,000,000 per annum may be expected.

Through the bureau's development of copper oleate as a net preservative, it is estimated that by its use the life of much of the

netting has been doubled. The total value of all fishing gear exceeds \$14,000,000, and much of the netting used with this gear lasts only a single season. To offset the higher cost of copper oleate as compared with other preservatives, the bureau is now experimenting with other compounds of copper and combinations with other preservatives to lower the cost of the preservatives used.

STREET AND HIGHWAY SAFETY

[By A. B. BARBER, Director, National Conference on Street and Highway Safety]

The mounting curve of human, material, and financial losses due to street and highway accidents, more particularly those involving motor vehicles, is one of the most conspicuous examples of waste in modern American life. For considerably more than a year the Department of Commerce has carried forward a series of investigations of the problems involved.

As this report is being written the Committee on Statistics has reported that the wastage in human life and physical losses is continuing to increase. The Committee on Metropolitan Traffic Facilities has found that in addition to the economic loss of more than \$600,000,000 due to destruction of life and property, there is a much greater financial loss due to the inadequacy of traffic facilities, amounting to not less than \$2,000,000,000 a year, or nearly \$20 for every man, woman, and child in the country. In addition to its humanitarian stimulus, this work has great importance as a part of the general program for the elimination of waste.

In the spring of 1924 the American Automobile Association, American Electric Railway Association, American Mutual Alliance, American Railway Association, Chamber of Commerce of the United States, National Association of Taxicab Owners, National Automobile Chamber of Commerce, National Bureau of Casualty and Surety Underwriters, and National Safety Council were invited by the Secretary of Commerce to cooperate in the investigation. Eight committees were created, consisting of representative men from all parts of the country, including officials as well as representatives of the cooperating associations, to report on the following phases of the problem: Statistics, traffic control, construction and engineering, city planning and zoning, insurance, education, the motor vehicle, and public relations. The reports, completed in November, 1924, outlined the problems involved and included many remedial suggestions.

In December, 1924, the Secretary of Commerce called a general conference of representatives of all organizations which by reason of their characteristics are or should be interested in a reduction of

the street and highway accident rate. This conference was attended by approximately 600 delegates, representing railroads, insurance companies, street railways, automobile manufacturers, organized commerce and industry, taxicab companies, safety councils, State highway officials and motor-vehicle commissioners, local police and traffic administrators, organized labor, organized motorists, women's and welfare organizations, engineers, educators, and the general public.

The eight committee reports were presented to the conference, which in turn adopted a consolidated report embodying an important series of recommendations for State legislation, street and highway regulations, suggestions for cooperative work, and a program of future activities. The conference also adopted resolutions providing for a second conference to be held after approximately one year, for a joint committee to carry on the work, and for a committee to promote the adoption of the recommendations of the first conference.

Early in the calendar year 1925, with the cooperation of the same national organizations, and with the addition of the National Research Council, six committees were appointed by the Secretary of Commerce to carry on further the work of investigation.

The National Conference on Street and Highway Safety is nationwide in its scope. Its purpose, however, is to secure results through stimulation of State and local action. Its activities have assisted in focusing widespread public attention on the automobile accident problem, and in crystallizing opinion on remedial measures which should bear definite results. A beginning has been made of the application of these measures by State legislatures, and an important influence has been manifested in regard to municipal regulation and organized community effort.

Part II.—ECONOMIC REVIEW

Taking the Nation at large, the outstanding features of the fiscal year were the high rate of production, consumption, and exports; high real wages; the absence of any consequential unemployment; continued growing efficiency in management and labor; continued expansion in application of scientific discovery in such fields as electric power and light, the gas engine, and radio. There were industrial patches where progress lagged, as in the New England textile industry, various sections of the agricultural industry, and the bituminous coal industry. Nevertheless, the standard of living of the country as a whole was the highest in our history, and therefore the highest in all history. Our greatest concern must be to maintain the present high level of production and savings without an orgy of speculation and ultimate collapse.

Some of the more outstanding features of the economic progress of the year are more fully covered in the following paragraphs:

INDUSTRY

The general condition of manufacturing and trade during the past three years is indicated by the following tables:

TABLE I.—MAJOR ECONOMIC INDEXES
BASED UPON CALENDAR YEAR 1919 AS 100

	Years ended June 30—		
	1923	1924	1925
Volume of business (quantities, not value):			
Manufacturing production.....	116	115	118
Mineral production.....	115	128	124
Forest products, production.....	117	122	120
Freight, railroad, ton-miles.....	109	110	110
Electric-power production.....	136	148	168
Building contracts let, square feet.....	107	108	111
Factory employment.....	77	81	82
Value of sales:			
Department stores.....	118	125	126
Five and ten cent stores.....	152	173	194
Mail-order houses.....	91	100	110
Wholesale trade.....	80	82	83

TABLE I.—MAJOR ECONOMIC INDEXES—Continued

BASED UPON CALENDAR YEAR 1913 AS 100

	Years ended June 30—		
	1923	1924	1925
Wholesale prices:			
General average.....	156	150	155
Farm products.....	139	140	153
Food.....	142	143	153
Cloth and clothing.....	193	194	189
Fuel and lighting.....	220	175	169
Metal and metal products.....	139	141	130
Building materials.....	188	182	174
Chemicals and drugs.....	129	129	133
House-furnishing goods.....	181	178	171
Miscellaneous.....	122	116	124
Retail prices:			
Food.....	143	146	150
General cost of living.....	169	171	172

A large volume of new construction and a further expansion of automobile production were the chief features of the industrial situation. Contracts let for commercial and industrial buildings showed an especially large increase during the first half of 1925. The total manufacturing output was also larger, and there was a slight increase in the number of factory employees. Production of minerals and forest products, on the other hand, was somewhat smaller than in 1923-24, although much larger than in other postwar years.

Retail trade increased during 1924-25 and was larger than in any previous year on record. The expansion of mail-order sales amounted to 10 per cent, as a result of improved buying power among the farm population, caused by the fact that prices of farm products and foods advanced 9 and 7 per cent, respectively, as compared with decreases in the wholesale prices of most other commodities. As a result of higher food prices, the cost of living has shown a slight increase.

CONSTRUCTION

The greatest volume of construction operations on record, representing a total investment of more than \$6,000,000,000, was carried out under the most noteworthy circumstances. Building-cost indexes declined perceptibly during the execution of this tremendous program. This was possible because the construction industry and building owners responded to the movement for stabilization organized by the industry with the cooperation of this department for the purpose of keeping the industry employed more actively throughout the year, instead of allowing it to operate at only a fraction of its

capacity during most months. There was practically none of the obvious and gross inefficiency and waste which has usually accompanied building "booms" in the past, and the industry continues in a healthy condition ready to meet continuing demands upon it. Building activity was well distributed throughout the different regions of the country, and there was apparently an increased consumption of building materials on farms.

Expenditures for construction activity find their way into a highly diversified group of industries. In this case a considerable part of the activity in scores of manufacturing industries, as well as in lumbering, metal mining, and railway transportation, was due to the high rate of construction of the past fiscal year. The immediate demand for construction at a given time is extremely sensitive and liable to variation. Hence it is a matter of great concern that this industry, the greatest balance wheel in our economic system, should run in fine adjustment to our other economic needs.

The construction accomplished was for the most part well calculated to meet the permanent and growing needs of the Nation. There was no reminder of the extravagant additions to productive capacity of the boom year 1920, when industrial plants were enlarged out of all proportion to reasonable needs, and with but little reference to effecting economies in production. In that year only 22 per cent of all construction was for residential purposes, while in the past fiscal year more than 46 per cent went into homes. There was also a record-breaking expansion in public works and utility development.

Although some instances may be claimed of expenditures not justified by current needs, the sum spent for construction for the most part represented not only a keeping pace with the needs of expanding population, but also a substantial bettering of the country's housing and commercial facilities. The additions to commercial and public plant and transportation all tend to raise living standards and promote elimination of waste in our commercial and industrial life. Our national savings are accumulating at an unparalleled rate, and it is especially desirable to have them invested now in domestic permanent capital improvements which contribute directly to the well-being of our people. For by such devotion of our savings we both encourage thrift and raise the standard of living.

The housing shortage arising from the war has not yet been substantially relieved for the lower income groups, and one of the great tasks ahead of the country is to organize this field so that new homes may be reasonably financed and owned preponderantly through the thrift of the individual families who occupy them. The better organization of the "second mortgage" onto a more reasonable basis is one of the outstanding factors.

TABLE II.—CONSTRUCTION STATISTICS
 BASED UPON CALENDAR YEAR 1919 AS 100

	Years ended June 30—		
	1923	1924	1925
Contracts awarded, value.....	135	143	162
Contracts awarded, volume in square feet of floor space.....	107	108	111
Cement shipments.....	152	157	178
Lumber production.....	117	121	121

PRICE INDEXES BASED ON CALENDAR YEAR 1913 AS 100

Frame-house materials (Department of Commerce retail index).....	198	206	198
Wholesale building material prices (Department of Labor).....	188	182	174

AGRICULTURE

Advances in prices of agricultural commodities, together with a large volume of production and marketing, caused the farm income to reach a greater total in the crop year 1924-25 than in any year since 1920-21. Price advances were very pronounced in the case of the various grains. Many weak spots continue, but the general situation is much improved. The prices of farm products as a whole have now practically reached the level of the general average for all commodities, the wholesale price of farm products being 53 per cent above pre-war, while the average of all commodities is 55 per cent above pre-war.

September forecasts indicate that the aggregate output of all crops during the present year will be about 6 per cent smaller than last year, but this will probably not adversely affect farm communities since it has been just about offset by advances in agricultural prices. The wheat crop this year is about one-fifth smaller than last year, and the potato crop is the smallest since 1919, whereas production of corn, barley, and cotton has increased. Prices of all kinds of meat animals, dairy products, and potatoes on October 1, 1925, were substantially higher than a year earlier, but prices for all grains except wheat were lower. As a result of the successive rises in the prices of cotton, grains, and animal products during the past three years the agricultural industry has now reached a better adjustment with other industries than at any time since the war.

TRANSPORTATION

Greater traffic was handled during the fiscal year 1925 than ever before in our railroad history. Our railroad facilities proved equal to the heavy demand placed upon them, and this traffic was handled not only with practically no car shortage but also with greater speed than in previous years. The highly successful operation of our railroads during the last fiscal year reflects the greatest credit upon the efforts of the managers and employees, aided by the cooperation of

the shippers and receivers of freight. The regional advisory boards, committees of shippers and receivers of merchandise which have now been formed throughout the United States, have been an important factor in enabling the railroads to care for increasing traffic and at the same time reduce delays in loading and unloading freight. The steady increase in ratios of car and train loadings represents a great contribution to efficiency.

Car shortage and delays of traffic in transit tend to increase commodity prices for the consumer and to reduce the income of the producers, and at the same time impair the carrying capacity of the railroads. Economic losses arising from these costs have been largely minimized. Extensions of terminals and the problem of rate adjustments are still before us. The problems of railroad consolidations are yet to be solved. Improvement in railroad finances and services is dependent upon the solution of these problems. That transportation facilities shall keep pace with the demands upon them is necessary for our economic stability.

The following tables show the essential items in our transportation situation as compared with the three previous fiscal years:

TABLE III.—RAILROAD OPERATIONS

	Years ended June 30—				Per cent change, 1924 to 1925	
	1922	1923	1924	1925		
Freight, ton mileage (millions).....	351,536	431,035	436,737	437,328	+0.1	
Average weekly car loadings.....	782,000	908,000	942,000	955,000	+1.4	
Carloads of all commodities.....	40,657,504	47,192,796	48,991,763	49,638,148	+1.3	
Net tons per train.....	656	704	706	731	+3.5	
Net tons per loaded car.....	26.8	27.7	27.2	27.0	-.7	
Average daily car surplus.....	272,756	36,399	187,554	252,410	+34.6	
Average daily car shortage.....	2,410	74,689	4,793	295	-93.8	
Bad-order cars:						
Average for year.....	339,369	241,218	170,546	194,519	+14.1	
Number at end of year.....	324,583	190,411	194,869	198,468	+1.8	
Bad-order locomotives:						
Average for year.....	15,764	16,069	10,838	11,514	+.6	
Number at end of year.....	14,412	11,450	11,034	10,917	-1.1	
Number of employees.....	1,643,000	1,770,000	1,850,000	1,765,169	-4.6	
Total operating revenues (1,000 dollars).....	5,508,169	6,104,274	6,120,646	6,009,956	-1.8	
Net operating income (1,000 dollars).....	818,345	873,777	924,674	1,033,852	+10.6	
			Calendar years—			
			1921	1922	1923	1924
Number of locomotives:						
Installed.....			1,330	1,226	4,360	2,775
Retired.....			1,130	1,682	3,746	2,524
In service end of year.....			64,949	64,512	64,948	65,006
Number of freight cars:						
Installed.....			63,406	105,394	232,060	155,178
Retired.....			69,245	126,471	213,789	117,727
In service end of year.....			2,344,780	2,332,286	2,345,591	2,348,676

NOTE.—Certain of the above items relate only to Class I roads which, however, include about 98 per cent of the total.

OCEAN SHIPPING

The percentage of the volume of our oversea foreign trade carried in American ships increased 1 per cent during the calendar year 1924, from 40 to 41. Privately owned American vessels in 1924 gained two points over 1923, carrying 29 per cent, while Shipping Board vessels transported 12 per cent as compared with 13 in 1923. The American seagoing merchant fleet, 500 gross tons and over, totaled 12,250,000 gross tons at the beginning of 1925, a decline of 538,000 gross tons during the year 1924, which represents largely the tonnage of vessels scrapped. For this and other reasons idle American tonnage declined slightly during the year ended June 30, 1925, while the idle tonnage of other countries increased. In general, American trade was adequately served during the year. Some progress was made in transferring Government-owned ships to private companies.

BANKING AND FINANCE AT HOME AND IN FOREIGN TRADE

The bankers' figures at the end of the year indicate a high degree of stability in a period of fairly substantial prosperity. All banking operations consistently kept pace with the increases in production, employment, and prices during the year. Rediscounts at the Federal reserve banks increased from \$350,000,000 to \$455,000,000, partly because of this increased business activity and partly because of the recent net outflow of gold. Rates on prime commercial paper were steady at $3\frac{3}{4}$ and 4 per cent during June, 1925, showing a slight increase for the year, while the Federal reserve discount rates at New York remained at $3\frac{1}{2}$ per cent, the same as one year before, although the yield on short-term Treasury obligations increased from $2\frac{3}{8}$ to $2\frac{7}{8}$ per cent and prime bankers' acceptances from $2\frac{1}{8}$ to $3\frac{1}{4}$ per cent. These changes all reflected the increasing demands by the business world upon the supply of loanable capital.

The total volume of money in circulation on July 1, 1925, was \$4,734,236,000, which was only \$21,000,000 less than one year before, but there was a notable shift to circulation of gold and gold certificates, the latter having increased by \$233,000,000, with corresponding decreases in notes. This process of putting gold and gold certificates into circulation, together with the considerable volume of net gold exports during the year, has made for monetary stability and minimized the dangers from inflation threatened by superabundant gold holdings.

Perhaps the most encouraging feature of the period was the progress made throughout the world in the stabilization of monetary systems. The setting up of the machinery of the Dawes plan in Germany, in August, 1924, was a helpful beginning in this direc-

tion. The reorganized Reichsbank commenced the issuance of new currency based upon gold to replace the old inconvertible currency. On April 29, 1925, Great Britain and the Netherlands simultaneously resumed specie payments, and this example was immediately followed by New Zealand, Canada, the Union of South Africa, and the Dutch East Indies. These favorable developments had already been preceded in April, 1924, by Sweden's return to the gold standard and the establishment of sound currency conditions in such countries as Switzerland, Austria, and Czechoslovakia. The countries of Latin America which are not already on a gold standard have made marked progress toward sound monetary conditions and stable exchange.

The progress in the reestablishment of the gold standard is of incalculable importance to international trade, which has been so severely hampered by the uncertainty resulting from exchange fluctuations. The volume of the world's total international trade, counting both imports and exports, now aggregates about \$50,000,000,000. The great bulk—more than two-thirds—of this total represents the foreign trade of the United States, Great Britain, the British Dominions, and the other countries whose currencies are stabilized in relation to gold. The foreign trade of those countries that have long been on a silver basis might well be included with these gold-standard nations, in which case it appears that the financing of an overwhelming proportion of the world's trade will henceforth be done on a metallic monetary basis comparable to that of before the war.

In this work of stabilizing the world's currencies the United States has been of great assistance to the other nations through the granting of stabilization credits by our banks and the flotation of loans in our security market. The gross volume of foreign securities publicly offered in this country during the fiscal year ended June 30, 1925, amounted to \$1,382,000,000, of which \$292,000,000 were refunding issues and \$1,090,000,000 were new capital. This represents an increase of \$640,000,000 in new capital over the preceding fiscal year. Europe received more than half of the total new capital, with borrowings amounting to \$655,000,000, of which \$594,000,000 were for the account of Governments and enterprises enjoying a governmental guarantee while only about \$62,000,000 were borrowed by private enterprises. Canada came second in volume of new capital, with borrowings amounting to \$197,000,000, and Latin America came third, with \$182,000,000, while Asia received only \$24,000,000.

In addition to these flotations, the Federal Reserve Bank of New York and a New York banking syndicate extended credits amounting to \$300,000,000 to the Bank of England and the British treasury,

respectively, to insure the successful stabilization of the pound sterling. The three Italian banks of issue obtained a \$50,000,000 revolving credit for exchange stabilization and the Danish Government received a \$40,000,000 loan for a similar purpose. Numerous less important bankers' credits were also extended.

This increase in foreign loan flotations in New York can partially be accounted for by an easy money market.

During the latter part of the fiscal year the embargo on foreign loans in London, which was adopted to insure the stability of the pound sterling in connection with the return to the gold standard, served to divert some loans to New York which otherwise might have been floated in London. The total foreign loans floated in London, excluding refunding issues, during the fiscal year ended June 30, 1925, and including colonial and dominion borrowings, amounted to only about £96,823,800 (\$471,193,023 at par of exchange), or less than half of the volume of such loans sold in the United States.

The reversal of the gold movement was another extremely important development during the year. It was the first year since 1919 during which gold exports from the United States exceeded gold imports to the United States. Total imports during the year amounted to \$134,000,000 and total exports amounted to \$249,000,000, leaving a surplus of exports of \$115,000,000, whereas there had been a surplus of imports of \$407,000,000 during the fiscal year ended June 30, 1924.

The change began in December, 1924, when there was a surplus of gold exports of approximately \$29,000,000. All the subsequent months of the fiscal year showed a surplus of exports. Factors contributing to this development were (1) the withdrawal in gold by the new Reichsbank of Germany of a large part of the proceeds of the \$110,000,000 Dawes plan loan to the German Government floated here; (2) the premium on the Australian pound, which gave a further impetus to the outward movement of gold, inasmuch as it became more profitable to ship gold to that country than to purchase bills of exchange (this is partly because of the three-cornered nature of New York exchange transactions on Australia, most of which are consummated through London); (3) large gold shipments to India, the result of agricultural prosperity, the cheapness of this metal in terms of other commodities. In other words, gold ornaments were obtainable in India at bargain prices.

Finally, mention should be made of the debt-funding settlements between our Government and the Governments of Finland, Poland, Hungary, Lithuania, Czechoslovakia, and Belgium as encouraging factors all pointing to the progress made by the world in recovering from the Great War.

FOREIGN TRADE

Exports and imports both showed substantial increases in the fiscal year. The excess of merchandise exports amounted to \$1,041,000,000, which was larger than in either of the two preceding years. There was also an excess of gold exports totaling \$115,000,000, in contrast with excesses of imports in most other recent years. The balance of exports of merchandise and gold has been largely covered by American loans to foreign countries. The following table shows changes in the value of trade and trade balances compared with pre-war and recent years:

TABLE IV.—FOREIGN TRADE OF THE UNITED STATES

[In millions of dollars]

	Years ended June 30—				Per cent change, 1925 from—	
	1910-1914	1923	1924	1925	1910-1914	1924
Exports, merchandise.....	2,166	3,957	4,312	4,865	+124.6	+12.8
Imports, merchandise.....	1,689	3,781	3,554	3,824	+126.4	+7.6
Excess of exports (+) or of imports (-):						
Merchandise.....	+477	+176	+758	+1,040	+102.2	+37.3
Gold.....	+18	-235	-407	-115	-----	-----
Silver.....	+20	-9	+19	-37	-----	-----
Merchandise, gold, and silver combined.....	+515	-68	+370	+1,192	+131.7	+222.6

Exports of domestic merchandise increased \$554,000,000 during 1924-25, and two-thirds of this increase occurred among the unmanufactured products. Exports of crude foodstuffs reached a value over twice as large as in 1923-24, since the coincidence of large crops of bread grains in this country with small crops in Europe resulted in larger grain shipments from the United States at higher prices. Exports of manufactures, which are less affected by changes in supply and demand than crude foodstuffs and materials, increased 8 per cent, continuing an upward trend which has been in evidence for many years.

The gain in imports, which totaled \$270,000,000, was confined largely to crude materials. Imports of this class were 19 per cent larger than in the previous year as a result of the increased activity of our manufacturing industries.

Our foreign trade with all continents except Asia increased in value during 1924-25. Exports to South America were 28 per cent larger than in 1923-24 as a result of increased exports of manufactures, while exports to Europe increased 21 per cent due to larger shipments of grain and cotton. A decline occurred in our exports to Asia, in consequence of internal disturbances in China, and less-

ened demand from Japan for materials to replace earthquake damage. Imports from all continents except North America increased in value, and the decline for this continent may be ascribed entirely to the lower price of sugar.

Changes in the volume of foreign trade during the past four years as compared with 1913 are shown in the following table for some of the leading commercial nations:

TABLE V.—VALUE OF FOREIGN TRADE ADJUSTED TO 1913 PRICE LEVELS
BASED UPON CALENDAR YEAR 1913 AS 100.

	Years ended June 30—			
	1922	1923	1924	1925
United States.....	105	116	122	131
United Kingdom.....	75	86	90	99
France.....	86	94	109	105
Germany ¹				72

¹ Not available for 1922, 1923, and 1924, on account of currency fluctuation.

As compared with 1913, the value of our trade with Asia increased 244 per cent, and that with Oceania and South America 230 and 136 per cent, respectively.

At least some part of the expansion of our foreign trade in recent years may fairly be attributed to the increased activity of the Department of Commerce. The steady growth of our service in the promotion of overseas trade is indicated by the fact that the number of demands for services from exporters, merchants, bankers, and others interested in foreign trade increased 75 per cent during the past year and were about ten times as many as in 1921. As an illustration of the results obtained through these services it may be noted that 175 firms to which the department rendered material assistance during 1925 obtained business which reached a total value of \$73,000,000. The number of firms currently receiving foreign-trade service from the department is now about 18,500.

Part III.—LEGISLATIVE RECOMMENDATIONS

The law requires that the Secretary of Commerce shall include in his annual report "such recommendations as he shall deem necessary for the effective performance of the duties and purposes of the department." In accordance with this requirement, the following recommendations are submitted:

ADEQUATE BUILDING FOR DEPARTMENT

Past annual reports have directed attention to the pressing need of an adequate Government-owned building to house the activities of this department. The necessity of immediate action in this matter can not be too strongly urged. The department is scattered through buildings, of which one is a composite of seven old houses. The lease on the main building expires in less than four years and the owners have declined to give the department an option for further renewal at the same rental. Temporary war buildings occupied are a menace to health and the fire hazard to costly records is enormous.

Since the last annual report the Bureau of Mines and the Patent Office have been transferred from the Department of the Interior to this department. The Patent Office is housed in an antiquated building utterly unfit for its requirements, and representing a serious fire hazard to patent records which are irreplaceable. It costs several thousand dollars more to operate the office than would be required in an adequate building. Owing to the crowded condition of the main building the Bureau of Mines has been compelled to remain in its Interior Department quarters.

The scattering of the bureaus only tends to impair the efficiency of the work, and is costly and inconvenient to the public. In the interest of sound economy and good administration, all functions, exclusive of the Bureau of Standards, should be housed in one Government-owned building, large enough to provide for present activities and allow for future expansion.

FEDERAL TAXES ON AMERICANS RESIDENT ABROAD

The United States is the only important nation which imposes domestic taxation upon the earned income of its citizens resident abroad engaged in the expansion of commerce. While provision is made for deduction of foreign taxes, this has real effect only in highly taxed countries, and does not afford adequate relief in those

areas where we need expansion most, as in Latin America and the Far East. Other countries have given complete relief in this particular and our nationals are thus placed at great disadvantage.

We shall have neither a staple export in manufactured goods, nor a successful merchant marine so long as the distribution of American goods rests in the hands of other nations. The marketing of our goods abroad is a matter of ability and zeal in representation as well as of competitive prices. The effect of increased taxation from the war, which our country alone applies to earned incomes of citizens abroad, tends to drive them out of the front line of commerce. Legislation should be enacted to relieve our nationals from this burden. This suggestion is not made to include returns on foreign investments of residents or of nonresidents or to relieve expatriates, but solely to place those engaged in advancing American trade abroad upon terms of equality with their competitors.

FEES CHARGED FOR PASSPORTS

The fees now charged for passports and visas are irksome and provocative of resentment abroad. This is reflected in retaliatory measures that handicap American merchants and traveling salesmen in foreign countries. The fees should be radically reduced and formalities thoroughly revised and simplified. It is reassuring to note that progress is being made in this direction through the State Department.

REVISION OF THE NAVIGATION LAWS

As noted in my annual report a year ago, the navigation laws are badly in need of revision. Under acts of Congress providing for recommendations in this respect, a large amount of work has been done, and it had been hoped that a complete plan of revision, bringing into harmony and clarity the various provisions, would be ready for submission at the last session. The completion of this work has, however, been delayed. It is of the greatest importance to the shipping public, to the officials whose duty it is to enforce navigation laws, and to those actually engaged in the industry that the codification of these laws be no longer delayed.

The following items of legislation are recommended for the various bureaus concerned:

BUREAU OF FOREIGN AND DOMESTIC COMMERCE

For the Bureau of Foreign and Domestic Commerce legislation is needed to make possible a further expansion and systematization of the field services—the district offices in the United States and the foreign-service posts—in order that there may be an even more

thorough, comprehensive gathering of commercial facts abroad, and a more intimate, effective distribution of them in this country. Only in this way can our exporters be assured of a genuinely secure and permanent position in the world's markets.

Less than 10 per cent of the total funds of the bureau are supported by permanent legislation, the remaining portion having been built up year by year through appropriations devoted largely to the foreign service. This growth has been in process for more than 12 years and every stage has been subjected to careful trial and the closest scrutiny by selected congressional committees and interested trade organizations. The service has survived this period of trial. Legislation is therefore needed to provide statutory warrant for such an organization.

The inadequacies of the \$4 per diem travel expense allowance are too evident to require argument. The staff of this bureau maintains its value to the business community largely through a mobile, active service, the first prerequisite of which is a considerable amount of individual travel, especially in various trade markets. For years this has meant a severe financial penalty on every member of the staff and some corrective of such gross injustice is imperatively necessary. This is also true of the other bureaus in the department.

BUREAU OF THE CENSUS

With a view to avoiding duplication, it is recommended that the collection of statistics concerning the quantities of leaf tobacco held by certain classes of manufacturers and dealers be transferred from the Bureau of the Census to the Bureau of Internal Revenue. If this transfer be not made, it is recommended that the present law under which the Bureau of the Census collects leaf-tobacco statistics be so amended that the affidavits to the reports be accepted when made before postmasters.

That the act of August 7, 1916, concerning cotton consumed in the manufacture of guncotton and other explosives, be repealed, since this information, originally desirable on account of war conditions, is no longer important. The Navy Department requested the discontinuance of the publication of these data during the war.

That the act of March 3, 1919, providing for the collection of statistics of the products of manufacturing industries every second year, be amended so as to authorize the collection and publication of statistics of current production, consumption, stocks, shipments, orders, receipts, and sales for commodities used and produced in manufacturing.

STEAMBOAT INSPECTION SERVICE

Amendment of sections 4433 and 4418 of the Revised Statutes in regard to the working and hydrostatic pressure of boilers, so as to enable the service to modernize the rules and regulations covering these matters.

That section 4404 of the Revised Statutes be so amended as to include the supervising inspectors in the classified civil service, and that the number of supervising inspectors be decreased from 11 to 10.

BUREAU OF NAVIGATION

The transfer from the Treasury Department to the Department of Commerce of the staff of officers engaged in measuring tonnage of vessels has been approved by both departments and is essential to the uniform application of our admeasurement laws and regulations, so as to prevent discrimination against American vessels and to bring our admeasurement system up to the standard of other maritime nations. This work should be performed by men selected because of their technical knowledge of ship architecture and admeasurement and with the training to solve the mathematical problems often involved.

It is imperative to the welfare of our merchant marine that legislation be enacted establishing load lines, substantially similar to that of the European maritime powers. In the absence of such a law our cargo-carrying steamers are allowed to clear from many foreign ports solely as an act of courtesy and not as a matter of right.

LIGHTHOUSE SERVICE

Provision of medical relief for light keepers at remote stations inaccessible to Public Health Service hospitals and extension of Public Health Service treatment to employees on lighthouse vessels.

Authorization of the payment of claims of lighthouse employees for losses of personal property incident to their work.

Extension to lighthouse employees of privileges now accorded to similar services respecting the purchase of commissary supplies and transportation.

Part IV.—CONDENSED REPORTS OF BUREAUS

ADMINISTRATIVE DIVISIONS OF THE OFFICE OF THE SECRETARY

DEPARTMENT OF COMMERCE,
OFFICE OF THE CHIEF CLERK,
Washington, July 1, 1925.

HON. HERBERT HOOVER,
Secretary of Commerce.

DEAR MR. SECRETARY: In response to your request I furnish the following condensed report of the work of the various divisions of the Secretary's office during the past year:

These divisions, in addition to the immediate offices of the Secretary and Assistant Secretary, consist of the office of the solicitor, the chief clerk and superintendent, the disbursing office, the division of appointments, the division of publications, the director of purchases and sales, the division of supplies, the stock and shipping section, the traffic manager, the department library, the telegraph office, telephone exchange, the motor equipment, and the department garage.

The taking over of the Patent Office and the Bureau of Mines, together with the ever-increasing work of the department, has its reflection throughout the various divisions of the Secretary's office, which have long been undermanned, and has added greatly to their work. As in former years, in addition to much overtime work it has been necessary to call upon several of the bureaus of the department for help in the way of details which they could ill afford to spare. This is a very unsatisfactory arrangement and does not afford the stability which should exist among the personnel, nor does it permit the most efficient administration. The work of the various divisions is largely specialized and best results can only be obtained through the medium of a stable personnel not subject to frequent change. The remedy lies in an adequate personnel for the office of the Secretary, which for several years we have endeavored to obtain.

COOPERATION WITH FEDERAL AGENCIES

During the year the department, through the divisions of the Secretary's office, has assisted in effecting economies and improved methods of administration throughout the Government service by

representation upon many coordinating boards and committees. The chief clerk is chairman of the Association of Chief Clerks of the Executive Departments; member, executive committee, Board of Simplified Office Procedure; chairman, subcommittee on forms, Board of Simplified Office Procedure. The chief of the appointment division served on a large number of committees. He is president of the Appointment Clerks' Association (composed of personnel officials of departments and independent establishments); chairman of the departmental Classification Board and acts as classification officer for the department. The chief of the division of publications represented the department on several committees as did the director of purchases and sales, the disbursing clerk, and the traffic manager.

GOVERNMENT-OWNED BUILDING FOR THE DEPARTMENT

Attention is again invited to the imperative need for a Government-owned building for the department. As has been repeatedly stated, the department has long ago outgrown its present quarters, and good, efficient, and economical administration can not be had with the bureaus separated from the main building as they now are.

The department is now in the second year of a final five-year lease, which expires June 30, 1929, and the owners have declined a renewal at the present rental, \$65,500 a year, plus \$1,400 for the rent of the water-cooling system.

Since its occupancy of the Commerce Building to June 30, 1925, the Government has expended \$776,180.07 in rent, including the water-cooling system, and at the expiration of the present lease June 30, 1929, the amount will total \$1,043,780.07.

If at the expiration of the present lease it becomes necessary to occupy rented quarters the department will be confronted with a serious problem. To obtain a building suitable for the department's needs at the present rental is beyond the range of probability. The remaining time before the expiration of the lease is far too short to longer defer the project, and in order that the department may not be without a home immediate steps leading to the erection of a building adapted to the needs of the department should be undertaken.

DISBURSING OFFICE

APPROPRIATIONS AND EXPENDITURES

The itemized statement of the disbursements from the contingent fund of the department and the appropriation for "General expenses, Bureau of Standards," for the fiscal year ended June 30, 1925, required to be submitted to Congress by section 193 of the Revised Statutes of the United States; the itemized statement of expenditures under all appropriations for propagation of food fishes during the fiscal year ended June 30, 1925, required by the act of Congress approved March 3, 1887 (24 Stat. 523); a statement showing travel on official business by officers and employees (other than special agents, inspectors, and employees who, in the discharge of their regular duties, are required to travel constantly) from Wash-

ington to points outside of the District of Columbia during the fiscal year ended June 30, 1925, as required by the act of Congress approved May 22, 1908 (35 Stat. 244); and a statement showing typewriters, adding machines, etc., exchanged by this department during the fiscal year ended June 30, 1925, as required by section 5 of the act of March 4, 1915 (38 Stat. 1161), will be transmitted to the Congress in the usual form.

Table 1, page 51, shows the total amount of all appropriations for the various bureaus and services of the Department of Commerce for the fiscal year ended June 30, 1925.

Disbursements by the authorized disbursing officers of the department during the fiscal year ended June 30, 1925, arranged according to items of appropriation, are shown in Table 2, page 52.

Warrants drawn on the Treasurer of the United States to satisfy accounts settled by the General Accounting Office during the fiscal year ended June 30, 1925, classified according to items of appropriation, are shown in Table 3, page 58.

A statement of the expenditures during the fiscal year ended June 30, 1925, on account of all appropriations under the control of the department, giving the total amount expended by each bureau, is shown in Table 4, page 62.

Miscellaneous receipts are shown in Table 5, page 62.

Unexpended balances of appropriations turned into the surplus fund June 30, 1925, are shown in Table 6, page 63.

A statement showing unused amounts of appropriations turned back into the Treasury during the last nine years is shown in Table 7, page 65.

APPOINTMENT DIVISION

The fiscal year 1925 has been a record year for development in connection with personnel administration. A number of factors have contributed to this condition:

(1) The work of carrying out the provisions of the classification act on July 1, 1924, delayed, as stated in the last preceding report, was not entirely completed for several months, although the essentials were accomplished in time to obviate any interruption of service or delay in the payment of the personnel. The initiation of this work involved 3,391 changes. The system having been established, a steady stream of new allocations by reason of change of duties, new appointments, and reallocations, aggregating over 1,600 for the fiscal year, called for constant attention.

(2) Classification necessarily brings in its train appeals of employees from the allocations assigned, which during the year amounted to 275 submitted, 223 of which have been acted upon prior to the end of the fiscal year. This does not include appeals submitted by employees of the Patent Office and the Bureau of Mines prior to their transfer to this department, totaling 66, action on 47 of which was effected subsequent to the transfer.

(3) Additional requests for periodic statements and supplementary detailed explanatory statements called for by other Federal agencies in connection with economy policies, and for other purposes.

(4) Additions to the personnel by the transfer of organizations from the Department of the Interior, as follows:

April 1, 1925, under authority of the Executive order of March 17, 1925, the Patent Office, involving approximately 1,254 personnel.

July 1, 1925, under authority of the Executive order of June 4, 1925, a section of the Geological Survey and practically all the Bureau of Mines, including the helium production plants under the jurisdiction of the Navy Department the transfer of which had previously been authorized by the act approved March 3, 1925, to the Bureau of Mines. This addition involved 971 employees.

In spite of an 80 per cent addition to the personnel of the division during the fiscal year and occasional assistance rendered by temporary details from other sections of the department, the work has maintained a constant abnormal pressure and only by curtailing leave and voluntary overtime work on the part of the employees has congestion been avoided. Cramped quarters and the impracticability of a needed extension add to the difficulties.

Table No. 8, page 66, shows by bureau, sex, and nature of appointment status the strength of the personnel at the commencement of the present fiscal year. A net increase is indicated of nearly 38 per cent over that last reported, largely by transfers from the Interior Department previously referred to. This increase carries with it augmented work in connection with personnel changes, which shows over 58 per cent increase to the end of the fiscal year as indicated by the analysis given in Table 9, page 66.

Table 10, page 68, summarizing by bureau the amount of leave with pay taken during the calendar year 1924 by the employees shows a slight reduction in the average of such absences (34.39 as compared with 34.69) for the calendar year 1923.

In spite of criticism which might indicate otherwise, the effort to improve the morale and standard of the personnel of the Federal service, initiated by the enactment of the classification act of 1923, has resulted in a betterment generally. There are doubtless many inequalities to be leveled, but it is questionable whether they are the fault of the system or of the basis on which initiated and of restrictions subsequently imposed. The classification act presupposes that efficiency ratings should be an essential component part of the system. Had efficiency been utilized as a basis for determining the salary of employees in the several classification grades, the result would have been more satisfactory, but in the absence of efficiency ratings the compensation in the grade was based upon salaries under the more or less inadequate prior system. Under the promotion policy adopted by the department this will in time be overcome, but several years of operation will be necessary.

Renewed efforts on the part of the friends of Federal employees to secure the enactment of legislation liberalizing the civil-service retirement act have not met with success. It is hoped that better results will be obtained from the coming session of Congress to increase the maximum allowance, to authorize a service retirement, and in other respects to rectify the generally accepted deficiencies of the current system. During the fiscal year under consideration 28 employees were retired under the provisions of the act of May 22, 1920, the average annuity being \$618.51.

DIVISION OF PUBLICATIONS

CENTRALIZATION OF SUPERVISION

Coincident with the transfer of the Patent Office and the Bureau of Mines to the Department of Commerce, the division of publications assumed general supervision of the printing and binding for those services and the conduct of all such business to be transacted with the Government Printing Office. Detailed records in connection with appropriations, expenditures, requisitions, progress of work, etc., will be maintained in that division. This added work has increased considerably the duties and responsibilities of the division of publications. The amounts transferred to the Department of Commerce from appropriations for printing and binding made to the Interior Department for the fiscal years 1924, 1925, and 1926 were: Patent Office—1925, \$370,366.64; 1926, \$880,000. Bureau of Mines—1924, \$1,558.84; 1925, \$26,784.92; 1926, \$70,870.

EXPENDITURES IN 1925 AND APPROPRIATIONS FOR 1926

Table 11, page 68, shows expenditures for printing and binding during the fiscal year 1925 and the allotments made of the appropriations available for 1926.

SALES OF DEPARTMENT'S PUBLICATIONS

Distribution of the department's publications on a sales basis continues to increase. During 1924¹ the receipts amounted to \$138,640.27, as compared with \$127,525.34 in 1923 and \$97,684.70 in 1921. Table 12, page 69, presents figures for the fiscal years 1922, 1923, and 1924.

DIVISION OF SUPPLIES

The following is a brief report of the work undertaken and accomplished by the division of supplies along the line of simplification, coordination, relative to purchases, sales, and contracts, during the fiscal year ended June 30, 1925.

PURCHASES

This office has, as was done during the fiscal years 1923 and 1924, maintained during the fiscal year 1925 the centralized information pertaining to the department's surplus property, and has acted on all proposals for supplies and materials emanating in its field services, in addition to handling such proposals in obtaining clearance through the General Supply Committee, and returning them to the issuing office.

Through the cooperation of the Chief Coordinator's Office of the Bureau of the Budget, this office secured, without transfer of funds, office equipment, clothing, mechanical supplies, etc., valued at approximately \$40,000 for different bureaus of the department.

¹ Statements showing sales by the Superintendent of Documents for 1925 are not yet available.

The gross expenditures on the 10,634 purchase orders issued and the freight, travel, and miscellaneous accounts handled by this office amounted to \$813,722.82.

Below is tabulation showing the increase and decrease in the requisitions, orders, etc., between the fiscal years 1924 and 1925, which is an indication of the variation of all branches of the division's work between the two years:

	1924	1925	Increase	Decrease
			<i>Per cent</i>	<i>Per cent</i>
Requisitions received.....	6,063	6,040		0.37
Proposals for services, supplies, and equipment.....	1,904	1,810		4.9
Invitations to bid on services, supplies, and equipment.....	7,379	6,469		12.0
Orders issued.....	10,302	10,634	3.22	
Vouchers passed for settlement.....	8,203	9,562	16.0	
Letters emanating from this office.....	10,673	10,499		1.6
Invoices.....	2,779	3,037	9.28	

The above work necessitated 148 days 4 hours and 45 minutes of overtime work.

REAL ESTATE

The real-estate record for the department for the fiscal year 1926, covering leases, is not complete, as a number of leases have not yet been submitted by the bureaus. From the information now on hand it has been determined that there will be an increase of approximately \$2,413.50 over the fiscal year 1925, on the leases which have so far been cleared through this office, said increase being due principally to the need for greater space necessary to efficiently conduct the field business of the department.

Including the yearly increase of rentals since the organization of the Federal Real Estate Board in 1921, at which time a reduction in the department's rentals of \$20,000 was effected, due to the growth of the department's activities, the savings for the current fiscal year for the same activities over the expenditures for the fiscal year 1922 will be approximately \$8,962.50.

CONTRACTS AND ADJUSTMENTS

The interdepartmental board of contracts and adjustments has tentatively adopted and referred to the Director, Bureau of the Budget, the construction contract and supply contract has been practically completed but final recommendation on same is being held in abeyance pending action by the Bureau of the Budget on the construction contract form.

The board is now considering criticisms received on the proposed contract law and are revising same. It is believed that this law will be completed for a second consideration by the departments within the near future.

TRAFFIC OFFICE

The traffic office has continued during the past year to demonstrate its worth and justify its existence. Some of its outstanding

accomplishments consisted of savings by forwarding shipments via United States transports; consolidation of various less than carload shipments into carloads and securing special rates; obtaining contract rates from intercoastal lines and various carriers; having shipments from the Atlantic seaboard to the Pacific coast made subject to the general contract Government rate; obtaining reductions in carriers' bills through changes in classification; savings by purchasing f. o. b. point of origin, thereby obtaining land-grant deductions; consolidation of export shipments, and the storing of vessels and field trucks without cost. A detailed statement covering shipments during the fiscal year 1925 is shown in Table 13, page 69.

DEPARTMENT LIBRARY

The department library is the central depository where all books, periodicals, and printed matter are recorded. It is a clearing house by which the information is made readily accessible. The detail work is to collect, catalogue, and properly classify all material bearing on the work of the bureaus or offices to which it gives service. Books when not in use are on the library shelves, and when in use the library has a proper charge for them, showing where they may be found. Trade journals or official periodicals received in the library are recorded and routed to divisions interested.

The enlarged activities of the department have reacted on the library and the demands have increased accordingly. The following figures will give some idea of the year's accomplishments, but they necessarily can not show the efficient assistance rendered research workers or the splendid spirit which animated the service. Total number of books in the library on June 30, 1925, was over 117,000; total number of books and pamphlets added during the year, 7,850; 3,715 books were catalogued; 117,483 cards of new accessions were added to the catalogue; 6,473 books and pamphlets were collated and prepared for the bindery; 623 books were sent to the bindery; 2,013 books were discarded; 2,919 letters and post cards were written for books or in acknowledgment of their receipt. The circulation of books in the Commerce Building amounted to 17,717; 2,629 books were borrowed from the Library of Congress and other libraries; 1,825 trade, technical, and scientific periodicals, including 84 daily papers and 61 foreign gazettes, were currently received, recorded, and routed to 2,356 individuals or divisions. Approximately 1,000 research workers from other Government departments used the library.

The greatest care is practiced in the selection of books and an intelligent estimate is made of the economic value of each book as bearing on the work before it is added to the library; but in spite of this, one of the greatest handicaps to efficiency is the lack of adequate space, both for shelving, for working quarters, and for reference purposes. At present the assistants have to work at the side of the stack room and many unnecessary steps are taken in order that they may consult the catalogue and other tools on which their work depends. The reference room is crowded and the space for shelving wholly inadequate.

WORK OF THE SOLICITOR'S OFFICE

During the fiscal year ended June 30, 1925, 132 contracts, totaling \$1,203,407.12, together with 9 contracts of indeterminate amounts; 141 leases amounting to \$616,136.98; 26 revocable licenses amounting to \$5,373; 2 insurance policies amounting to \$355,500; 18 deeds involving the sum of \$386,749.74; 91 contract bonds amounting to \$542,811; 90 official bonds amounting to \$577,000 were examined (approved, disapproved, drafted, redrafted, or modified).

The number of legal opinions rendered, formal and informal (memorandum), totaled 140 (a great many verbal opinions of which no record is kept) were also rendered during the year; legislative matters handled which concern the Department of Commerce (drafting and redrafting of bills, reports relative thereto, etc.) numbered 5. Power-of-attorney cards, authorizing agents to execute official and contract bonds for surety companies, totaled 3,257. In addition, 10,494 miscellaneous matters, embracing everything submitted for the advice or suggestion of the solicitor, or for the formulation of departmental action, not included in the foregoing items, were handled by this office.

MISCELLANEOUS STATISTICS

TABLE 1.—Total appropriations, 1925

Bureau	Annual appropriation acts	Deficiency act	Executive order of May 17, 1925	Claims for damages	Allotments by other departments	Total
Office of the Secretary.....	\$524,380.00	-----	-----	-----	-----	\$524,380.00
Bureau of Foreign and Domestic Commerce.....	2,713,177.00	\$122,126.00	-----	-----	-----	2,835,303.00
Bureau of the Census.....	5,317,470.00	30,000.00	-----	-----	-----	5,347,470.00
Steamboat Inspection Service.....	884,870.00	165,160.00	-----	-----	-----	1,050,030.00
Bureau of Navigation.....	1,434,869.38	66,700.00	-----	-----	-----	501,569.38
Bureau of Standards.....	1,775,760.00	178,477.00	-----	-----	\$152,750.00	2,106,987.00
Coast and Geodetic Survey.....	2,217,900.00	152,944.00	-----	\$203.34	-----	2,371,847.34
Bureau of Lighthouses.....	8,238,706.00	1,199,680.00	-----	2,490.39	-----	9,490,870.39
Bureau of Fisheries.....	1,200,965.00	197,680.00	-----	-----	-----	1,398,645.00
Patent Office.....	-----	-----	\$855,245.69	-----	-----	855,245.69
Printing and Binding.....	475,000.00	100,000.00	370,366.64	-----	-----	945,366.64
Total.....	23,833,091.38	2,212,767.00	1,225,612.33	2,993.73	152,750.00	27,427,214.44

Bureau	Allotments to other departments	Transferred to retirement fund	Total transferred	Net amount available for expenditure by this department
Office of the Secretary.....	-----	\$4,131.21	\$4,131.21	\$520,248.79
Bureau of Foreign and Domestic Commerce.....	-----	40,419.36	40,419.36	2,794,883.64
Bureau of the Census.....	\$152,500.00	48,761.34	201,261.34	5,146,208.66
Steamboat Inspection Service.....	-----	21,743.00	21,743.00	1,028,287.00
Bureau of Navigation.....	-----	9,315.42	9,315.42	492,253.96
Bureau of Standards.....	-----	55,308.00	55,308.00	2,051,679.00
Coast and Geodetic Survey.....	5,868.00	12,478.03	18,336.03	2,353,011.31
Bureau of Lighthouses.....	5,565.00	11,715.51	17,280.51	9,473,589.88
Bureau of Fisheries.....	-----	13,300.00	13,300.00	1,385,345.00
Patent Office.....	-----	125.00	125.00	855,120.69
Printing and Binding.....	-----	-----	-----	945,366.64
Total.....	163,923.00	217,296.87	381,219.87	27,045,994.57

¹ Includes \$2,186.38 permanent indefinite appropriations.

TABLE 2.—Itemized disbursements, 1925

BY DISBURSING CLERK, DEPARTMENT OF COMMERCE

Office of the Secretary:

Contingent expenses, Department of Commerce, 1923.....	\$972.93
Contingent expenses, Department of Commerce, 1924.....	44,062.23
Contingent expenses, Department of Commerce, 1925.....	185,676.59
Rent, Department of Commerce, 1924.....	11,241.66
Rent, Department of Commerce, 1925.....	62,016.63
Salaries, office of the Secretary, 1924.....	6,758.92
Salaries, office of the Secretary, 1925.....	205,824.11
Salaries, office of the Secretary, 1925-26.....	850.00
Total	517,403.07

Bureau of Foreign and Domestic Commerce:

Commercial attachés, 1923.....	1.00
Commercial attachés, 1924.....	11,266.71
Commercial attachés, 1925.....	16,315.90
Compiling foreign trade statistics, 1924.....	15,951.95
Compiling foreign trade statistics, 1925.....	298,017.12
Directory of foreign buyers, 1924.....	265.22
Directory of foreign buyers, 1925.....	8,011.60
District and cooperative office service, 1924.....	9,947.74
District and cooperative office service, 1925.....	185,757.96
Enforcement of China trade act, 1924.....	725.95
Enforcement of China trade act, 1925.....	13,409.93
Export industries, 1924.....	21,218.44
Export industries, 1925.....	533,763.74
Investigating sources of crude rubber, 1923-24.....	11,092.02
Investigating sources of crude rubber, 1925.....	65,927.45
Investigation of foreign trade restrictions, 1924.....	799.17
Investigation of foreign trade restrictions, 1925.....	22,854.93
Promoting commerce, Department of Commerce, 1923.....	.91
Promoting commerce, Department of Commerce, 1924.....	14,594.32
Promoting commerce, Department of Commerce, 1925.....	57,294.84
Promoting commerce, in the Far East, 1924.....	3,893.70
Promoting commerce, in the Far East, 1925.....	106,730.43
Promoting commerce, South and Central America, 1924.....	7,762.68
Promoting commerce, South and Central America, 1925.....	123,817.28
Raw material investigations, 1924.....	3,051.42
Raw material investigations, 1925.....	37,330.55
Salaries, Foreign and Domestic Commerce, 1924.....	9,420.90
Salaries, Foreign and Domestic Commerce, 1925.....	247,427.12
Transportation of families and effects of officers and employees, 1925.....	50.30
Total	1,826,701.28

Bureau of Standards:

Advisory committee for Aeronautics (transfer to Bureau of Standards, act of Jan. 5, 1923), 1924.....	693.47
Advisory Committee for Aeronautics (transfer to Bureau of Standards, act of May 28, 1924), 1925.....	26,532.07
Air Service, Army (War transfer to Bureau of Standards, act of May 21, 1920), 1924.....	1,896.39
Air Service, Army (War transfer to Bureau of Standards, act of Jan. 5, 1923), 1924.....	1,529.46
Air Service, Army (War transfer to Bureau of Standards, act of May 21, 1920), 1925.....	968.00
Air Service, Army (War transfer to Bureau of Standards, act of May 28, 1924), 1925.....	5,087.51
Armament of fortifications (War transfer to Bureau of Standards, act of May 28, 1924), 1925.....	847.18
Automatic rifles (War transfer), 1923-24.....	380.25

Bureau of Standards—Continued.

Automatic rifles (War transfer to Bureau of Standards, act of May 21, 1920), 1924-25	\$546.00
Automotive power plants, 1924	2,069.70
Aviation, Navy (Navy transfer to Commerce, act of May 21, 1920), 1923	793.55
Aviation, Navy (Navy transfer to Bureau of Standards, act of May 21, 1920), 1924	10,818.05
Aviation, Navy (Navy transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	795.28
Aviation, Navy (Navy transfer to Bureau of Standards, act of May 28, 1924), 1925	28,674.16
Clothing and equipage (War transfer to Commerce, act of May 21, 1920), 1923	2,244.76
Color standardization, 1924	989.97
Color standardization, 1925	8,416.85
Conference on oil pollution of navigable waters (State transfer to Bureau of Standards, act of Mar. 4, 1925), 1925-26	113.75
Construction and repair, Bureau of Construction and Repair (Navy transfer), 1923	485.22
Construction and repair, Bureau of Construction and Repair (Navy transfer to Bureau of Standards, act of May 21, 1920), 1925	1,809.58
Construction and repair, Bureau of Construction and Repair (Navy transfer to Bureau of Standards, act of May 28, 1924), 1925	8,708.20
Engineering, Bureau of Engineering (Navy transfer to Commerce, act of May 21, 1920), 1923	119.14
Engineering, Bureau of Engineering (Navy transfer to Commerce, act of Jan. 5, 1923), 1924	4.66
Equipment, 1923	558.91
Equipment, 1924	14,995.25
Equipment, 1925	54,615.55
Experiments, Ordnance (Navy transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	56.87
Export industries, Department of Commerce (transfer to Bureau of Standards, act of May 28, 1924), 1925	4,469.08
Field artillery, armament (War transfer to Bureau of Standards, act of May 21, 1920), 1924	823.87
Field artillery, armament (War transfer to Bureau of Standards, act of May 28, 1924), 1925	922.84
Gauge standardization, 1924	2,429.65
Gauge standardization, 1925	33,350.15
General expenses, Bureau of Entomology (Agriculture transfer to Bureau of Standards, act of May 28, 1924), 1925	4,367.41
General expenses, Lighthouse Service (transfer to Bureau of Standards, act of May 28, 1924), 1925	1,921.37
General expenses, Bureau of Standards, 1923	60.66
General expenses, Bureau of Standards, 1924	9,326.14
General expenses, Bureau of Standards, 1925	22,450.32
High-temperature investigations, 1924	879.22
High-temperature investigations, 1925	9,069.13
Improvement and care of grounds, 1924	1,002.25
Improvement and care of grounds, 1925	10,623.26
Incidental expenses of the Army (War transfer to Commerce, act of May 21, 1920), 1923	12,352.92
Incidental expenses of the Army (War transfer to Bureau of Standards, act of May 28, 1924), 1925	8,645.26
Industrial research, 1923	10,029.27
Industrial research, 1924	10,353.05
Industrial research, 1925	158,079.40
Investigation of automotive engines, 1925	30,226.58
Investigation of clay products, 1924	1,979.85
Investigation of clay products, 1925	27,211.78
Investigation of fire-resisting properties, 1924	946.45
Investigation of fire-resisting properties, 1925	26,004.62

Bureau of Standards—Continued.

Investigation of mine scales and cars, 1924	\$194.89
Investigation of mine scales and cars, 1925	11,552.07
Investigation of optical glass, 1924	953.77
Investigation of optical glass, 1925	22,457.71
Investigation of public utility standards, 1924	8,955.15
Investigation of public utility standards, 1925	91,155.66
Investigation of radioactive substances, 1924	1,708.52
Investigation of radioactive substances, 1925	10,014.84
Investigation of textiles, etc., 1924	3,160.81
Investigation of textiles, etc., 1925	23,563.38
Land, Bureau of Standards, 1925-26	173,117.00
Manufacture of arms (War transfer to Bureau of Standards, act of May 28, 1924), 1924-25	759.80
Metallurgical research, 1924	3,656.69
Metallurgical research, 1925	37,522.67
Mineral mining investigations, Bureau of Mines (Interior transfer to Bureau of Standards, act of May 28, 1924), 1925	4,245.65
Ordnance and ordnance stores, Bureau of Ordnance (Navy transfer to Commerce, act of May 21, 1920), 1923	21.20
Ordnance and ordnance stores, Bureau of Ordnance (Navy transfer to Commerce, Act of May 21, 1920), 1924	1,179.93
Ordnance and ordnance stores, Bureau of Ordnance (Navy transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	1,207.10
Ordnance and ordnance stores, Bureau of Ordnance (Navy transfer to Bureau of Standards, act of May 21, 1920), 1925	7,969.85
Ordnance stores, ammunition (War transfer to Bureau of Standards, act of May 21, 1920), 1923-24	585.17
Ordnance stores, ammunition (War transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	129.19
Ordnance stores, ammunition (War transfer to Bureau of Standards, act of May 28, 1924), 1925-26	286.00
Party expenses, Coast and Geodetic Survey (transfer to Bureau of Standards, act of May 21, 1920), 1923	1,211.87
Party expenses, Coast and Geodetic Survey (transfer to Bureau of Standards, act of May 21, 1920), 1924	1,753.38
Party expenses, Coast and Geodetic Survey (transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	369.28
Radio research, 1924	3,293.38
Radio research, 1925	42,300.10
Replacement of altitude chambers, 1924	57,773.42
Rope investigation, 1924	5,252.16
Rope investigation, 1925	6,968.20
Salaries, 1924	15,096.08
Salaries, 1925	464,020.87
Signal Service of the Army (War transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	33.00
Signal Service of the Army (War transfer to Bureau of Standards, act of May 28, 1924), 1925	3,381.40
Sound investigation, 1924	266.67
Sound investigation, 1925	5,311.90
Standardization of equipment, 1923	3,583.26
Standardization of equipment, 1924	5,198.64
Standardization of equipment, 1925	94,599.22
Standardizing mechanical appliances, 1924	2,895.26
Standardizing mechanical appliances, 1925	27,625.93
Standard materials, 1924	1,209.80
Standard materials, 1925	9,203.38
Subsistence of the Army (War transfer to Commerce, act of May 21, 1920), 1923	4,733.29
Sugar standardization, 1924	4,307.25
Sugar standardization, 1925	36,539.81
Tanks (War transfer to Bureau of Standards, act of May 21, 1920), 1923-24	1,146.07

Bureau of Standards—Continued.

Testing machines, 1924	\$2,789.77
Testing machines, 1925	32,824.11
Testing miscellaneous materials, 1924	2,122.79
Testing miscellaneous materials, 1925	41,173.86
Testing railroad scales, 1924	3,354.90
Testing railroad scales, 1925	33,778.53
Testing structural materials, 1924	19,273.00
Testing structural materials, 1925	219,205.44
Washington-Alaska military cable and telegraph system (War transfer to Bureau of Standards, act of May 28, 1924), 1925-26	382.22
Total	<u>2,119,649.60</u>

Steamboat Inspection Service:

Clerk hire, 1924	9,221.83
Clerk hire, 1925	124,975.23
Contingent expenses, 1923	9.95
Contingent expenses, 1924	13,175.21
Contingent expenses, 1925	81,210.15
Salaries, office of Supervising Inspector General, 1924	912.77
Salaries, office of Supervising Inspector General, 1925	26,015.36
Salaries, Steamboat Inspection Service, 1923	108.20
Salaries, Steamboat Inspection Service, 1924	48,647.20
Salaries, Steamboat Inspection Service, 1925	649,570.86
Total	<u>953,846.76</u>

Bureau of Navigation:

Admeasurement of vessels, 1924	91.81
Admeasurement of vessels, 1925	3,616.11
Clerk hire, shipping service, 1924	5,575.32
Clerk hire, shipping service, 1925	78,141.74
Contingent expenses, shipping service, 1924	1,037.61
Contingent expenses, shipping service, 1925	9,091.30
Enforcement of navigation laws, 1924	15,656.85
Enforcement of navigation laws, 1925	72,929.76
Enforcement of wireless communication laws, 1924	8,676.28
Enforcement of wireless communication laws, 1925	176,995.96
Instruments for counting passengers, 1925	15.50
Preventing overcrowding of passenger vessels, 1924	184.65
Preventing overcrowding of passenger vessels, 1925	11,976.26
Salaries, Bureau of Navigation, 1924	1,742.12
Salaries, Bureau of Navigation, 1925	51,497.37
Salaries, shipping service, 1924	2,484.69
Salaries, shipping service, 1925	33,106.08
Total	<u>472,819.41</u>

Bureau of Fisheries:

Fisheries of Alaska, 1924-25	7,309.01
Fish-rescue station, Mississippi River, 1923-24	1,162.08
Fish-rescue station, Mississippi River, 1925	27,982.70
Investigating damages to fisheries	872.18
Miscellaneous expenses, 1923	135.85
Miscellaneous expenses, 1923-24	2,133.96
Miscellaneous expenses, 1924	40,154.97
Miscellaneous expenses, 1924-25	3,151.78
Miscellaneous expenses, 1925	400,403.72
Pay, officers and crew of vessels, Alaska fisheries service, 1924	1,015.00
Pay, officers and crew of vessels, Alaska fisheries service, 1925	12,793.00
Protecting seal and salmon fisheries of Alaska, 1923-24	2,400.81
Protecting seal and salmon fisheries of Alaska, 1924	3,170.42
Protecting seal and salmon fisheries of Alaska, 1924-25	97,979.92

Bureau of Fisheries—Continued.

Protecting seal and salmon fisheries of Alaska, 1925-----	\$34,400.92
Salaries, 1924-----	29,477.51
Salaries, 1925-----	535,202.25
Total-----	<u>1,199,746.08</u>

Bureau of the Census:

Census of agriculture, 1925-26-----	665,034.71
Collecting statistics, 1923-----	40.25
Collecting statistics, 1924-----	88,392.83
Collecting statistics, 1925-----	760,337.84
Salaries, 1924-----	32,070.23
Salaries, 1925-----	904,257.42
Tabulating machines, 1923-----	4.68
Tabulating machines, 1924-----	1,516.92
Tabulating machines, 1925-----	35,842.49
Total-----	<u>2,487,497.37</u>

Bureau of Lighthouses:

Aids to navigation, Lighthouse Service-----	3,164.94
Point Vincente Light Station, Calif-----	205.73
Tender for third lighthouse district-----	45,411.72
Vessels for Lighthouse Service-----	60,691.00
General expenses, Lighthouse Service, 1923-----	116.24
General expenses, Lighthouse Service, 1924-----	33,496.31
General expenses, Lighthouse Service, 1925-----	25,358.81
Salaries, Bureau of Lighthouses, 1924-----	2,703.40
Salaries, Bureau of Lighthouses, 1925-----	81,176.48
Salaries, Lighthouse Service, 1924-----	325.73
Salaries, Lighthouse Service, 1925-----	14,047.95
Total-----	<u>266,698.31</u>

Patent Office:

Additional employees, 1924-25-----	40,862.16
Contingent expenses, Patent Office, 1925-----	1,816.81
Furniture and filing cases, 1925-----	3,006.00
Photolithographing, 1925-----	49,273.00
Printing and binding, Patent Office, 1925-----	273,674.79
Public use of inventions and defending suits, 1925-----	51.67
Rent and storage of Patent Office models, 1925-----	300.00
Scientific library, 1923-----	31.65
Scientific library, 1924-----	127.25
Scientific library, 1925-----	1,390.42
Salaries, 1925-----	474,534.94
Stationery, Patent Office, 1925-----	1,127.06
Total-----	<u>846,195.75</u>

Miscellaneous:

Increase of compensation, Department of Commerce, 1923--	11.33
Increase of compensation, Department of Commerce, 1924--	44,105.05
Printing and binding, Department of Commerce, 1923-----	13,658.37
Printing and binding, Department of Commerce, 1924-----	161,080.05
Printing and binding, Department of Commerce, 1925-----	358,740.76
Total-----	<u>577,595.56</u>
Grand total-----	<u>11,268,153.19</u>

BY DISBURSING OFFICERS, LIGHTHOUSE SERVICE

Aids to navigation, Alaska-----	\$3,410.93
Aids to navigation, Calumet Harbor, Ill-----	554.88

Aids to navigation, Conneaut Harbor, Ohio.....	\$1,866.22
Aids to navigation, Coquille River, Oreg.....	713.69
Aids to navigation, Chesapeake Bay, Md. and Va.....	907.52
Aids to navigation, Delaware Bay Entrance.....	18,194.83
Aids to navigation, Florida coasts.....	11,331.98
Aids to navigation, Lighthouse Service.....	309,467.33
Aids to navigation, Raritan Bay and connected waters, N. Y. and N. J.....	77.50
Aids to navigation, St. Johns River, Fla.....	2,590.89
Detroit Lighthouse Depot, Mich.....	350.06
Detroit River lights, Mich.....	6,663.46
Cape Charles Light Vessel, Va.....	40,627.57
Point Borinquen Light Station, P. R.....	371.59
Point Vincente Light Station, Calif.....	56,244.30
Sabine Pass Jetty Light Station, Tex.....	7,943.44
Sand Island Light Station, Ala.....	634.44
Spectacle Reef Light Station, Mich.....	5,531.43
Repairing and rebuilding aids to navigation, Atlantic coast.....	1,522.50
Repairing and rebuilding aids to navigation, Gulf of Mexico.....	4,835.03
Repairing and rebuilding aids to navigation, seventh and eighth lighthouse districts.....	5,642.20
Repairing and rebuilding aids to navigation, seventh lighthouse district, 1922-23.....	5,246.80
Riprap protection for light stations, third lighthouse district.....	4,291.07
Tender for third lighthouse district.....	1,677.49
Vessels for Lighthouse Service.....	3,490.94
General expenses, Lighthouse Service, 1923.....	1,397.79
General expenses, Lighthouse Service, 1924.....	487,553.79
General expenses, Lighthouse Service, 1925.....	3,606,700.76
Salaries, keepers of lighthouses, 1923.....	15.17
Salaries, keepers of lighthouses, 1924.....	34,648.99
Salaries, keepers of lighthouses, 1925.....	1,632,370.06
Salaries, lighthouse vessels, 1924.....	51,397.59
Salaries, lighthouse vessels, 1925.....	2,138,189.84
Salaries, Lighthouse Service, 1924.....	4,261.99
Salaries, Lighthouse Service, 1925.....	500,888.81
Retired pay, Lighthouse Service, 1924.....	2,723.60
Retired pay, Lighthouse Service, 1925.....	119,970.52
Increase of compensation, Department of Commerce, 1923.....	4.66
Increase of compensation, Department of Commerce, 1924.....	27,829.92
Total.....	9,102,141.58

BY DISBURSING AGENT, COAST AND GEODETIC SURVEY

General expenses, Coast and Geodetic Survey, 1923.....	\$52.56
General expenses, Coast and Geodetic Survey, 1924.....	7,882.86
General expenses, Coast and Geodetic Survey, 1925.....	57,387.60
Maintenance, Bureau of Yards and Docks (Navy transfer to Commerce), 1924.....	572.17
Party expenses, Coast and Geodetic Survey, 1923.....	38.20
Party expenses, Coast and Geodetic Survey, 1924.....	111,850.58
Party expenses, Coast and Geodetic Survey, 1925.....	441,664.23
Pay and allowances, commissioned officers, Coast and Geodetic Survey, 1923.....	200.40
Pay and allowances, commissioned officers, Coast and Geodetic Survey, 1924.....	49,186.04
Pay and allowances, commissioned officers, Coast and Geodetic Survey, 1925.....	413,902.05
Pay, etc., officers and men, vessels, Coast Survey, 1923.....	123.18
Pay, etc., officers and men, vessels, Coast Survey, 1924.....	98,571.28
Pay, etc., officers and men, vessels, Coast Survey, 1925.....	501,603.69
Repairs of vessels, Coast Survey, 1924.....	3,983.78
Repairs of vessels, Coast Survey, 1925.....	51,296.82
Salaries, Coast and Geodetic Survey, 1924.....	69.34

Salaries, Coast and Geodetic Survey, 1925-----	\$377,768.51
Increase of compensation, Department of Commerce, 1924-----	17,564.73
Total -----	2,133,718.02

BY SPECIAL DISBURSING AGENTS, BUREAU OF THE CENSUS

Census of agriculture, Bureau of the Census, 1925-26-----	\$2,155,406.97
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BY COMMERCIAL AGENTS OF THE DEPARTMENT INVESTIGATING TRADE CONDITIONS
ABROAD

Commercial attachés, Department of Commerce, 1925-----	\$217,882.43
Contingent expenses, Department of Commerce, 1925-----	3,288.72
District and cooperative office service, 1925-----	1,945.86
Enforcement of the China trade act, 1925-----	12,620.66
Export industries, Department of Commerce, 1925-----	15,859.27
Investigating sources of crude rubber, 1925-----	19,454.74
Promoting commerce, Department of Commerce, 1925-----	306,432.93
Promoting commerce in the Far East, 1925-----	104,478.58
Promoting commerce, South and Central America, 1925-----	95,561.92
Salaries, Bureau of Foreign and Domestic Commerce, 1925-----	625.00
Transportation of families and effects of officers and employees, 1925-----	12,584.37
Transportation and interment of remains of officers and em- ployees, 1925-----	46.07
Total -----	790,744.55

BY SPECIAL DISBURSING AGENTS, BUREAU OF FISHERIES

Miscellaneous expenses, Bureau of Fisheries, 1924-----	\$2,078.62
Miscellaneous expenses, Bureau of Fisheries, 1925-----	14,885.88
Fisheries of Alaska, 1924-25-----	9,535.57
Pay, officers and crew of vessels, Alaska Fisheries Service, 1924-----	2,159.99
Pay, officers and crew of vessels, Alaska Fisheries Service, 1925-----	25,473.34
Protecting seal and salmon fisheries of Alaska, 1924-----	5,849.93
Protecting seal and salmon fisheries of Alaska, 1925-----	69,920.04
Increase of compensation, Department of Commerce, 1924-----	533.34
Total -----	130,436.71

TABLE 3.—*Treasury warrants, 1925*

Office of the Secretary:	
Contingent expenses, Department of Commerce, 1924-----	\$1,510.16
Contingent expenses, Department of Commerce, 1925-----	3,099.96
Total -----	4,610.12
Bureau of Foreign and Domestic Commerce:	
Commercial attachés, 1923-----	80.16
Commercial attachés, 1924-----	2,312.29
Commercial attachés, 1925-----	3,605.25
Compiling foreign trade statistics, 1924-----	163.99
Compiling foreign trade statistics, 1925-----	363.26
Directory of foreign buyers, 1925-----	162.62
District and cooperative office service, 1924-----	1,604.84
District and cooperative office service, 1925-----	3,399.74
Enforcement of China trade act, 1924-----	489.19
Enforcement of China trade act, 1925-----	1,576.30
Export industries, 1924-----	5,929.48
Export industries, 1925-----	15,584.19
Investigating sources of crude rubber, 1923-24-----	6,702.23
Investigating sources of crude rubber, 1925-----	2,269.94

Bureau of Foreign and Domestic Commerce—Continued.

Investigation of foreign trade restrictions, 1925	\$529.71
Promoting commerce, Department of Commerce, 1923	12.50
Promoting commerce, Department of Commerce, 1924	4,036.03
Promoting commerce, Department of Commerce, 1925	10,577.06
Promoting commerce in the Far East, 1923	70.40
Promoting commerce in the Far East, 1924	1,634.69
Promoting commerce in the Far East, 1925	2,906.63
Promoting commerce, South and Central America, 1924	561.42
Promoting commerce, South and Central America, 1925	4,123.07
Raw material investigations, 1924	5,413.94
Raw material investigations, 1925	1,568.40
Transportation of families and effects of officers and employees, 1924	504.56
Transportation of families and effects of officers and employees, 1925	10,867.27
Certified claims—	
Promoting commerce, Department of Commerce, 1922	10.91
Promoting commerce, South and Central America, 1921	49.38
Total	<u>87,109.45</u>

Bureau of Standards:

Advisory Committee for Aeronautics (transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	131.60
Advisory Committee for Aeronautics (transfer to Bureau of Standards, act of May 28, 1924), 1925	74.56
Air Service, Army (War transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	8.25
Automotive power plants, 1924	72.92
Aviation, Navy (Navy transfer to Bureau of Standards, act of May 21, 1920), 1924	65.66
Aviation, Navy (Navy transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	87.86
Aviation, Navy (Navy transfer to Bureau of Standards, act of May 28, 1924), 1925	36.32
Color standardization, 1925	45.86
Equipment, 1923	110.00
Equipment, 1924	5,034.50
Equipment, 1925	29.40
Gauge standardization, 1924	179.24
Gauge standardization, 1925	124.21
General expenses, Bureau of Standards, 1923	34.24
General expenses, Bureau of Standards, 1924	3,010.43
General expenses, Bureau of Standards, 1925	3,266.97
General expenses, Bureau of Entomology (Agriculture transfer to Bureau of Standards, act of May 28, 1924), 1925	102.34
General expenses, Lighthouse Service (transfer to Bureau of Standards, act of May 28, 1924), 1925	5.63
High-temperature investigations, 1925	93.27
Incidental expenses of the Army (War transfer to Commerce, act of May 21, 1920), 1923	197.06
Incidental expenses of the Army (War transfer to Bureau of Standards, act of May 28, 1924), 1925	23.78
Industrial research, 1923	426.93
Industrial research, 1924	1,184.39
Industrial research, 1925	1,859.30
Investigation of automotive engines, 1925	751.88
Investigation of clay products, 1924	50.28
Investigation of clay products, 1925	217.20
Investigation of fire-resisting properties, 1924	3.75
Investigation of fire-resisting properties, 1925	131.41
Investigation of mine scales and cars, 1924	181.14
Investigation of mine scales and cars, 1925	150.43
Investigation of optical glass, 1925	62.16
Investigation of public-utility standards, 1923	12.73
Investigation of public-utility standards, 1924	1,337.21

Bureau of Standards—Continued.

Investigation of public-utility standards, 1925	\$1, 134. 91
Investigation of radioactive substances, 1924	13. 95
Investigation of radioactive substances, 1925	69. 64
Investigation of textiles, etc., 1924	68. 10
Investigation of textiles, etc., 1925	211. 55
Metallurgical research, 1924	160. 31
Metallurgical research, 1925	518. 62
Ordnance and ordnance stores, Bureau of Ordnance (Navy transfer to Commerce, act of May 21, 1920), 1924	272. 70
Ordnance stores, ammunition (War transfer to Bureau of Standards, act of May 21, 1920), 1923-24	12. 27
Party expenses, Coast and Geodetic Survey (transfer to Bureau of Standards, act of May 21, 1920), 1924	55. 59
Party expenses, Coast and Geodetic Survey (transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	243. 86
Radio research, 1924	44. 70
Radio research, 1925	333. 67
Replacement of altitude chambers, 1924	2, 428. 76
Rope investigation, 1924	68. 28
Signal Service of the Army (War transfer to Bureau of Standards, act of Jan. 5, 1923), 1924	13. 77
Standardization of equipment, 1923	62. 00
Standardization of equipment, 1924	1, 495. 89
Standardization of equipment, 1925	2, 813. 58
Standardizing mechanical appliances, 1924	155. 93
Standardizing mechanical appliances, 1925	47. 74
Standard materials, 1924	4. 63
Standard materials, 1925	20. 93
Testing machines, 1924	15. 00
Testing machines, 1925	121. 17
Testing miscellaneous materials, 1924	124. 23
Testing miscellaneous materials, 1925	230. 79
Testing railroad scales, 1924	617. 70
Testing railroad scales, 1925	2, 431. 45
Testing structural materials, 1924	2, 397. 33
Testing structural materials, 1925	3, 639. 83
Washington-Alaska military cable and telegraph system (War, transfer to Bureau of Standards, act of May 28, 1924), 1925-26	38. 85
Certified claims—	
Industrial research, 1922	517. 29
Standardizing mechanical appliances, 1921	263. 00
Total	39, 750. 93

Bureau of Navigation:

Admeasurement of vessels, 1924	20. 15
Admeasurement of vessels, 1925	500. 57
Clerk hire, shipping service, 1925	8. 12
Contingent expenses, shipping service, 1924	10. 87
Contingent expenses, shipping service, 1925	11. 50
Enforcement of navigation laws, 1924	292. 55
Enforcement of navigation laws, 1925	458. 70
Enforcement of wireless communication laws, 1924	2, 215. 03
Enforcement of wireless communication laws, 1925	5, 678. 90
Preventing overcrowding of passenger vessels, 1924	56. 30
Preventing overcrowding of passenger vessels, 1925	911. 92
Refunding moneys erroneously received and covered into the Treasury	871. 90
Refunding penalties or charges erroneously exacted	1, 314. 48
Certified claims—	
Enforcement of navigation laws, 1922	2. 55
Preventing overcrowding of passenger vessels, 1920	1. 39
Total	12, 354. 93

Steamboat Inspection Service:

Contingent expenses, 1923	\$52.78
Contingent expenses, 1924	7,417.91
Contingent expenses, 1925	23,212.60
Total	30,683.29

Bureau of Fisheries:

Fish-rescue station, Mississippi River, 1925	10.60
Fisheries of Alaska, 1924-25	669.53
Investigating damages to fisheries	293.51
Miscellaneous expenses, 1923	4.70
Miscellaneous expenses, 1924	15,661.08
Miscellaneous expenses, 1925	40,789.41
Miscellaneous expenses, 1923-24	2,758.37
Protecting seal and salmon fisheries of Alaska, 1923	7.60
Protecting seal and salmon fisheries of Alaska, 1924	1,837.55
Protecting seal and salmon fisheries of Alaska, 1925	6,788.34
Protecting seal and salmon fisheries of Alaska, 1923-24	239.89
Protecting seal and salmon fisheries of Alaska, 1924-25	293.63
Certified claims—	
Miscellaneous expenses, 1921	.45
Miscellaneous expenses, 1922	70.28
Total	69,424.94

Bureau of the Census:

Census of agriculture, 1925-26	6,561.63
Collecting statistics, 1924	5,478.51
Collecting statistics, 1925	6,459.97
Tabulating machines, 1924	1.89
Tabulating machines, 1925	2.24
Certified claims—Expenses of the Fourteenth Census, 1920-1922	799.39
Total	19,303.63

Coast and Geodetic Survey:

General expenses, 1923	23.78
General expenses, 1924	220.34
General expenses, 1925	632.31
Party expenses, 1923	60.69
Party expenses, 1924	10,934.12
Party expenses, 1925	17,356.34
Pay and allowances, commissioned officers, 1923	53.33
Pay, etc., officers and men, vessels, Coast Survey, 1924	342.17
Pay, etc., officers and men, vessels, Coast Survey, 1925	1,138.16
Repairs of vessels, Coast and Geodetic Survey, 1924	41.11
Repairs of vessels, Coast and Geodetic Survey, 1925	4,531.98
Certified Claims—	
Party expenses, 1922	381.17
Pay and allowances, commissioned officers, 1921	77.03
Pay and allowances, commissioned officers, 1922	24.00
Total	35,816.53

Bureau of Lighthouses:

Aids to navigation, Alaska	16.06
Aids to navigation, Delaware Bay entrance	285.27
Aids to navigation, Florida coast	1,130.41
Aids to navigation, Coquille River, Oreg	23.85
Aids to navigation, Pearl Harbor, Hawaii	.82
Aids to navigation, St. Johns River, Fla	264.55
Aids to navigation, Lighthouse Service	9,904.37

Bureau of Lighthouses—Continued.

Detroit River lights	\$17. 89
Point Borinquen Light Station, P. R.	12. 87
Point Vincente Light Station, Calif.	103. 67
Sabine Pass Jetty Light Station, Tex.	75. 76
Spectacle Reef Light Station, Mich.	10. 28
Cape Charles Light Vessel, Va.	109. 96
Repairing and rebuilding aids to navigation, Gulf of Mexico	26. 10
Repairing and rebuilding aids to navigation, seventh and eighth lighthouse districts	494. 68
Tender for third lighthouse district	77. 14
Vessels for Lighthouse Service	36, 064. 35
General expenses, Lighthouse Service, 1923	977. 40
General expenses, Lighthouse Service, 1924	43, 467. 50
General expenses, Lighthouse Service, 1925	51, 116. 85
Salaries, Lighthouse Service, 1923	72. 15
Salaries, lighthouse vessels, 1924	7. 39
Salaries, lighthouse vessels, 1925	137. 64
Certified claims—General expenses, Lighthouse Service, 1922	75. 79
Total	144, 472. 75

Patent Office:

Public use of inventions and defending suits, 1925	90. 58
Salaries, Patent Office, 1925	15. 11
Scientific library, 1924	17. 50
Total	123. 19

Miscellaneous:

Increase of compensation Department of Commerce, 1923	8. 00
Judgments, United States courts, Bureau of Fisheries	7, 578. 90
Claims for damages, Coast and Geodetic Survey	487. 39
Claims for damages, Bureau of Lighthouses	2, 347. 77
Total	10, 422. 06
Grand total	454, 071. 82

TABLE 4.—Expenditures, 1925

Bureau	By disbursing clerk of the department	By special disbursing agents of department	By General Accounting Office	Total
Office of the Secretary	\$538, 006. 69		\$4, 610. 12	\$542, 616. 81
Bureau of the Census	2, 641, 131. 88	\$2, 155, 406. 97	19, 303. 63	4, 815, 842. 48
Coast and Geodetic Survey	41, 350. 92	2, 133, 718. 02	36, 308. 92	2, 211, 372. 86
Bureau of Fisheries	1, 223, 060. 59	130, 436. 71	77, 003. 84	1, 430, 501. 14
Bureau of Foreign and Domestic Commerce	2, 029, 303. 71	790, 744. 55	87, 109. 45	2, 907, 157. 71
Bureau of Lighthouses	292, 317. 58	9, 102, 141. 58	146, 828. 52	9, 541, 287. 68
Bureau of Navigation	510, 677. 56		12, 354. 93	523, 032. 49
Bureau of Standards	2, 172, 770. 73		39, 750. 93	2, 212, 521. 66
Steamboat Inspection Service	973, 337. 78		30, 683. 29	1, 004, 021. 07
Patent Office	846, 195. 75		123. 19	846, 318. 94
Total	11, 268, 153. 19	14, 312, 447. 83	454, 071. 82	26, 034, 672. 84

TABLE 5.—Miscellaneous receipts, 1925

Coast and Geodetic Survey: Sale of charts, publications, old property, etc.	\$50, 962. 22
Bureau of the Census: Sale of publications, etc.	522. 00
Bureau of Fisheries:	
Sale of fur-seal skins	208, 157. 42
Sale of fox skins	128, 045. 06

Bureau of Fisheries—Continued.	
Sale of otter skins	\$969.41
Sale of live foxes	8,160.00
Meals furnished employees at isolated stations	2,583.42
Sale of seal oil	210.36
Sale of old property, etc.	4,615.25
Bureau of Standards:	
Sale of waste paper	131.96
Sale of old property, etc.	254.32
Test fees	98,583.47
Steamboat Inspection Service: Sale of old property	78.19
Bureau of Lighthouses:	
Sale of old property, etc.	123,337.39
Reimbursement for loss and damage to Government property	5,803.94
Sale of empty oil cans	322.16
Reimbursements by private concerns for work done	5,351.77
Rentals	9,125.23
Miscellaneous refunds	324.05
Bureau of Foreign and Domestic Commerce:	
Photostatic work done	40.87
Registration fees, etc., China trade act	600.00
Miscellaneous refunds	758.05
Office of the Secretary:	
Reimbursement for damage to Government property	14.50
Fees for certificates as to authenticity of signatures of the Commissioner of Patents as provided for in 37 Stat. 497	26.75
Bureau of Navigation:	
Tonnage duties	1,813,755.66
Navigation fees	216,878.77
Navigation fines	61,628.34
Reimbursement for damage to Government property	2.38
Patent Office: Patent fees, etc.	881,514.21
Total	3,622,757.15

TABLE 6.—Unexpended balances, 1925

Salaries, Office of the Secretary of Commerce, 1922	\$6.81
Salaries, Office of the Secretary of Commerce, 1923	5,882.79
Increase of compensation, Department of Commerce, 1919	.16
Increase of compensation, Department of Commerce, 1920	2.24
Increase of compensation, Department of Commerce, 1922	26.00
Increase of compensation, Department of Commerce, 1923	52,252.98
Contingent expenses, Department of Commerce, 1915	.20
Contingent expenses, Department of Commerce, 1916	.45
Contingent expenses, Department of Commerce, 1923	1,180.47
Printing and binding, Department of Commerce, 1923	6,960.23
Salaries, Bureau of Census, 1923	21,032.51
Collecting statistics, Bureau of Census, 1915	1.00
Collecting Statistics, Bureau of Census, 1923	110,585.97
Expenses of the Fourteenth Census, 1920-1922	.50
Tabulating machines, Bureau of the Census, 1923	1,309.29
Salaries, Bureau of Foreign and Domestic Commerce, 1923	6,362.71
Commercial attachés, Department of Commerce, 1919	62.40
Commercial attachés, Department of Commerce, 1920	835.19
Commercial attachés, Department of Commerce, 1921	19.60
Commercial attachés, Department of Commerce, 1922	352.19
Commercial attachés, Department of Commerce, 1923	220.68
Compiling foreign trade statistics, Department of Commerce, 1923	3,146.24
Enforcement of China trade act, 1923	5,347.60
Export industries, Department of Commerce, 1923	9,385.72
Promoting commerce, Department of Commerce, 1914	13.40
Promoting commerce, Department of Commerce, 1918	4.17
Promoting commerce, Department of Commerce, 1919	125.00

Promoting commerce, Department of Commerce, 1920-----	\$518.98
Promoting commerce, Department of Commerce, 1921-----	3,421.35
Promoting commerce, Department of Commerce, 1922-----	791.82
Promoting commerce, Department of Commerce, 1923-----	5,697.16
Promoting commerce, South and Central America, 1918-----	2.89
Promoting commerce, South and Central America, 1920-----	.05
Promoting commerce, South and Central America, 1923-----	10,309.20
Promoting commerce in the Far East, 1922-----	2.45
Promoting Commerce in the Far East, 1923-----	10,898.69
Salaries, office of Supervising Inspector General, Steamboat In- spection Service, 1923-----	231.79
Salaries, Steamboat Inspection Service, 1923-----	11,463.65
Clerk hire, Steamboat Inspection Service, 1923-----	1,843.59
Contingent expenses, Steamboat Inspection Service, 1921-----	.50
Contingent expenses, Steamboat Inspection Service, 1923-----	20,579.78
Salaries, Bureau of Navigation, 1923-----	497.11
Salaries, shipping service, 1923-----	2,906.72
Clerk hire, shipping service, 1923-----	2,711.77
Contingent expenses, shipping service, 1923-----	2.65
Admeasurement of vessels, 1923-----	61.48
Preventing overcrowding of passenger vessels, 1923-----	261.64
Enforcement of navigation laws, 1922-----	6.13
Enforcement of navigation laws, 1923-----	214.69
Enforcement of wireless communication laws, 1922-----	16.63
Enforcement of wireless communication laws, 1923-----	1,202.24
Salaries, Patent Office, 1923-----	38,077.17
Furniture and filing cases, Patent Office, 1923-----	105.51
International protection of industrial property, Patent Office, 1923-----	1,700.00
Photolithographing, Patent Office, 1923-----	9,273.78
Public use of inventions and defending suits, 1923-----	182.64
Rent and storage of Patent Office models, 1923-----	700.00
Scientific library, Patent Office, 1923-----	653.81
Salaries, Bureau of Standards, 1923-----	15,141.08
Equipment, Bureau of Standards, 1923-----	6,433.60
General expenses, Bureau of Standards, 1923-----	4,557.90
Improvement and care of grounds, Bureau of Standards, 1923--	1,650.59
Color standardization, Bureau of Standards, 1923-----	221.62
Gauge standardization, Bureau of Standards, 1923-----	3,538.72
High temperature investigations, Bureau of Standards, 1923--	531.65
Industrial research, Bureau of Standards, 1921-----	1.50
Industrial research, Bureau of Standards, 1922-----	16.00
Industrial research, Bureau of Standards, 1923-----	1,017.10
Investigation of clay products, Bureau of Standards, 1923--	1,117.73
Investigation of fire-resisting properties, Bureau of Standards, 1923-----	647.00
Investigation of mine scales and cars, Bureau of Standards, 1923-----	5,199.71
Investigation of optical glass, Bureau of Standards, 1923-----	2,236.55
Investigation of public-utility standards, Bureau of Standards, 1923-----	643.76
Investigation of radioactive substances, Bureau of Standards, 1923-----	550.75
Investigation of textiles, etc., Bureau of Standards, 1923--	2,838.44
Metallurgical research, Bureau of Standards, 1923-----	214.98
Radio research, Bureau of Standards, 1923-----	310.63
Sound investigation, Bureau of Standards, 1923-----	118.98
Standardization of equipment, Bureau of Standards, 1923--	7,853.71
Standardizing mechanical appliances, Bureau of Standards, 1923-----	899.50
Standard materials, Bureau of Standards, 1923-----	623.82
Sugar standardization, Bureau of Standards, 1923-----	1,018.69
Testing machines, Bureau of Standards, 1923-----	2,783.10
Testing miscellaneous materials, Bureau of Standards, 1923--	1,991.23

Testing railroad scales, etc., Bureau of Standards, 1923-----	\$2, 381. 94
Testing railroad scales, etc., Bureau of Standards, 1922-----	10. 35
Testing structural materials, Bureau of Standards, 1919-----	. 70
Testing structural materials, Bureau of Standards, 1920-----	. 75
Testing structural materials, Bureau of Standards, 1923-----	11, 120. 40
Pay and allowances, commissioned officers, Coast and Geodetic Survey, 1921-----	36. 00
Pay and allowances, commissioned officers, Coast and Geodetic Survey, 1922-----	154. 05
Pay and allowances, commissioned officers, Coast and Geodetic Survey, 1923-----	110, 351. 73
Salaries, Coast and Geodetic Survey, 1923-----	12, 980. 28
Party expenses, Coast and Geodetic Survey, 1921-----	. 50
Party expenses, Coast and Geodetic Survey, 1923-----	69, 312. 06
General expenses, Coast and Geodetic Survey, 1923-----	2, 637. 32
Pay, etc., of officers and men, vessels, Coast Survey, 1923-----	92, 674. 34
Repairs of vessels, Coast Survey, 1923-----	4, 704. 20
Alterations to mine sweepers, Coast and Geodetic Survey, 1922-23-----	1, 911. 74
Alterations to mine sweepers, Coast and Geodetic Survey, 1923-----	2, 512. 91
Salaries, Bureau of Lighthouses, 1923-----	789. 91
Retired pay, Lighthouse Service, 1923-----	2, 705. 19
General expenses, Lighthouse Service, 1920-----	3. 20
General expenses, Lighthouse Service, 1921-----	7. 27
General expenses, Lighthouse Service, 1922-----	928. 16
General expenses, Lighthouse Service, 1923-----	73, 035. 35
Salaries, keepers of lighthouses, 1923-----	33, 672. 91
Salaries, lighthouse vessels, 1923-----	122, 961. 29
Salaries, Lighthouse Service, 1923-----	4, 199. 49
Riprap protection for light stations, third lighthouse district-----	328. 46
Repairing and rebuilding aids to navigation, seventh lighthouse district, 1922 and 1923-----	2, 662. 57
Aids to navigation, Raritan Bay and connected waters, N. Y. and N. J-----	405. 30
Sabine Pass Jetty Light Station, Tex-----	780. 09
Aids to navigation, Conneaut Harbor, Ohio-----	433. 33
Spectacle Reef Light Station, Mich-----	5. 13
Aids to navigation, Coquille River, Oreg-----	46. 63
Aids to navigation, Alaska-----	321. 16
Aids to navigation, Pearl Harbor, Hawaii-----	13. 06
Point Borinquen Light Station, P. R-----	563. 46
Salaries, Bureau of Fisheries, 1921-----	2. 63
Salaries, Bureau of Fisheries, 1922-----	21. 00
Salaries, Bureau of Fisheries, 1923-----	31, 759. 73
Miscellaneous expenses, Bureau of Fisheries, 1923-----	2, 894. 36
Pay, officers and crew of vessels, Alaska fisheries service, 1923-----	1, 765. 68
Protecting seal and salmon fisheries of Alaska, 1923-----	2, 531. 01
Fish hatchery, Duluth, Minn., 1923-----	1. 14
Fish hatchery, Gloucester, Mass., 1923-----	8. 64
Fish hatchery, Yes Bay, Alaska, 1923-----	662. 89
Total-----	1, 005, 909. 02

TABLE 7.—Summary of unexpended balances, 1917-1925

June 30, 1917-----	\$177, 995. 27	June 30, 1923-----	\$730, 397. 27
June 30, 1918-----	149, 009. 51	June 30, 1924-----	1, 072, 835. 58
June 30, 1919-----	476, 045. 10	June 30, 1925-----	1, 005, 909. 02
June 30, 1920-----	1, 149, 363. 28		
June 30, 1921-----	4, 042, 434. 38	Total-----	9, 350, 430. 12
June 30, 1922-----	546, 440. 71		

TABLE 8.—*Personnel, 1925*

Bureau	Permanent		Temporary		Total permanent and temporary		Grand total
	In District of Columbia	In field	In District of Columbia	In field	Male	Female	
Office of the Secretary.....	125				79	46	125
Bureau of the Census.....	712	712	1,156	107	1,283	1,404	2,687
Bureau of Foreign and Domestic Commerce.....	596	535	13	1	643	502	1,145
Bureau of Standards.....	715	34	12	7	677	91	768
Bureau of Fisheries.....	74	336		207	583	34	617
Bureau of Lighthouses.....	44	5,503		211	5,451	307	5,758
Coast and Geodetic Survey.....	197	734	4	57	959	33	992
Bureau of Navigation.....	50	176	2	12	188	52	240
Steamboat Inspection Service.....	15	343			306	52	358
Patent Office.....	1,224		4		910	318	1,228
Bureau of Mines ¹	215	706	9	41	815	156	971
Total.....	3,967	9,079	1,200	643	11,894	2,995	14,889

¹ Under the provisions of the act approved Mar. 3, 1925, the helium production plants of the Navy Department were transferred to the jurisdiction of the Bureau of Mines, and at the same time under the terms of the Executive order of June 4, 1925, a part of the functions of the Geological Survey, with the personnel connected therewith and the larger part of the personnel of the Bureau of Mines, were transferred from the Department of the Interior to the Department of Commerce July 1, 1925. This addition included 53 employees from the helium production plants, 859 from the Bureau of Mines proper, and 59 employees from the Geological Survey, aggregating a total of 971.

TABLE 9.—*Changes in personnel, 1925*

Bureau	Appointments ¹									
	Permanent						Temporary		Total	
	Competitive		Excepted		Unclassified					
	District of Columbia	Field	District of Columbia	Field	District of Columbia	Field	District of Columbia	Field	District of Columbia	Field
Office of the Secretary.....	36		6	0			4		46	0
Bureau of the Census.....	201				131	59	1,362	1,118	1,694	1,177
Bureau of Foreign and Domestic Commerce.....	131	40	31	53	2		40	12	204	105
Bureau of Standards.....	88	3	6	2	3		38	3	135	8
Bureau of Fisheries.....	12	55		12		2	5	34	17	103
Bureau of Lighthouses.....	3	274		5				104	3	383
Coast and Geodetic Survey.....	28	39	1	15	1	10	33		63	64
Bureau of Navigation.....	32	35		23		5	9	34	41	97
Steamboat Inspection Service.....	4	20						4	4	24
Patent Office.....	1,273						2		1,275	
Total.....	1,808	466	44	110	137	76	1,493	1,309	3,482	1,961
Grand total.....	2,274		154		213		2,802		5,443	

¹ Includes appointments of the following character: Presidential; by selection from civil-service certificate; under Executive order; to excepted positions; by reason of transfer within the department, or from other departments or independent establishments; and by reinstatement.

TABLE 9.—Changes in personnel, 1925—Continued

Bureau	Separations ¹									
	From permanent positions						From temporary positions		Total	
	Competitive		Excepted		Unclassified		District of Columbia	Field		
	District of Columbia	Field	District of Columbia	Field	District of Columbia	Field			District of Columbia	Field
Office of the Secretary.....	41		2				5		48	
Bureau of the Census.....	91		1		262	109	328	641	682	750
Bureau of Foreign and Domestic Commerce.....	95	37	24	31	1		34	17	154	85
Bureau of Standards.....	147	2					34	7	187	9
Bureau of Fisheries.....	7	65		5		2	2	22	9	94
Bureau of Lighthouses.....	1	265		5		1		97	1	368
Coast and Geodetic Survey.....	16	9	3	9		14	29	7	48	39
Bureau of Navigation.....	8	37		6		5	5	31	13	79
Steamboat Inspection Service.....	8	25						1	8	26
Patent Office.....	45						5		50	
Total.....	459	440	30	56	269	131	442	823	1,200	1,450
Grand total.....	899		86		400		1,265		2,650	

Bureau	Other changes						All changes		
	Promotions		Reductions		Miscellaneous changes ¹		District of Columbia	Field	Grand Total
	District of Columbia	Field	District of Columbia	Field	District of Columbia	Field			
Office of the Secretary.....	92	0			50		236	0	236
Bureau of the Census.....	273	11	6	2	378	14	3,033	1,954	4,987
Bureau of Foreign and Domestic Commerce.....	189	240	5	13	172	37	724	480	1,204
Bureau of Standards.....	185	3	3		189	37	699	57	756
Bureau of Fisheries.....	55	124	16	1	4	23	101	345	446
Bureau of Lighthouses.....	47	553	6	81		64	57	1,449	1,506
Coast and Geodetic Survey.....	12	26		1	13	13	136	143	279
Bureau of Navigation.....	55	93	1	1	18	27	128	297	425
Steamboat Inspection Service.....	18	42				14	30	106	136
Bureau of Patents.....	250		1		12		1,588		1,588
Total.....	1,176	1,092	38	99	836	229	6,732	4,831	11,563

¹ Includes separations by reason of resignation, discontinuance, retirement, removal, death, transfer within the department, and transfer from the department to other departments or independent establishments.

² Includes reappointments by reason of change of station, name, designation; extensions of temporary appointments, and temporary promotions and reductions.

TABLE 10.—Leave of absence, calendar year 1924

Bureau	Number of employees	Annual leave		Sick leave		Total leave		Average for 1923
		Days	Average	Days	Average	Days	Average	
Office of the Secretary.....	104	2,852	27.42	690	6.63	3,542	34.05	33.35
Bureau of the Census.....	728	21,160	29.07	5,467	7.51	26,627	36.58	37.15
Bureau of Foreign and Domestic Commerce.....	445	12,323	27.69	3,050	6.86	15,373	34.55	33.54
Bureau of Standards.....	642	17,880	27.85	2,886	4.50	20,766	32.35	33.09
Bureau of Fisheries.....	54	1,456	26.96	316	5.85	1,772	32.81	33.82
Bureau of Lighthouses.....	35	1,043	29.80	259	7.40	1,302	37.20	37.24
Coast and Geodetic Survey.....	176	5,063	28.77	733	4.16	5,796	32.93	34.61
Bureau of Navigation.....	37	1,024	27.68	165	4.45	1,189	32.13	32.86
Steamboat Inspection Service.....	13	375	28.85	85	6.53	460	35.38	32.36
Total and average.....	2,234	63,176	28.28	13,651	6.11	76,827	34.39	34.69

TABLE 11.—Printing and binding

Bureau, office, or service	Expenditures, 1925 ¹	Allotments, 1926
Services other than the Patent Office and the Bureau of Mines:		
Office of the Secretary (Secretary, Assistant Secretary, solicitor, chief clerk, and division of publications).....	\$14,006.72	\$16,500.00
Appointment division.....	929.93	900.00
Disbursing office.....	399.61	600.00
Division of supplies.....	1,392.78	1,500.00
Bureau of the Census.....	137,026.62	112,000.00
Coast and Geodetic Survey.....	44,254.16	40,000.00
Bureau of Fisheries.....	18,462.15	17,000.00
Bureau of Foreign and Domestic Commerce.....	214,142.75	181,000.00
Bureau of Lighthouses.....	17,698.80	17,500.00
Lighthouse Service.....	6,117.41	7,000.00
Bureau of Navigation.....	29,150.79	27,000.00
Shipping and Radio Services.....	7,429.40	8,500.00
Bureau of Standards.....	54,002.81	40,000.00
Office of the Supervising Inspector General, Steamboat Inspection Service.....	1,144.99	1,500.00
Steamboat Inspection Service.....	12,473.71	14,500.00
Customs Service.....	8,958.64	8,500.00
Reserve.....	7,408.73	6,000.00
Total.....	575,000.00	500,000.00
Patent Office:		
Specifications, Official Gazette, etc.....	905,000.00	\$10,000.00
Miscellaneous.....	70,000.00	69,200.00
Reserve.....		800.00
Total.....	975,000.00	880,000.00
Bureau of Mines:		
Publications.....	40,000.00	\$ 53,370.00
Miscellaneous.....	10,000.00	\$ 10,900.00
Reserve.....		600.00
Publication of reports of investigations of lignite coals and peat (Public 580, 68th Cong.).....		6,000.00
Total.....	50,000.00	70,870.00
Total for department.....	1,600,000.00	1,450,870.00

¹ Estimated (June 30, 1925); exact figures for 1925 can not be given until all work ordered in that year is completed and billed. Expenditures will approximate the amounts available.

² Includes \$16,370 transferred from the appropriation for printing and binding for the Geological Survey.

³ Includes \$1,000 transferred from the appropriation for printing and binding for the Geological Survey.

TABLE 12.—Sales of publications

Sales	Copies			Receipts		
	1922	1923	1924	1922	1923	1924
By Superintendent of Documents:						
Miscellaneous sales.....	227,428	283,941	530,463	\$40,348.13	\$40,258.83	\$55,691.87
Subscriptions.....	739,808	858,054	970,254	34,788.17	38,293.50	34,147.73
Total.....	967,236	1,141,995	1,500,717	75,136.30	78,552.33	89,839.60
By Coast and Geodetic Survey:						
Coast pilots, inside route pilots, tide tables, current tables, and charts.....				40,075.30	48,973.01	48,800.67
Grand total.....				115,211.60	127,525.34	138,640.27

NOTE.—The 1924 receipts from sales of publications issued by the Patent Office and the Bureau of Mines, which bureaus were recently transferred to the Department of Commerce, amounted to \$283,754.87 for the Patent Office and \$11,838.15 for the Bureau of Mines.

TABLE 13.—Departmental shipments, 1925

NUMBER OF SHIPMENTS

Bureau	Less carloads	Carloads	Total	Total ton- nage in pounds
Coast and Geodetic Survey.....	833	16	849	1,350,738
Chief clerk.....	1,137	12	1,149	1,339,321
Bureau of Lighthouses.....	5,006	221	5,227	17,124,884
Bureau of Fisheries.....	1,040	34	1,074	2,620,675
Bureau of Standards.....	1,020	4	1,024	390,126
Bureau of Foreign and Domestic Commerce.....	113	.....	113	95,462
Bureau of the Census.....	40	.....	40	38,013
Bureau of Navigation.....	24	.....	24	6,770
Steamboat Inspection Service.....	4	.....	4	126
Total.....	9,217	287	9,504	22,966,115

DETAILS OF SHIPMENTS

Bureau	Weight in pounds			Number and method of movement				
	Freight	Express	Parcel post	On bill of lading, freight, and express	Not on bill of lading			
					Freight	Express	Parcel post	Total
Coast and Geodetic Survey.....	1,320,552	27,357	2,829	757	9	4	79	92
Chief Clerk.....	1,322,267	16,655	399	1,112	1	8	28	37
Bureau of Lighthouses.....	17,041,377	34,243	49,264	2,437	37	17	2,736	2,790
Bureau of Fisheries.....	2,518,392	102,283	.....	1,021	21	32	.....	53
Bureau of Standards.....	361,442	26,264	2,420	679	15	24	306	345
Bureau of Foreign and Domestic Commerce.....	90,118	5,334	10	104	2	6	1	9
Bureau of the Census.....	34,413	3,600	.....	39	.....	1	.....	1
Bureau of Navigation.....	3,018	3,752	.....	23	1	.....	.....	1
Steamboat Inspection Service.....	.....	116	10	2	.....	1	1	2
Total.....	22,691,579	219,604	54,932	6,174	86	93	3,151	3,330

NOTE.—In addition there were handled, principally by the Bureau of Standards, 23,900 shipments, the charges on which were not paid by the department, total tonnage, 940,000 pounds; sleeping, parlor car, and steamship reservations, 3,353; routing orders for carload obtained from Federal Traffic Board, 196; routing orders for carload issued by traffic manager, 91; routings furnished for less carload by traffic manager, 2,176; freight and express bills audited, 5,625; tracers, freight, 60; claims, freight and express, 14; refunds, passenger, 85; proposals considered, 425; passenger fares quoted, 2,718; itineraries furnished, 447; freight and express rates quoted, 1,325; tickets purchased, 1,371; export shipments made since January 1, 1925, 74.

Very truly yours,

E. W. LIBBEY,
Chief Clerk and Superintendent.

BUREAU OF THE CENSUS

DEPARTMENT OF COMMERCE,
BUREAU OF THE CENSUS,
Washington, July 1, 1925.

HON. HERBERT HOOVER,
Secretary of Commerce.

DEAR MR. SECRETARY: In response to your request I furnish the following condensed report upon the work of this bureau during the past year:

INTRODUCTION AND SUMMARY

During the past fiscal year the Bureau of the Census was exceptionally active.

It gave employment—in a large proportion of cases temporary—to 27,259 persons, including 24,878 temporary field employees for the census of agriculture.

It collected detailed reports concerning agriculture from about 6,400,000 farms, and compiled the principal data and published preliminary figures for 476 counties and for three States, representing a total of about 803,000 farms.

It compiled statistics of manufactures, including forest products, from data collected at the biennial census for 1923, covering 350 industries; issued more than 400 preliminary summaries for industries, States, and cities; and prepared for publication, in bulletin form, 57 reports presenting statistics for 142 of the leading industries of the country.

It collected 2,000,685 certificates of births and 1,191,301 certificates of deaths, containing all the detail available and required by law, and carried on its regular annual compilations of birth and death statistics and its weekly publication of death statistics for large cities.

It issued reports giving detailed statistics relating to the 1,129,045 marriages and 148,815 divorces recorded for the calendar year 1922 and the 1,224,373 marriages and 165,226 divorces recorded for 1923. At the close of the fiscal year, 846,766 marriages and 161,642 divorces had been reported for the calendar year 1924.

It has compiled and published—

Annual detailed statistics of the financial transactions of the governments of all States and of all cities having 30,000 inhabitants or more.

The monthly Survey of Current Business, giving statistics of production, stocks, orders, prices, trade, etc., for practically all "key" industries of the country.

Monthly reports concerning production, consumption, and stocks, from data collected from approximately 27,000 manufacturers representing the leading industries of the country.

Semiannual reports on production, consumption, sales, and stocks of sulphuric acid and acid phosphate in the fertilizer industry.

Semiannual reports relating to paint and varnish production.

Quarterly reports covering the production of glues of animal origin and edible gelatin.

An annual report on the production of lighting equipment (1924).

An annual report on constant-potential transformers (1924).

An annual report on the consumption of vegetable tanning materials (1923).

Annual reports on forest products, namely, turpentine and rosin (1924); pulp-wood consumption and wood-pulp production (1924); and lumber cut of 769 identical mills (1923 and 1924).

Reports showing the quantities of cotton ginned to specified dates by 18,656 ginneries, issued 12 times during the ginning season.

Monthly reports on the consumption of cotton and on stocks held at mills and in public storage throughout the country.

Monthly reports showing the numbers of spinning spindles and active spindle hours for the cotton mills in the United States.

Monthly reports of cottonseed received, crushed, and on hand, and cottonseed products manufactured, shipped out, and on hand.

Two annual bulletins on cotton—one in the spring on cotton production, the other in the fall on the supply and distribution of cotton.

Decennial reports (for 1922-23) on almshouses; institutions for the care of children and dependent adults; hospitals for the mentally diseased, the feeble-minded, and epileptics; prisons; and hospitals and dispensaries.

Annual and quarterly reports showing stocks of leaf tobacco held by manufacturers and dealers.

Annual and quarterly reports on production, consumption, and stocks of animal and vegetable fats and oils.

Quinquennial reports (for 1922) for a complete census of electrical industries, covering central electric light and power stations, electric railways, telephones, and telegraphs.

Five monographs, prepared by special writers, analyzing and interpreting the census statistics so as to bring out fully their sociological and economic significance.

The bureau, in cooperation with the Geological Survey, made a survey of the commercial stocks of anthracite and bituminous coal to ascertain the condition of the coal supply for the months of June, July, and August, 1924.

It carried on negotiations with associations of manufacturers, boards of trade, chambers of commerce, and city and State governments, with the view of securing uniformity in the form of the questionnaires used in collecting statistical data and eliminating duplication of inquiries.

It also carried on negotiations with religious organizations in preparation for the decennial census of religious bodies.

It held conferences with persons interested in the forthcoming census of water transportation, to discuss the items to be included in the schedules used.

It has arranged for the publication, as of July 1, 1925, and annually thereafter, of a register of officials in the Government service.

It supervised special censuses of population in four cities and towns having an aggregate population of 1,216,381, the expense of this work being borne by the local authorities.

It estimated the population of the United States as a whole, and of the States, the counties, and the cities having 8,000 or more inhabitants.

It kept records of the changes in names and boundaries of cities and other political subdivisions of counties, and of the incorporation of new municipalities and the formation of new counties.

It was in communication, either personally or by correspondence, with the officials of 14 State governments concerning the taking

of mid-decennial censuses of population; also with the officials of 11 cities, having an aggregate population of 2,500,000, with regard to population censuses to be supervised by officials of the bureau.

It compiled from census schedules and supplied to 264 organizations and individuals special information concerning industries or localities for which the desired data were not shown in the printed census reports.

It made 69 special tabulations of detailed data for outside organizations and individuals. (This work was done by persons not regularly employed by the Census Bureau, their compensation being paid by the organizations and individuals for whom the tabulations were made.)

The bureau arranged for or assisted in the making of 3,568 searches of old census records in order to establish proof of age for pension retirement or for working papers, to obtain information needed for the settlement of estates or local controversies, to establish citizenship for passports, or to establish genealogical connections.

It tabulated data concerning the number of vacant houses and living apartments in the District of Columbia.

Its mechanical tabulation work comprised the punching of 43,287,342 cards, the sorting of these cards, and the tabulation of the data thereon, the total number of operations being equivalent to the passing of 198,234,273 cards through one machine once.

The bureau participated in 27 special and formal conferences and in numerous informal ones held for the purpose of improving its statistical work or of effecting economies.

During the fiscal year the bureau issued 140 reports, monographs, bulletins, and miscellaneous publications having a total of 13,010 pages, and at the close of the year work was in progress at the printing office on 52 reports and other publications with a total of 3,736 pages.

It issued 1,660 press announcements, with a total edition of 4,005,117, summarizing the principal statistics compiled from its various inquiries, and in addition sent out approximately 3,335,000 pieces of mail matter.

It mailed 430,750 circulars advertising 59 Census Bureau publications for sale by the Superintendent of Documents.

On June 30 there were in use by the Bureau of the Census 2,042 punching, calculating, adding, sorting, tabulating, and numbering machines and 737 typewriters.

CENSUS OF AGRICULTURE

The outstanding work of the bureau during the year was the census of agriculture, taken as of January 1, 1925. The enumeration of the farms was completed, and the office work incident to the publication of the statistics had been begun before the close of the fiscal year.

This is the first mid-decennial census taken under the act of March 3, 1919. It required the appointment and instruction of 204 supervisors, about 23,945 enumerators, and 2,131 clerks for work in the offices of the supervisors and in Washington. This temporary force of 26,280 employees was supplemented by details from the

regular statutory roll. The total number of appointments and details was 26,423.

The object of this census is to show the actual condition of agriculture during a selected year (1924.). The enumeration was made during the late fall of 1924 and the winter, when farm work, as a rule, was not pressing, and the farmers could find the time to act as enumerators if they desired to do so. The pay was fixed at a rate that enabled each enumerator to earn a fair compensation for his work. This was the first time in the history of American census taking that a special effort was made to secure the services of persons identified with agriculture in taking a farm census. The presidents of State agricultural colleges recommended suitable persons to act as supervisors. Forest rangers of the Department of Agriculture enumerated the farms in the vicinity of forest reserves, employees of the Bureau of Reclamation canvassed those on irrigation projects, and Indian agents collected the data for farms on Indian reservations. By securing the cooperation of those various agencies and by other economies a net saving of approximately \$500,000 was made in the cost of the enumeration as compared with that of 1920.

In many districts it was difficult to obtain a sufficient number of competent men to serve as enumerators. Although the census was primarily for the benefit of agricultural interests, a considerable number of farmers declined to answer the inquiries until they were threatened with prosecution under the penal provisions of the law. These difficulties and the accompanying delays retarded the canvass in some States. The most serious delay, however, was due to the inclemency of the winter weather. The prolonged snowstorms in the northern and western States and the heavy rains in the South made it impossible for the enumerators to cover their districts as rapidly as had been anticipated. In some cases the farmers had finished their year's work and left the farm for the winter before the visit of the enumerator, and in such cases considerable time was consumed in finding the farmers, or other persons competent to supply the information, and securing the returns.

For these reasons there were some districts for which the final returns did not reach the bureau until after July 1, 1925, although in a majority of the districts the enumeration was completed before the close of February.

In order that the results of this census might be published as quickly as possible, arrangements were made for the supervisors to send in the returns, county by county, as rapidly as the canvass was finished. The office work of editing and tabulating was organized to proceed with the county as a unit, and the publication of the statistics was begun on March 10, 1925, when summary figures for two counties in California and one in Maine were given to the press. The summaries for other counties followed rapidly, and by June 30 they had been issued for 476 counties, including all counties in three States. It is hoped that the totals for the United States can be published before the close of the present calendar year. The statistics have been made public at much earlier dates than ever before, thus establishing another record in census work.

Specializing on a census of agriculture has enabled the bureau to give more careful attention to local conditions and practices. State commissioners of agriculture and local agents have been consulted

more freely than at any prior census. This has made possible the detection and correction of erroneous reports, and has therefore resulted in an increase in the accuracy of the statistics. The census is, however, by no means perfect. It is the exception to find a farmer who keeps a systematic record of his annual transactions, and the information he gives the enumerator is, therefore, necessarily based on his recollection of acreage planted, yield, amounts of livestock products, etc., and his estimate of the value of his farm and equipment.

In order to obtain information urgently requested by the Department of Agriculture and by associations and individuals interested in farm statistics, the 1925 farm schedule was made fairly comprehensive, although it contained less than one-half as many questions as the schedule used at the decennial census of 1920. A number of special inquiries were carried, including questions on some subjects not covered at any prior census.

These inquiries were carried on the schedule because it would require very little additional time for the enumerators to obtain the answers, but their inclusion has resulted in an increase in the cost of the tabulation and other office work. The tabulations are made by the punch-card system, and it was found that the appropriation was not sufficient to permit the punching of cards for the answers to all the inquiries. The inquiries to be covered by the first tabulation were carefully selected. There remain a number of important subjects, such as farm expenses, debts, cooperative marketing, farm facilities, farm population, sheep, wool, animals slaughtered on farms, and poultry products, for which it will be impossible to tabulate the data unless an additional appropriation is made.

The Department of Agriculture understands this condition, and generously offered to postpone or abandon certain of its own work provided the funds available for such work could be transferred and used for the completion of the census tabulation, but the Comptroller General has ruled that such a transfer of funds can not be made.

CENSUS OF MANUFACTURES

The number of schedules collected at the recent biennial census of manufactures, which covered industrial operations during the calendar year 1923, was approximately 196,000. It was, however, necessary to make a half million requests for the return of these schedules. By the most extensive use of the mails only about 100,000 schedules were obtained, leaving nearly as large a number to be collected by agents in the field. Of the schedules received by mail, approximately 50 per cent were correct or could be corrected in the office, the remainder being so incomplete as to necessitate their return to the manufacturers for fuller information. In connection with the completion and correction of the returns received by mail, it was necessary to send approximately 100,000 letters of inquiry to individual manufacturers. This lack of care in the preparation of the census schedules results in increased cost and delays the preparation of the data for tabulations.

An important phase of the manufactures work, and one which demands much forethought and time, is the preparation of the

various schedules of inquiry. In order that the data gathered may be of the greatest possible value to individual manufacturers and industrial organizations, the schedules to be used at each census must be carefully revised in the light of important industrial changes and developments. This involves a great deal of correspondence. One of the important changes in the schedules for 1923 consisted in the inclusion, in compliance with urgent requests, of inquiries in regard to power employed and fuel consumed, no such inquiries having been carried on the schedules for 1921.

The insistent demand is made for more and more detail as to kinds and quantities of manufactured products, but the diversification of American industry renders it difficult to supply the information desired. For example, the bureau is asked to compile statistics regarding the manufacture of kitchen utensils. Such articles are made in a number of industries, and particularly in the "aluminum manufacture" and "stamped and enameled ware" industries. Moreover, kitchen utensils are made to some extent as minor products by establishments engaged primarily in other lines of manufacture. Thus it is necessary to make extensive research into the census reports in order to comply with requests of this nature.

At the biennial census for 1923, in compliance with insistent demands, the bureau employed a special schedule calling for data as to the kinds and quantities of materials used in the bakery industry. Prior to the publication of the statistics compiled from these data it had been assumed that 65 per cent of the total of wheat flour consumed in the United States was used by bakeries and 35 per cent by homes, hotels, restaurants, etc. The census statistics, however, revealed the reverse of this condition, the bakeries having reported approximately 35 per cent of the total consumption, leaving 65 per cent as the proportion consumed in homes, hotels, restaurants, etc.

The preliminary work of the census for 1925, consisting principally of the preparation of lists of manufacturers, was begun before the close of the fiscal year. In taking this census the bureau will employ the methods of cooperation inaugurated at the census for 1923. Business and industry generally are interested in the manufactures statistics. Their attitude is entirely different from what it was two decades ago. At that time manufacturers were apparently indifferent to the value of statistics showing the activity in their respective industries, but now there is a general realization of the need of such information, and a continually increasing proportion of the manufacturers are making their reports by mail, thus rendering it unnecessary to send special agents to collect the data.

VITAL STATISTICS

Births and deaths.—One of the most important of the many statistical inquiries conducted by the Government is the Census Bureau's collection of data in regard to births and deaths. For deaths, these data have been collected annually since 1900, when the "registration area" was composed of 10 States, the District of Columbia, and nearly 200 registration cities in nonregistration States. Birth statistics have been collected and compiled by the bureau annually since 1915, when 10 States and the District of Columbia composed the birth-registration area. The two registration areas have been

extended from time to time until the former now embraces 41 States, the District of Columbia, the Territory of Hawaii, and 14 cities in nonregistration States, and the latter comprises 34 States and the District of Columbia. The proportion which the population of the death-registration area forms of the total population of the United States has increased from 41 per cent in 1900 to 92 per cent in 1925, and the corresponding proportion for the birth-registration area has increased from 31 per cent in 1915 to 76 per cent in 1925.

The approach of these percentages toward the 100 mark gives an increasing significance to the birth rates and death rates computed from year to year. The excess of births over deaths in the birth-registration area is more than 1 per cent per annum, which warrants the conclusion that the natural increase of the population of the United States is now well above a million a year. (This does not, of course, include the increase due directly to immigration.)

Special attention is called to the fact that the rapid extension of the birth-registration area makes it possible to present, for a continually increasing portion of the country, accurate birth rates, accurate infant mortality rates, and accurate death rates from puerperal causes.

The annual mortality statistics give the number of deaths from each cause in each locality, and thus make it possible to measure the toll exacted by each cause of death from year to year. Such figures serve as the foundation of public-health work. They indicate to the public-health officer the most promising direction for the expenditure of funds appropriated for such work, and they clearly show what degrees of success have attended the campaigns for better health in former years. The declines in the infant-mortality rate and in the death rates from typhoid fever, diphtheria, tuberculosis, and many other diseases afford striking proof of the success of former campaigns, but one views with concern the continually mounting rates from cancer and heart diseases.

Mortality statistics measure not only the ravages of disease but also the fatalities from accidents. Here, too, the declining death rates for most forms of accidents are encouraging, the principal exception being the increase in the rate for motor-vehicle fatalities.

Believing that the frequent presentation of statistical information regarding motor-vehicle fatalities will be a factor in bringing about a greater degree of safety on the public highways, the Bureau of the Census is now publishing every four weeks telegraphic returns of such fatalities from cities of 100,000 population or more, and is endeavoring to collect data which will permit the publication annually of two sets of death rates from motor-vehicle accidents—one referring to the number of deaths reported from each locality, regardless of where the accidents occurred, and the other representing the number of deaths due to accidents in each locality, regardless of where the deaths occurred. The collection of these important data is being made possible by the hearty cooperation of State, city, and local officials everywhere.

Marriage and divorce.—Statistics of marriages, births, and deaths constitute what are generally known as "vital statistics." Definite provision has been made by law for the collection of data on births

and deaths. This work has now been in progress for more than 20 years. It covers the majority of the States and is approaching a degree of accuracy that compares favorably with that shown by statistical work in the same field in other countries. Data on marriage and divorce have not been collected with the same regularity. There have been varying periods of intermission in the work, and the results do not supply a satisfactory continuous picture.

Marriage and divorce are social facts of fundamental importance, and statistics regarding them are of great value considered merely as a contribution to our knowledge of social conditions and tendencies in the United States. We need to know what the marriage rate is in the United States, how it compares with the rates of other countries, whether it is increasing or decreasing, whether there is a tendency to defer marriage, and how it is affected by economic conditions. It has been said that the marriage rate is the barometer of prosperity, and statistics show that marriages increase as a result of "peace after war, abundance after dearth, high wages after want of employment, and speculation after languid enterprise."

I believe it to be of equal or even greater importance that we make annual compilations of statistics in regard to the prevalence of divorce. The high and rapidly rising divorce rate in this country is generally regarded as a great evil. We ought to know the extent to which this evil prevails in the several States and to ascertain, so far as possible, the facts regarding the causes of it.

It is very important that all marriages should be adequately and properly registered. It is not proposed, however, that the Census Bureau should take charge of marriage registration. That is a matter which will be left in the hands of the State and local authorities. Nevertheless, regular requests coming from the Federal Government for data regarding marriages will, beyond question, tend to promote and improve registration by local authorities, just as the collection of birth and death data has promoted and improved the registration of births and deaths. This will be an incidental but important benefit resulting from the regular collection of the data.

The data on this subject should be collected by the States and compiled by the Census Bureau for the entire country. Such an arrangement would lead to more satisfactory results and would reduce the cost of the work. This is being recognized by an increasing number of State officials. The data for 1924 for both marriage and divorce were compiled from the records of 11 States and the District of Columbia, and for marriage only from the records of 16 additional States.

INSTITUTIONAL POPULATION

The statistics relating to institutional population show the numbers of inmates, patients, or persons treated, and other information in regard to institutions for the mentally diseased, feeble-minded, epileptics, and juvenile delinquents; almshouses, prisons, reformatories, jails, and workhouses; institutions and societies for the care and protection of children; day nurseries, humane societies, children's protective agencies, homes for crippled children, and institutions for the care of adults; and hospitals, sanatoriums, and dispen-

saries. The inquiry covered the year 1922 for certain institutions and the early part of 1923 for others.

The summary statistics for all these institutions were published in the spring and fall of 1924. The work during the past fiscal year consisted in the preparation of the tables and text for the final reports. The manuscript for all these reports was finished before July 1, and some of them have already been printed and distributed.

FINANCIAL STATISTICS OF STATE AND CITY GOVERNMENTS

Unfortunately, the financial reports of the State and city governments are not prepared in a uniform manner. It is impossible to obtain from the annual reports of these governments data that will make possible exact comparisons of the expenditures for the same objects in different communities, and in some instances the total amounts derived from taxation are not shown. It is essential, therefore, that the data be assembled by some central office.

The annual reports of the Bureau of the Census present statistics as nearly accurate and as comparable as it has been feasible to compile from the records of the States and the cities. The principal subjects covered are: (1) Total and per capita receipts from revenues and from the principal classes thereof; (2) total and per capita payments for operation and maintenance, interest on debt, and outlays; (3) total and per capita indebtedness; (4) assessed valuation of property, tax levies, rates, and methods of assessment; and (5) discussion of State and municipal accounting terminology, instructions for uniform classification of accounts, and kindred subjects.

These reports provide information in regard to the financial administration of the governments of the States and of the cities having 30,000 population or more, reflect their financial condition, serve as a guide to the officials in planning future operations and in extending or curtailing functions or activities; supply assistance to officials who are charged with responsibilities incident to the administration of the governments, and enable the public to judge intelligently of the fidelity, efficiency, and economy practiced by their officials. Institutions of learning are introducing these reports as branches of their curricula.

Method of collection.—It is necessary to send the agents of the bureau to most of the State capitals and to the cities to collect these data on an accurate and comparable basis. In the cases of some States and cities the annual reports of the financial officers contain a large proportion of the required data, and from these reports schedules are compiled in the bureau, so far as possible, thereby eliminating the additional cost of maintaining agents in the field. Unfortunately, however, many of these printed reports are not available until several months after the close of the fiscal year, and if the bureau awaited their publication its statistics would be of value only from a historical standpoint. Another serious drawback to depending entirely on the printed reports of the States and cities is that such reports do not present the data in comparable form.

The National Association of Comptrollers and Accounting Officers at its convention in 1923 adopted a resolution to the effect that comparable statistics could be compiled accurately and impartially only by trained agents of the bureau.

Through the cooperation of State and city officials, and the use, so far as practicable, of the printed reports of the States and cities, the cost of the field work is being reduced each year.

Publication of the statistics.—The field work for 1924 was begun in February, 1925. The schedules are checked and tabulated promptly after their receipt, and summaries of the principal statistics are published. After individual summaries have been released for the 48 States and the 248 cities having more than 30,000 inhabitants, a summary for all States and one for all cities will be prepared and published. These final summaries, which will be made available to the public in a comparatively short time after the completion of the tabulation for the last State and the last city, will in many cases meet fully the requirements of persons who have occasion to use the bureau's financial statistics of States and cities. The complete reports present, of course, more thorough comparisons of the figures for the States and cities. The summary figures show the general trend in regard to the increasing cost of government, but the detailed figures in the complete reports bring out clearly the amounts of the increases in taxation, in the several classes of expenditures, and in indebtedness.

WEALTH, PUBLIC DEBT, AND TAXATION

This decennial investigation, which covered the year 1922, was completed prior to July 1, 1924, and the final reports were printed before the close of the calendar year 1924. The more important of the statistics, however, had been made available to the public through press summaries and bulletins issued during 1923. The final reports, five in number, are as follows: Public Debt, Assessed Valuation and Tax Levies, Taxes Collected, Digest of State Laws Relating to Taxation and Revenue, and Estimated National Wealth.

SURVEY OF CURRENT BUSINESS

The Survey of Current Business is a monthly publication whose purpose is to supply to business men the current basic statistics in important lines of industrial and commercial activity. These statistics as a rule show monthly transactions, but in a few cases they are based on data collected quarterly or semiannually. This publication has supplied a genuine need. Comments of subscribers show that the statistics on more than a thousand different business movements which are presented in the Survey are being used by business men to ascertain the exact status of affairs in their own and other industries, as well as in business in general, and that through their possession of these facts they are enabled to plan intelligently their policies with respect to sales, production, purchases, stock, and financing. Business as a whole is, more and more, looking to current industrial facts for guidance, and the large increase in the number of statistical inquiries undertaken during the past few years, both by the Government, on the initiative of industrial and trade associations, and by the associations themselves, in order to provide such data for executive judgment, is in itself evidence of their usefulness.

Considerable changes in the size and make-up of the Survey were made within the fiscal year. It was necessary to make a material

reduction in its size because of the smallness of the appropriation allowed for printing. The smaller monthly editions, which had previously contained about 60 pages, were cut down to 48 pages, and the larger editions were reduced from about 240 pages to about 160 pages and their period of issue changed from quarterly to semi-annually. These reductions in size entailed a complete rearrangement of material, which consisted of the elimination of most of the relative numbers, the dropping of statistics on foreign conditions, the reference of the reader to previous issues for certain basic material instead of repeating it in the tabulations, the omission of tabular matter in the text, the condensation and combination of minor items, and the elimination of duplicate printings of the same items.

By these expedients it has been possible to make a reduction of nearly 40 per cent in the annual cost of printing the Survey. In the face of this necessity for retrenchment in printing it has been highly desirable from time to time to include new statistical material for the sake of presenting business conditions completely along certain lines. The space for such new material has been provided by the above-mentioned reductions, and at the present time the Survey is published in a much more compact form than in previous years.

During the last fiscal year certain trade associations, including the Knit Goods Association of America and the Refractories Manufacturers' Association, gave up their statistical activities in favor of inquiries which would cover larger proportions of the industries, to be conducted by the Census Bureau.

Summaries of the figures collected for the Survey are also sent out each week to the newspapers in the form of press releases, which are widely published by the daily papers as well as by trade journals.

STATISTICS OF TOBACCO, COTTON, AND LEATHER

The acts of Congress approved April 30, 1912, August 7, 1916, June 5, 1920, April 2, 1924, and May 3, 1924, provided for the collection of data in regard to tobacco, cotton, and leather. In compliance with these laws, and in the endeavor to furnish statistics that will be of greater value to the producers and consumers of the commodities mentioned, there have been built up in the bureau very comprehensive lists of establishments in the several industries.

Tobacco.—The tobacco statistics show the quantity of each type of leaf tobacco held by registered dealers and by certain classes of manufacturers coming within the scope of the law, together with the quantities held in bonded manufacturing warehouses and in United States bonded warehouses. The statistics relate to the 1st of January, April, July, and October. These preliminary reports are assembled in the annual bulletin, which also presents pertinent statistics relative to the tobacco industry that have been published by other bureaus and organizations.

Cotton.—The collection of data for the cotton industry has been in progress for 23 years, reports on cotton ginned having been authorized by the act of March 6, 1902, establishing the permanent Census Office. This industry affects directly and indirectly so large a proportion of the population of the United States that it is probable the cotton reports are scrutinized more carefully than are those for any

other of the "key" products. Every precaution is therefore being taken by the bureau to verify the figures. Each ginner is required to report the quantity of cotton ginned by him prior to each of the dates specified in the law. In addition, at the end of the ginning season each ginner is called upon to make an independent report, direct to the Washington office, of the total quantity of cotton ginned during the entire season. The reports collected by the agents and those obtained direct from the ginners are then compared and checked in order to verify the production statistics.

Each cotton-consuming establishment reports monthly the number of bales consumed during the month and the number held in stock at the close of the month. At the close of the cotton year these reports are summarized and sent to the establishment for verification. A similar practice is followed in verifying the reports on cotton in public storage and those from cottonseed-oil mills and cotton-oil refineries and consuming establishments. This method permits the making of any necessary corrections in the reports for the several months, and such revisions are carried in the final figures which appear in the annual bulletin.

Leather.—The several associations connected with the leather industries have from time to time petitioned the bureau for further detail concerning classes of hides tanned, kinds of leather produced, and quantities of the various leather products. To collect the information required, the bureau uses 12 separate schedules, containing a total of 533 items. Each of the approximately 4,500 establishments engaged in the leather industries is required to make monthly reports during the year, and some establishments return more than one schedule each month. The total number of reports received during the year is approximately 55,000. The assembling, checking, and publication of so great an amount of technical detail is a work of very considerable magnitude, which requires the services of a number of employees having expert knowledge of the leather industries.

COLLECTION OF INDUSTRIAL AND BUSINESS DATA

At the close of the fiscal year 103 trade and industrial associations were supplying the bureau with regular statistical reports for publication in the Survey of Current Business. The data in these reports were collected by the associations directly from the separate establishments and were sent to the bureau for publication. In every case the publication is general, the information being made available to all persons irrespective of their interests or industrial affiliations. In cases where the association does not represent or is not able to secure reports from a representative number of establishments, the bureau supplements the work of the association by collecting data from those establishments that fail to report through it. This is an entirely new departure in the census work, and I believe it is the right method of procedure. Industrial and business statistics are accurate and reflect existing conditions truly only when those who supply the data are in sympathy with the work and cooperate willingly and freely in carrying it on. A feeling of confidence in the work of the bureau and a willingness to supply the data are essential.

For this reason I have been careful, before undertaking a new inquiry, to make a preliminary survey in order to ascertain whether

the manufacturers, dealers, and others concerned want the bureau to assemble and publish the statistics, and whether they will supply the data promptly.

The constant employment of a large force of field agents to collect the original data required in the extensive and rapidly expanding work of the bureau would require a much larger annual appropriation than is now granted, and I am by no means satisfied that such a method of procedure would be wise. The most economical and practical method of collecting the material is by mail. The success of this method, however, depends upon the promptness of the replies. It is frequently necessary to send several requests for replies to a questionnaire, but it is hoped that in time this indifference will be corrected and the full and complete cooperation of the industries will be secured, so that the bureau will be able to carry on its field work still more economically and satisfactorily.

By the methods described the bureau collects data annually or at more frequent intervals for 45 distinct inquiries, covering in detail 76 different products manufactured by 50,292 establishments.

While this work is being extended and put on a more satisfactory basis, perplexing problems are continually arising. The conditions attending the collection of the statistics for wool illustrate a number of these. Estimates of the annual production of wool are prepared by the Department of Agriculture, and the actual production is reported every fifth year in connection with the census of agriculture. The monthly consumption and the stocks in the textile mills are reported to the Department of Commerce, and statistics of the stocks held by dealers are compiled by the Department of Agriculture. Thus in order to obtain full information in regard to wool production, consumption, and stocks, it is necessary to bring together and harmonize the data obtained from these various sources.

The producers contend that, whereas the statistics of production are substantially complete, there are a number of important manufacturers and dealers who refuse to supply the data on consumption and stocks. It is true that the attitude of some, if not all, of these manufacturers and dealers is that they appreciate the value of statistics of this character, but will not supply the data on which they are based unless there is a direct provision of Federal law requiring all manufacturers and dealers to do so. The wool growers' associations are now advocating the passage of such a law. Special laws of this character already provide for the compilation of detailed statistics covering cotton, leather, and other products. The performance of this work in two or more departments is confusing and costly. It would enhance the value of the statistics, reduce expense, and minimize the difficulties of administration if all the work were done in one department.

COOPERATION IN STATISTICAL WORK

For some years the Bureau of the Census has been endeavoring to cultivate cooperation among the Federal and other agencies in charge of statistical work. The industrial and trade organizations that for many years have been collecting data for their respective industries have, with rare exceptions, made cooperative arrange-

ments with the bureau which have gone far toward eliminating unnecessary calls upon business for statistical information; and during the past fiscal year the bureau has entered into cooperative arrangements with State and city governments and other local governmental organizations to a greater extent than ever before. These arrangements have been of mutual advantage, and the spirit of cooperation thus engendered has been increased by the willingness of the Census Bureau to assist both private and public organizations by making special tabulations. The bureau's method of publishing preliminary summary statistics in press-release form as rapidly as they can be tabulated has also gone far toward satisfying the demand for prompt information which formerly was met largely by private organizations.

ESTIMATES OF POPULATION

The need of an enumeration of the population at more frequent intervals than once in 10 years was referred to in my annual report for the fiscal year 1924. I also described the method of estimating, for the intercensal years, the population of the United States, the States, the principal cities, and some of the smaller political subdivisions. The committee of statisticians which has this matter under consideration recommends that the estimate of the population for the United States as a whole be based upon the statistics of births, deaths, immigration, and emigration, and the estimates for 1926 and subsequent years will be prepared by this method. There are no data, however, concerning interstate or intercity migration, or migration from rural to urban districts, so that it is impossible to estimate the population of the States, cities, and counties by the new method. Under these conditions it is very important that a census of the population of the entire United States be taken every fifth year. In the absence of such an arrangement the bureau has been cooperating, so far as possible, with the governments of the eight States—Florida, Iowa, Kansas, Massachusetts, New York, Rhode Island, South Dakota, and Wyoming—in which such a census is taken.

City governments have been encouraged to take special censuses of population under the supervision of a representative of the bureau. Such censuses have been taken since 1920 by Fairbury and Sycamore, Ill.; High Point, Greensboro, Hendersonville, and Mount Airy, N. C.; Fairfield, Ala.; Beckley, W. Va.; and Detroit, Mich.

CENSUS RECORDS

These records contain the name and other information (sex, age, nationality, etc.) concerning every individual as enumerated at each census from 1850 to 1920. From 1790 to and including the census of 1840, the name of the head of the family only was recorded, together with the number of persons in each family shown by certain age groups and by sex. The records for some of the censuses are incomplete because of loss or partial destruction by fire and water. The entire collection now consists of 15,050 volumes and some millions of schedules that are not bound but are wrapped in 9,161 packages. It contains invaluable records of the population

of the counties, cities, townships, etc., since the foundation of the Government.

There are other records of great value in the files of the bureau. If destroyed, none of them could be replaced. All of this invaluable material is stored in one of the temporary war buildings. The only fire protection is an automatic sprinkling system, which if put into action would be about as destructive to the records as fire would be.

The names of the heads of families enumerated at the census of 1790 have been listed and printed, together with such data as were recorded in regard to the number, sex, and age of other persons enumerated. (As already explained, the names of persons other than heads of families were not reported at that census.) I recommend, therefore, that the 27 volumes containing the schedules of 1790 be turned over to the Library of Congress or the Smithsonian Institution, where they can be put on display as records of great historical value.

TABULATING MACHINES

At the end of the year there were in the bureau 2,042 punching, calculating, adding, sorting, numbering, and tabulating machines. The large units of this equipment, namely, the electric sorting and tabulating machines, were invented, developed, and constructed in the mechanical laboratory of this bureau to meet the peculiar requirements of the statistical work of the census.

A number of the machines used in the population work at the last census have now been converted into adding tabulators (machines which tabulate and add numbers instead of merely tallying units) in order to make them suitable for other classes of work, and it is probable that others will be so changed to meet the increased requirements in the field. For this purpose, and also in order to have sufficient equipment for the next decennial census, work should be begun at once on the reconstruction of additional sorting and tabulating machines. Because of the accuracy and care necessary in the construction of certain parts of these machines, it is advisable to have them made in the bureau's mechanical laboratory, but the work in the laboratory should be supplemented by the manufacture of certain castings and parts on contract.

ECONOMIES

The demand for facts concerning industrial and social conditions is constantly broadening and becoming more insistent. To satisfy this demand, at least in part, and at the same time to continue to operate the bureau within the appropriations, it has been necessary to economize in every branch of the work. The saving of approximately \$500,000 in the cost of the agricultural canvass, already referred to (see "Census of agriculture"), is worthy of particular mention in this connection. Some of the changes suggested in my report for 1924 as necessary in order to meet existing conditions have been put into effect. Acting on the advice of persons familiar with the requirements in the various fields, a judicious selection of the facts to be reported has been made. Certain inquiries have been

curtailed and others extended. The net result has been to broaden the work in many respects. It should be recognized, however, that the work of the bureau tends continually to increase with the normal growth of population and industry. In order that this normal, normal, and reasonable increase may be maintained, corresponding increases in appropriations will be absolutely necessary. The annual appropriation for the current expenses of the bureau was, however, \$110,210 less for the fiscal year 1925 than for the fiscal year 1923.

OFFICE FORCE

Number of employees.—The office force at the close of June 30, 1925, comprised 689 officials, clerks, etc., 18 experts and assistants in the mechanical laboratory, 16 special agents, and 1,056 temporary employees (523 of whom were operatives paid on a piece-price basis) engaged in the work of the census of agriculture.

Appointments.—The total number of appointments (including reappointments, promotions, and all other changes in status except separations, but not including appointments for temporary work on the census of agriculture, 1925) made from July 1, 1924, to June 30, 1925, was 1,672, of which number 756 were appointments of clerks, 872 of operatives, and 44 of subclerical employees.

Promotions.—During the fiscal year 217 promotions were made, the majority of the increases amounting to only \$60 per annum. Much still remains to be done in the way of readjustment of salaries, but larger appropriations will, of course, be necessary before any increases that will materially benefit the employees can be made.

Separations.—The total number of persons separated from the service from July 1, 1924, to July 1, 1925, was 279. Of this number 239 resigned, 16 were transferred to other bureaus or departments, 6 were retired with annuities on account of age or disability, 8 died, 4 held limited appointments which expired, and 6 were separated by the termination of their services without prejudice.

Transfers within bureau.—In previous reports I have referred to a condition which exists in this bureau and which I believe has no parallel elsewhere in the Government service, namely, the continual transfer of employees from one of the main divisions to another and from one class of work to another within a division. In fact, the majority of the census positions do not carry definite and unchanging duties, and the value of the employees depends largely on their versatility and ability to take up one class of work after another. It is impossible to make any estimate of the changes in duties within the same division—they would doubtless number in the hundreds—but the records show the transfer of 485 employees from one main division to another during the past fiscal year. This means that the employees are frequently assigned temporarily to a higher or a lower grade of work. Those assigned to the higher grades of work appeal for changes in their classification grades, but in view of their temporary assignments and the appropriations available it is not always practicable to make such changes. The bureau is, therefore, encountering considerable difficulty in dealing with appeals, as well as in handling the efficiency ratings of employees whose duties and immediate supervisors are continually changing.

RECOMMENDATIONS FOR CHANGES IN CENSUS LAWS

Industrial and business statistics.—The value of statistics concerning the production, consumption, and stocks of commodities is now generally recognized, and there is a continually increasing demand for such statistics. I therefore renew the recommendation made in my report for 1924 that specific legislation be enacted authorizing their collection and compilation.

Cotton.—There is a continued demand for information concerning the quantities of the several grades of cotton held in the United States and elsewhere, and I therefore renew my recommendation for legislation providing for the grading and stapling of cotton. I also renew my recommendation for the repeal of the act of August 7, 1916, providing for the collection and publication of statistics of raw and prepared cotton and linters, cotton waste, and hull fiber consumed in the manufacture of guncotton and other explosives and of absorbent and medicated cotton.

Stocks of leaf tobacco.—I have frequently recommended that the act of Congress approved April 30, 1912, be amended so as to transfer to the Bureau of Internal Revenue the work of collecting and publishing statistics of stocks of leaf tobacco.

Marriage and divorce.—Statistics of marriage and divorce form an important part of the vital statistics of the United States and their value is very generally recognized. I recommend the enactment of a law providing that such statistics shall be collected annually and shall be published in connection with those for births and deaths now compiled by the Bureau of the Census.

Very truly yours,

W. M. STEUART,
Director of the Census.

BUREAU OF FOREIGN AND DOMESTIC COMMERCE

DEPARTMENT OF COMMERCE,
BUREAU OF FOREIGN AND DOMESTIC COMMERCE,
Washington, July 1, 1925.

HON. HERBERT HOOVER,
Secretary of Commerce.

DEAR MR. SECRETARY: In response to your request I furnish the following condensed report upon the work of the bureau during the fiscal year ended June 30, 1925:

The outstanding feature of the record is the really tremendous advance in the volume of services which the bureau furnished in response to the requests of American business men. The total for the fiscal year just ended was in excess of 2,000,000, the exact figure being 2,091,250. As compared with the year immediately preceding, the gain in the number of individual services performed was more than 850,000. And there is every reason to believe that, in dollars-and-cents results per inquiry answered, the service has been more practical, more efficacious, than ever before. It has been directed with the purpose of augmenting and facilitating the sale of American merchandise in all the regions of the world. Specific facts from a great variety of sources show that this object has been most amply attained. The recognition accorded to the work of the bureau is strikingly illustrated by the fact that, in a three-year period, the number of business men having recourse to its facilities has registered a fourfold increase.

Greater systematization has been introduced in every branch of the service. There has been a distinct "tightening up" all along the line—a concentration on essentials and an elimination of methods that seemed relatively ill-adapted to the particular aims in view. Important economies have been brought to bear. Two examples will serve to illustrate this tendency. In the important work of distributing special circulars, a thoroughgoing revision of the mailing lists and the introduction of other economies have brought about a 280 per cent increase in service with only a slight increase in the number of sheets mimeographed. In the Statistical Abstract of the United States the number of pages has been reduced about one-sixth, but, by various methods of condensation, the number of statistical items shown has been materially increased; the average number of items shown per page has been increased by one-third. There has been a constant effort to utilize the bureau's appropriations to the greatest possible advantage, and, by more adroit and precise methods of operation, to make them contribute more directly and substantially to the volume of American commerce and the profits accruing therefrom.

Ten new offices of the bureau abroad and two new district offices and four new cooperative offices in this country have been opened

during the past fiscal year. A new phase of activity is exemplified in the two exhaustive studies of domestic regional markets—the Philadelphia and Atlanta areas—which have been completed. A series of bulletins designed to improve retail trade practices has been issued—this, too, being a departure for our organization. A “standardization section” was established at Washington to perform work in connection with uniformity of specifications. These and other features of the bureau’s recent efforts are described in the following pages.

There have been many striking testimonials, during the past fiscal year, to the actual concrete results accomplished by the bureau’s efforts. For example, the bureau kept a record, from January 1 to May 6, 1925, of the amounts of business voluntarily reported by various concerns and explicitly attributed by them to one branch or another of the bureau’s organization. Only 59 firms out of the 22,000 currently served by the bureau are represented on this list, yet the sum of the business that they ascribe to the bureau is \$4,866,-296.72. Other outstanding instances of dollars-and-cents services to American business will be found throughout succeeding sections of this report.

OVERSEAS FIELD STAFF

GENERAL CHARACTERISTICS OF WORK

Each of the 40 foreign offices prepares periodic and special reports on trade topics; supplies information and advice in response to specific inquiries by letter; satisfies the requirements of those who call in person for trade data or for guidance; conducts such investigations as seem timely and appropriate under existing economic conditions; adjusts commercial disputes between foreign officials and firms on the one hand and American firms on the other; arbitrates difficulties where such service is requested; warns of any illegitimate phases of foreign competition or any possibly discriminatory proposals; and, in general, constantly facilitates such contacts and connections as will result in increased sales of American merchandise—whether fabricated goods, farm products, or other raw materials.

ACHIEVEMENTS OF REPRESENTATIVES IN EUROPE, AFRICA, AND CANADA

The activities of the bureau’s London office have steadily expanded during the year in response to increasing inquiries from American business. A more inclusive and intimate contact has been established with British commercial, financial, and industrial interests, and facilities have been improved for placing information at the disposal of inquirers. Visits to the various industrial and commercial centers of the United Kingdom have facilitated the gathering of first-hand information on market conditions and economic developments.

The services rendered by the London office have shown a marked increase. The number of inquiries answered during the year increased 35 per cent over 1924, and the 1,444 visitors who called at the office during 1924-25 represented an increase of more than 50

per cent over the previous year. Many of these visitors were American business men, and the London office has been particularly active in placing its facilities at the disposal of these callers. A total of 390 reports, including careful and thorough surveys of market and trade conditions in the United Kingdom, were made with a view to promoting the sale of American products. Specific services to American business interests have included trade-mark protection, the adjustment of patent discrepancies, and the location of suitable agents.

Among the market surveys prepared in the London office were several studies of conditions affecting leading American export commodities. In addition to these market analyses, a large number of financial, general economic, and miscellaneous reports have been prepared, of which the following are typical: "British financial conditions in 1924"; "British wool trade in 1924"; "American lumber shipments in British ports." The cable service from the London office now includes a semiannual survey of the position of American goods in the British market.

The output of the Paris office has materially increased. This office has received during the year an extraordinarily large number of callers who have, in many cases, been put in touch with local "contacts" from whom they obtained data or with whom they may establish business connections. Among the more important services by the Paris office during the year was that of keeping American business informed concerning the progress of the negotiations for a commercial treaty between France and Germany. Material assistance was also given in reporting in advance the projected changes in the French tariff. Disputes arising out of trade-mark abuses were in many cases adjusted by this office. American representation at an important international fair was arranged in collaboration with the American Chamber of Commerce in France. The reports from the Paris office included matter on the market for candles and paraffin, sales of American automobiles, the manufacture and sale of toilet preparations in France, the naval stores industry, the status of the French metallurgical industry, and wage and labor conditions in France. A number of reports were also made upon various market conditions and opportunities in Switzerland. Notes on special developments in French industry were also submitted, giving information regarding conditions not otherwise covered; such notes, averaging two pages in length, numbered about 800.

The continued improvement of the economic situation of Italy during the fiscal year offered an opportunity for the expansion of American trade, and the office of the commercial attaché at Rome took full advantage of this development. Much valuable information with regard to the possibilities of the market was furnished to American exporters, and advice was given regarding the most effective selling methods and terms of payment. Suitable representatives were found for a variety of American products. An electric power association was made aware of the advantages of the use of wood pipe, resulting in an inquiry involving \$300,000 worth of American manufactures. A war contract was settled to the advantage of an American firm by the payment of \$6,500, following representations made by the commercial attaché. More than 100 special reports have been submitted on subjects affecting American trade.

The service of the office has been extended by the appointment of an additional trade commissioner, with headquarters at Rome, who reports on all foodstuffs developments in the Mediterranean area.

A wide acquaintance among persons in Spain competent to represent American exporters made the services of the commercial attaché at Madrid particularly effective. Profitable markets were found for goods from the United States. The sale of an American trailer at a price 40 per cent above that at which the owner had been willing to sacrifice it, coupled with an order for an additional number of these articles, is an instance of such activities. An assistant trade commissioner in the Madrid office made personally a connection between a representative of a New York City electric company and a Spanish electric company, following which the American firm secured an order for \$50,000 worth of radio supplies monthly for a period of a year or more. Treaty negotiations between the United States and Spain were followed closely and reported in detail through the bureau and directly to American business.

During the fiscal year the Madrid office forwarded to the bureau 84 special reports.

Toward the end of the fiscal year the staff of the Brussels office was increased by the appointment of an additional trade commissioner, assigned to report on conditions affecting the tobacco trade in the whole of Europe. Monthly summaries of general conditions in Belgium not only were continued as a part of the material regularly published by this bureau, but were regarded as authoritative by the Belgian Government and were published in the official *Revue du Travail*. Developments in each important Belgian industry were carefully observed and reported upon weekly for the benefit of American business men. The office was especially active in lending its aid to American business men who called personally for advice in entering the Belgian market or in maintaining their trade connections there.

The number of callers at The Hague office seeking help in the promotion of sales of United States products increased steadily. Special reports written by this office covered a wide range of topics, giving valuable information on part-payment contracts, the importance of Germany in the Netherlands coal trade, the toilet-preparation industry and market, the market for candles and paraffin wax, the organization of the Dutch foreign-exchange market, bus transportation in the Netherlands, and the importance of inland waterways.

A marked increase in American exports and credits to Germany occurred upon the going into effect of the Dawes plan early in the fiscal year 1924-25. In this the Berlin office participated by rendering invaluable service to American business and banking interests. Millions of dollars of new business was secured by the establishment of a great number of new connections for our exporters, after thorough surveys of market possibilities and methods and the preparation of lists of the most desirable German agents. The reports on current changes, including the new taxation plan, the revalorization plan for paper-mark debts, the abolition of former financial restriction, and other measures have enabled American business men to take prompt advantage of possibilities in current developments. The

definite limits placed upon American imports into Germany by the import license system were given close attention, making possible sales of automobiles, office appliances, canned foodstuffs, etc., amounting to an increase exceeding \$15,000,000. The number of major reports submitted by the Berlin office increased from 86 in the fiscal year 1924 to 135 in 1925, while economic and trade notes mounted from 345 to 555.

A branch of the Berlin office was established in Hamburg, Germany, in October, 1924, in charge of a trade commissioner, and the staff was increased by the addition of an assistant trade commissioner in June, 1925. This office has specialized in foodstuffs, more particularly meats and fats, concerning which the trade commissioner sent in weekly market reports by cable from November to April, covering Germany, England, the Netherlands, Belgium, and Denmark. He also sent in periodical reports by mail on meats, fats, and foodstuffs covering all of Europe. On these subjects and many others he made special reports and answered many inquiries from the trade. Most of his time was spent in the work of trade promotion, especially in meats and fats in Germany, England, and other countries covered by his reports. In particular, he aided American packers in obtaining suitable agents and also in matters relating to the enforcement of the new British regulations on food preservatives.

The Vienna office, in connection with the several large Austrian loans that have been placed in the United States during the year, has aided bankers and negotiators with information on economic conditions of the country and its several States and municipalities, and has brought them in touch with Austrian officials, bankers, and business men. It has answered many inquiries from American business men, especially exporters, with reference to the Austrian market for their goods, its peculiar requirements, its commercial laws and usages; has secured agents for several American makes of automobiles and for different lines of foodstuffs, fiber, petroleum products, shoe polish, and many other manufactured articles; has shielded American business men in some cases from losses on bad checks, and has obtained permits for importation of their goods. It has brought about a satisfactory adjustment of a complaint of improper delivery of American machinery which threatened the prestige of American machine manufactures in Austria. It has induced the Austrian Government to relax its restrictions on the import of American automobiles and to remove at least one regulation that prevented American automobiles in bond from being exhibited to prospective purchasers. It assisted in closing an initial sale of \$25,000 worth of special American office appliances to the Federal Railways. The special reports from the Vienna office included such subjects as Government finance, foreign trade, commercial laws, conditions in various industries and trades, and the market for numerous American products.

The office at Prague, Czechoslovakia, has been successful, in a difficult situation, in obtaining permits for importation of American goods, particularly in the case of automobiles, radio sets, and small tractors. It has obtained favorable rulings as to tariff duties, particularly upon electrical appliances and automobiles, and has answered many inquiries, besides aiding visiting Americans with in-

formation as to the prevailing economic and marketing conditions in Czechoslovakia. Suitable agents were located for many lines of goods, particularly metals, automobiles, machinery, radio sets, cotton, and automatic lighting devices, and in one case the activities of the office aided materially in bringing about the sale of 10 automobiles. As a result of the assistance rendered by the office, an American tobacco firm received a contract to furnish a large quantity of tobacco to Czechoslovakia. Important service was rendered to American firms in the satisfactory adjustment of a number of trade difficulties with Czechoslovak concerns. During the year 50 special reports, 184 economic and trade notes, 35 trade opportunities, and 55 cablegrams, including 12 monthly economic cablegrams, have been submitted by the Prague office. The special reports included the following subjects: National and municipal finance, the prices and markets for numerous commodities, foreign trade, various industries, commercial treaties, and commercial and banking laws.

The bureau's office at Warsaw, Poland, brought to a successful conclusion the negotiations for the installation of a large radio plant by an American corporation, and has assisted another firm in beginning work on a large contract for water supply in four Polish cities. Assistance was given in the sale of American grain, and two large claims against Polish textile mills were satisfactorily adjusted through the intervention of the office. A number of direct sales by American firms were accomplished through the mediation of the commercial attaché. The Warsaw office sent in 73 special reports, in addition to the usual weekly reports and economic and trade notes. The Polish market for individual American commodities was covered in these reports, as well as the situation in the leading Polish industries, Polish foreign trade, crops, treaties between the Polish and other governments, and the international fair at Posnan. A special report dealt with the laws relating to application for patents and registration of designs and trade-marks in Poland.

The territory of the office at Riga, Latvia, now comprises Latvia, Esthonia, and Lithuania, a new office having been opened during the year in Finland. "Contact work" constituted the greater portion of the activities of the office. Assistance was rendered to the Latvian Government in connection with its five-year reconstruction plan. Numerous conferences were likewise held with the Government officials of the other two Baltic States. Much time was devoted to the preparation of reports on Baltic fiscal affairs and also on conditions in Russia. Special efforts were made by the office to introduce new lines of American merchandise, particularly radio equipment. The office has also endeavored, with considerable success, to extend the sale of established lines of commodities, especially automobiles. The office was instrumental in bringing several investment opportunities to the attention of American bankers.

The territory covered by the Copenhagen office was reduced to Denmark and Norway by the transfer of Sweden to the new Stockholm office. Particular attention was devoted to the preparation of major reports on Danish and Norwegian finances, banks, and important foreign-exchange developments. The number of American callers was much larger than during the previous year, and much

time and effort were devoted to assisting them in forming contacts or obtaining information. The commercial attaché made several trips of investigation in Norway and Sweden, interviewing trade contacts, Government officials, and American Government representatives. The office aided the Treasury by furnishing complete and detailed information on the affairs of the Issue Bank of the former Danish West Indies. Special attention was given to the matter of assisting American automotive manufacturers in extending sales in Denmark and Norway. Several trade disputes were handled by the office, and settlement was effected to the satisfaction of the parties involved. A large amount of research work was required to answer numerous general inquiries emanating from both official and private sources.

The bureau's office at Stockholm, Sweden, was opened October 1, 1924, and "contact work" has been a major necessity there. It has been one of the principal endeavors of this office to secure able representatives for American firms, and the efforts made in this direction have been productive of excellent results. Through the intervention of the Stockholm office a large shipment of apples, refused by the original consignee, was disposed of with a saving of time and money to the American shipper. Important information has been furnished to various commodity divisions of the bureau at Washington. Timely and valuable trade notes on Swedish developments were prepared. The office was instrumental in preventing a large increase in the import duty on American films. Assistance was given to the United States Shipping Board in securing outgoing cargo to the United States.

The Helsingfors office, opened September 10, 1924, furnished the bureau with direct and detailed reports on economic conditions and tendencies in Finland, as well as on market possibilities for specific commodities. The contact work was unusually extensive for a new office. Approximately 30 agency and purchase matters between American and Finnish firms were directly handled, out of which more than \$20,000 worth of business has already resulted, according to a conservative estimate based on inquiry among the firms in Finland concerned in the transactions. In addition, there were several agency arrangements pending at the close of the fiscal year.

Numerous claims of American creditors have been adjusted or brought nearer to settlement by the Bucharest office during the past year. American interests affected by the moratorium against foreign creditors, or by the new mining law, have been aided. Special attention was given to an analysis of the Rumanian market from the American point of view, the results being embodied in two special reports. Another investigation dealt with the importation of wheat by Rumania and a fourth with tobacco production. Extensive reports were prepared on "The new Rumanian import tariff," "Agrarian reform in Rumania," "The Rumanian budget," and "The nationalization of the petroleum industry," and periodical reports were also prepared on petroleum, agriculture, and lumber.

The trade commissioner in charge of the Constantinople office has kept American business men well acquainted with the shifting economic situation in Turkey, and by personal contact has rendered

valuable assistance to American concerns visiting Constantinople. The Constantinople office has paid particular attention to the tariff situation in Turkey and also to the introduction of American motion-picture films. This office has also aided the American High Commission to a very substantial extent. Attention was given to the adjustment of trade disputes and old accounts. The suboffice at Smyrna reported exhaustively on the fig and raisin industry. The Constantinople office has submitted a number of special reports, among which are "The economic policy of the new Turkish Republic," "Part-payment contracts in Turkey," "Organization of the Turkish exchange market," and "Industry and trade in toilet preparations in Turkey."

The office at Athens, Greece, has kept American business in close touch with conditions and has reported regularly on the two principal export industries of Greece—currants and tobacco. Members of the staff have visited eastern Peloponnesus and western Thrace to obtain first-hand information on general conditions, and Volo and Cavalla to investigate tobacco manipulation. At Cavalla substantial assistance was given the representatives of American companies there, who buy the better grade of tobacco for export to the United States. The Athens office rendered important services in connection with the securing of a large waterworks contract by an American concern. This single contract amounts to several millions of dollars. An important function of the Athens office has been to assist in the collection of American claims and the adjustment of overdue accounts. Among the special reports sent in during the year were "Market of Naxos emery," "Highway situation in Greece," "Greek market for farm machinery," "Greek fur trade," and "Greek organization of foreign exchange."

The bureau's office at Alexandria, Egypt, was opened in January, 1924, and pioneer work has naturally constituted its major effort. American business has been kept in close touch with the situation as regards cotton, this being the chief export product of Egypt. The office has also been painstaking in its efforts to inform American concerns regarding the shifting conditions affecting cotton piece goods. American representatives visiting Egypt have been assisted by the trade commissioner in charge. Among the special reports were "Egyptian market for toilet preparations," "Egyptian shoe industry and trade," "Trends in Egyptian cotton piece-goods demands," and "Competitive factors in trade of Egypt."

The work of the Johannesburg office has reflected a growing interest in the South African market on the part of American exporters and manufacturers. The office has answered 489 inquiries from American exporters during the years, and in many instances has secured suitable agents for American firms which, because of their unfamiliarity with the marketing methods customary in the Union of South Africa, were frequently dependent upon the recommendations of the Johannesburg office. As a single example of the type of concrete service rendered by the office, it may be mentioned that the trade commissioner personally made a South African connection for an American calculating-machine company, through which an initial order of \$1,650 was immediately placed with the

American concern, with strong indications of ultimate business in considerable volume. The trade commissioner has devoted particular attention to tariff matters, and, in this connection, was instrumental in procuring a modification of "antidumping" rulings against American products. American goods are well regarded in South African markets, and the Johannesburg office has devoted special attention to submitting a comprehensive market analysis setting forth the opportunities of interest to American exporters.

To meet the growing needs of American business men, the bureau opened an office at Ottawa, Canada, October 1, 1924. It has kept the American business community in close touch with the major phases of the industrial development and commercial trends of the Dominion. An important part of the work of the Ottawa office has been the answering of inquiries from American firms interested in the Canadian market. During the nine months of operation up to the end of the fiscal year, nearly 1,700 letters were written to outside firms and 1,610 informational letters were addressed to the bureau. Inquiries received from American exporters covered a wide range of subjects, including the markets for textiles, radio apparatus, crops, school equipment, scales, and advertising novelties. The office has closely followed pending trade agreements, matters relating to the sales tax, and customs regulations. It has furnished prompt and thorough reports on crop conditions, and these have been of great benefit to American interests. In a number of instances agency arrangements were concluded on behalf of United States firms, many opportunities for the sale of American commodities were made available, and active steps were taken to assist manufacturers in disposing of their products to advantage. The trade commissioner at Ottawa was instrumental in facilitating the purchase in the United States of \$300,000 worth of building material by a life insurance company at Ottawa. He also arranged for a Canadian agency to represent a New York City novelty company, resulting in sales of more than \$100,000 within a comparatively short period. As characteristic of what can be done even by a newly established office of the bureau, an experience of the Ottawa office may be cited. The office circularized 272 Canadian merchants, to ascertain whether they were considering the handling of additional American agencies. Replies were received from 106 firms (representing 39 per cent of the number addressed), of whom 86 wanted either to represent additional American manufacturers or to buy American goods outright.

FIELD REPRESENTATIVES IN THE FAR EAST

The preparation of material for the revised Commercial Handbook of China, which will be issued during the coming fiscal year, constituted one of the principal activities of the bureau's office at Peking. The representatives in charge were also constantly engaged in assisting and advising the American Legation in handling the details of American claims against the Chinese Government. Close contact was maintained with the business communities and American chambers of commerce at Tientsin, Mukden, Harbin, and Hankow.

Careful study was devoted to financial matters of the Chinese Government and to railway affairs. As a direct result of the assistance given by the Peking office to an American agricultural implements company, that firm booked an initial order with Gen. Feng Yu-Hsiang, special commissioner for the Northwest Territory embracing Mongolia and Chinese Turkestan, for two road tractors, one farm tractor, a threshing outfit, one rake, two grain drills, two trailers, three plows, two mowing machines, and two disk harrows. This was only one example of the concrete service rendered for the benefit of American interests.

The Shanghai office kept in close contact with the 285 American firms in that territory, as well as with the foreign and native firms handling American agencies. Specific assistance on the part of this office resulted in the actual placing of orders with American firms totaling upward of \$100,000. In one instance a manufacturer was saved a certain loss of approximately \$14,000 through the prompt action of the bureau's Shanghai office. The members of the Shanghai staff prepared 130 special reports on trade and economic subjects.

The office at Canton, China, was opened September 1, 1924, and the trade commissioner in charge has been very active in furthering American trade interests in Hongkong and Canton.

The outstanding feature of the work of the Tokyo office has been the large number of special reports and replies to questionnaires that were completed during the year. A new weekly cable service on general economic conditions was inaugurated, and the office submitted, in addition, weekly cable reports on lumber, rice, and cotton textiles. Through use of a new special code the monthly cable service was expanded and improved. An especially significant phase of the work at Tokyo has been in protecting American firms from trade-mark infringements. Through its prompt cable advices concerning contemplated infringements it has been enabled to save American firms, in many instances, from embarrassment and expense. The Tokyo office also has rendered valuable service in the adjustment of trade disputes arising from a large number of claims that grew out of the earthquake, and it has been instrumental in the placing of many American agencies with Japanese firms.

Through the direct efforts of the bureau's Australian organization, many new American agencies were established in the Commonwealth. As an instance of dollars-and-cents service, an American firm manufacturing player pianos and music rolls was able, with the assistance and advice of the American trade commissioner, to secure an order amounting to \$25,000, and a further order of \$100,000 is in view. Many letters of introduction were issued to Australian business men and Government officials contemplating visits to the United States. American salesmen and representatives were almost daily callers at the office, and were placed in touch with Australian business houses and Government purchasing agents. Among the many reports prepared by the Melbourne office during the year were "Market in Australia for toilet preparations," "Market for rubber specialties," "Naval stores," "Travelers' guide to Australia," "Travelers' guide to New Zealand," "Australian electric-supply system," "Survey of Australian automotive trade," etc. A new office was

opened by the bureau at Sydney on July 1, 1925, which, with the office at Melbourne, will be able to cover the Australian and New Zealand areas in a thorough manner.

The scarcity of American agencies in India compelled the bureau's representatives in that country to spend a considerable part of their time during the past year in investigating market possibilities and seeking out suitable sales outlets for American goods. A number of new connections made have been more than satisfactory. Among concrete results directly attributable to the bureau's activities may be mentioned an order for air compressors amounting to \$15,000 and one for a well-known American specialty to the value of \$10,000. Success was attained in having American branches registered and placed in position to do business with the purchasing departments of the Indian Government. Among the special reports submitted to the bureau, particular mention should be made of "Advertising in India," "Market for electric fans," "Market for jewelry," "Market for toilet requisites," "Automotive market review," "Alcohol," "Commercial travelers' guide," "Naval stores in India." The wide publicity given these studies aroused great interest in the Indian market.

The work of the bureau's office at Batavia, Java, during the first half of the fiscal year was largely devoted to a study of the general organization of public and private business in the Dutch East Indies and of the fundamental conditions upon which they rest. The trade commissioner developed contacts with Government, banking, and commercial interests and prepared reports on finance and the more important industries and commodities. Upon recommendations of the trade commissioner American firms placed a number of successful agencies, and one firm gave to an American concern a contract of a value of \$25,000. Various trade complaints were investigated and satisfactorily settled.

Special reports submitted by the Manila office covered, among others, the following subjects: "Construction plans in the Philippine Islands," "Automotive census," "Reorganization of the Philippine Bank," "Steamship services between the Philippines and the United States," and "The development of radiotelephony." Material for the Commerce Yearbook was revised, and, by special request, a business review of the islands for 1924 was prepared for a directory. The assistant trade commissioner (in charge) took an active part in local business affairs and made a tour of the southern islands of the archipelago during the latter part of the year to acquaint himself with the possibilities for their industrial development. The work of the Manila office was considerably lightened by cooperation on the part of the officials of the insular government, of the American Chamber of Commerce, and, most especially, of the Governor General's office, which made it a policy to confer with the bureau's representative in all trade matters.

ACTIVITIES OF FIELD REPRESENTATIVES IN LATIN AMERICA

On a number of occasions the office of the bureau at Buenos Aires has assisted American firms in obtaining valuable contracts and has

brought about favorable decisions for shippers on tariff rulings and other customs matters such as identification of merchandise and time for presentation of documents. Largely through the efforts of this office an American manufacturer was enabled to secure a contract from the municipality of Buenos Aires for the sale of automotive equipment valued at about half a million dollars. Assistance was rendered the Argentine representative of an American steel corporation in securing orders for galvanized steel sheets amounting to more than \$4,500,000. In another instance a manufacturer's agent, appointed through the Buenos Aires office as representative of large American textile mills, reported sales totaling \$60,000 in two months. The commercial attaché has taken an active part in arranging details for the Pan American Highways Conference to be held in October, 1925. Through close relations with municipal and Government officials, he has been in a position to render great service to American commercial travelers and their houses. Valuable and timely information relative to financial and economic projects in Argentina has been made available to American investors.

The office at Rio de Janeiro gave much attention to a study of the coffee market and was able to render valuable assistance to members of the American coffee trade in the price emergency. The office aided numerous American exporters in protecting their trade-marks and patents, while it helped others by obtaining for them responsible agents and representatives in Brazil. The satisfactory settlement of various commercial disputes between American and Brazilian firms was amicably consummated through the direct intervention of the commercial attaché and his assistants. Valuable orders were obtained by American exporters as a direct result of contacts made with the help of the Rio office. Constructive aid was given the representative of an American contracting company in its efforts to obtain contracts for extension of the water systems in Sao Paulo and public works in other parts of the Republic.

The office at Sao Paulo, Brazil, among its other services, gave concrete assistance to an American automobile firm and to a large manufacturer of American threshing machines by making contacts for them in Sao Paulo. Through its influence a preliminary order for electric stamping machinery was placed in the United States, despite lower German bids. Close cooperation was maintained with the American Chamber of Commerce; the trade commissioner was appointed chairman of the commerce committee of that organization, and, while acting in that capacity, was enabled to do considerable work in creating a greater interest in American agricultural machinery. Investigations for American bankers of railway building schemes and of a proposed improvement in the Sao Paulo water-supply system were carried out, and the bureau was kept in touch at all times with economic developments in the Sao Paulo district. Among other activities of the office of value to American business may be mentioned the adjustment of claims and the investigation of markets for specific articles.

Among the outstanding results influenced by the direct services of the bureau's office at Santiago, Chile, have been the sale of approxi-

mately \$25,000 worth of automobiles and \$12,000 worth of automobile accessories, \$7,000 worth of radio equipment, \$5,000 worth of rice, \$5,000 worth of musical instruments, and some \$11,000 worth of business in other lines, including refrigerating machinery, toys, scales, batteries, pistons, various kinds of textiles, electrical devices, and pencils. The placing of orders for tanning equipment totaling more than \$10,000 resulted from contacts made between a Santiago tanner and American manufacturers. The office brought about the payment of sums in excess of \$6,000 in the adjustment of claims and liquidation of accounts held against local firms and individuals by Americans. The friendly offices of the Santiago staff were extended in the settlement of numerous trade disputes and in the securing of valuable representations for American exporters. Aid was given to American manufacturers in the matter of protection for their trade-marks in Chile and in difficulties experienced in customhouse clearances. The commercial attaché made a trip through northern Chile and Bolivia in April, enabling him to give first-hand information to the bureau concerning trade conditions in those regions, particularly the activities of competitors of the United States and opportunities for increasing American trade. An assistant trade commissioner visited the agricultural regions of southern Chile and reported on conditions there.

The office at Lima, Peru, has been very active in informing the American business public, through reports to the bureau, of trade and economic developments, especially with reference to the possibilities of promoting American sales. On a great number of occasions help and guidance have been given to American travelers, particularly as regards the provisions of the commercial travelers' treaty between the United States and Peru, and close cooperation has been maintained with American business firms located in that country. Concrete results have been obtained in adjusting claims and differences arising from purchases of American commodities, while much valuable assistance has been given to American firms in cases of trade-mark piracy and in recovery on overpayments of customs duties. Information furnished by the office led to the purchase, by a large industrial corporation of Ilo, Peru, of American canning machinery and equipment to the value of \$10,500. Authorization was secured from the Peruvian Government for importations of American shoes into southern Peru, a region in which such importation is otherwise prohibited, resulting in the sale of hundreds of pairs of American shoes.

Though the bureau's office at Bogota, Colombia, had an unusually small staff, the work it has done has been of exceptional value. The letters and reports submitted have kept the bureau constantly informed regarding conditions in Colombia at a time when that country is of particular interest because of its activity in railroad building. This office was continually in touch with the representatives of various American firms who were in Colombia for the purpose of securing contracts from the Government for railroad equipment and material, and rendered substantial assistance to them in obtaining such contracts. In one instance it was largely through the efforts of the Bogota office that a representative of an American

company supplying structural steel secured a contract amounting to \$100,000 within a week after his arrival in Bogota. Probably the most outstanding feature of the year was the success of the commercial attaché in getting the Antioquia coffee growers to take steps to prevent the misbranding of "Antioquia" and "Medellin" coffee. It is estimated that the correction of this misbranding will save the American buyers of coffee more than half a million dollars a year. Material assistance was also given to many American manufacturers by replies to trade inquiries covering a wide range of subjects. The office was also used by the traveling representatives of American firms as a valuable source of reliable information.

Early in the year an office of the bureau was established in Montevideo, Uruguay. A great deal of time has necessarily been taken up in organizing the office, making contacts, and becoming familiar with the field through travel, but the trade commissioner has, nevertheless, been able to render valuable services to American firms, particularly in placing agencies, adjusting trade disputes, and advising as to opportunities for new business.

The proposed tariff changes in Cuba have received the careful attention and study of the Habana office and have been made the subject of several extensive reports. The staff has worked in close cooperation with the American Chamber of Commerce in this matter. Several changes and modifications in favor of American interests were made by the Cuban authorities; one in particular, relating to the thread count on textiles, was of considerable benefit to those interested in supplying the Cuban textile market. A large number of reports on specific commodities were submitted by the office and disseminated to American business men by the bureau. The new public-works project has received close attention, details have been furnished, and a continued close watch will be kept as the plan materializes and the possibility of new business opens up for American suppliers of the necessary materials. The labor situation, and especially the railroad problem, with its relation to the distribution of merchandise, continued to receive the attention of the office and was made the subject of several reports and shorter memoranda. The office received and replied to more than 350 inquiries from American business firms on a great variety of subjects and was of concrete assistance in the establishment of new business and the extension of existing lines. A number of trade disputes and claims were adjusted, one of these involving the successful resolution of the claim of an American company to the extent of \$11,000. The office was also instrumental in protecting the interests of American suppliers of cottonseed oil for use in bread making.

By reason of improved trade conditions and the widespread interest manifested by American manufacturers in Mexico, the work of the Mexico City office was unusually heavy during the year and it was able to render very substantial assistance to American firms and industries. During the year the office received nearly 2,000 callers (the greater number being American business men visiting Mexico), assisted in the settlement of trade disputes, answered many trade inquiries on a variety of subjects, and aided American manufacturers and exporters in numerous other ways. This office gave

material aid to a large American industrial plant that established a branch factory in Mexico City, assisting it in selecting a suitable site and in securing rail rates for its product. The commercial attaché worked in collaboration with the American commissioner of agriculture in Mexico City and succeeded in bringing about the raising of the quarantine against Texas cattle which allowed many thousand starving cattle to be sent from that State into Mexico for grazing. The office obtained a suspension of the order requiring consular fees to be levied on catalogue prices, and it was also successful in securing a reversal of the ruling holding that agents of American houses in Mexico selling on a commission basis were liable for the payment of the Mexican income tax on the business done in Mexico. Close and satisfactory cooperation was maintained with the embassy and consulate general, and there were most cordial relations with the American Chamber of Commerce in Mexico City.

Early in the fiscal year an office of the bureau was established in San Juan, P. R., under a trade commissioner who a short time before spent several months in the island making a trade survey and collecting material for a handbook. In its functions it partakes of the characteristics of both a foreign and a district office. A large number of World Trade Directory reports have been submitted, filling a long-felt want, as previously little information on Porto Rican firms had been available in the bureau. Work on the Porto Rico handbook has been continued. Besides submitting numerous market surveys and reports, which the bureau has published to the trade, the San Juan office wrote more than 1,000 trade letters to individuals and firms in the United States in response to inquiries addressed to it. It has also rendered concrete assistance to a number of American firms in the placing of agencies and in adjusting trade claims and disputes. A clerk in the San Juan office, after a visit to the Virgin Islands, submitted a comprehensive report on the principal business houses and on general trade and economic conditions in those islands.

Having established field offices in Cuba and Porto Rico, the bureau felt the necessity of taking steps to build up its files of information on the other West Indies, and more particularly the lesser islands, where consular offices are few. The aggregate of our trade with these islands is large, and in recent years they have been the field of keen activity on the part of foreign competitors. It was therefore determined to send a representative of the bureau to travel through this region, to report on trade and economic conditions, and to establish informational contacts. Since October 1, 1924, he has covered the Bahamas, Jamaica, Haiti, the Dominican Republic, and the Virgin and Leeward Islands. His trip has stimulated considerable interest on the part of American exporters, and the bureau is receiving an increasing number of inquiries from firms desiring his assistance in extending their business. The trade commissioner has sent in reports of an economic and commodity nature, the latter having to do principally with local industries. He has collected quantities of material for use in preparing publications concerning the islands and for the informational files and has made a number of valuable contacts, from which information can be secured from time to time

until the area shall be permanently covered by some central office. He has been instrumental in placing a number of agencies for American firms and in the adjustment of trade complaints and disputes. He has also cooperated with the American Chamber of Commerce in Haiti to the mutual benefit of that body and the bureau.

REGIONAL WORK AT WASHINGTON

As in previous years, all the regional divisions of the bureau have maintained regular sections in Commerce Reports; have prepared for that magazine monthly reviews of conditions in their respective territories, on the basis of cabled reports from the bureau's foreign representatives; have supervised, in general, the work of those representatives; have prepared and distributed confidential circulars; have disseminated data through commercial bodies, trade journals, and newspapers; have conducted a great volume of correspondence and aided many visitors; and have examined and utilized a mass of material appearing in foreign publications. Assistance has been given to commodity divisions with respect to numerous broad commercial problems.

The European division was created on July 15, 1924, by the consolidation of the Western European division and the Eastern European and Levantine division, the chief of the Western European division continuing as chief of the European division. The area covered by this division now includes all of Europe, all of Africa, the Near and Middle East to and including Turkey and Persia, and the Dominion of Canada.

Among the more important trade information bulletins published during the year, the one on The Reparation Problem was particularly well received. Studies of the Government finances of France, Greece, and Turkey were also published in this form, and two bulletins on African areas were issued. The European division participated especially in the Dawes report number of Commerce Reports, August 18, 1924, which was published immediately before the application of the Dawes plan, and in the Canadian number of September 2, 1924, the publication of which was approximately simultaneous with the opening of the bureau's office at Ottawa. Special articles in Commerce Reports during the year included "Analysis of German gold balance sheets," "Reconstruction of devastated areas in France," "German industrial debentures," and "British emigration and industry." On August 11, 1924, a weekly circular series, "European economic and trade developments," was inaugurated for distribution to the entire mailing list of the division, and since December 8, 1924, this service has also been incorporated as a special section in Commerce Reports. Among the special circulars prepared in the division during the year were "German banking during 1924," "Continued expansion of foreign trade in France," "Italy's favorable economic position at the end of 1924," and "The economic growth of Palestine."

The division has continued to supply the Department of State and the Federal Reserve Board with copies of articles for Commerce Reports based upon the monthly economic cablegrams received from foreign offices in Europe, Canada, and Africa, and has given

private circulation to a number of confidential circulars based upon similar sources.

Through its advisory committee—consisting of two bankers, three manufacturers, and an economist—and through chambers of commerce and trade associations, the division has kept itself well informed concerning the character of information on Europe in which American business is most interested.

Aside from its administrative duties, the work of the far eastern division has been largely devoted to the preparation of original material on economic matters pertaining to the Far East and to the revision and preparation of the reports received from field officers for dissemination to the American business world through the various channels of publication. Among the special efforts put forth by the bureau's staff at Washington have been five speeches delivered by the acting chief at business gatherings and over the radio; revision of 750,000 words of manuscript of the Commercial Handbook of China; revision of manuscript of 150,000 words and preparation of maps for the Commercial Travelers' Guide to the Far East; trade information bulletin on Changing Factors in China's Economic Life; eight special circulars on trade with China; two special circulars on "Hotels of the Far East" and "The commercial travelers' itinerary of the Far East"; 16 special articles on America's trade with various far eastern countries; and the 6 months' trip of investigation and inspection of Far Eastern offices by the chief of the division.

In addition to these are the special activities of the several regional sections. Among the outstanding things accomplished by the India-Australia section were a special India number of Commerce Reports; a trade information bulletin, India as a Market for American Goods; and eight special circulars on Indian, Hawaiian, and Australian markets. This section published during the year 150 trade notes, 50 special articles, 10-articles specially prepared for the press, and prepared or revised monographs on Australia, The Trends of Oriental Trade, and Analysis of the South Sea Island Trade for private business concerns.

The Japan-China section prepared 31 special articles for Commerce Reports, 60 trade notes and short articles, 30 press statements, and 4 special articles for newspaper publication, in addition to its other routine work. The Japan section of the Commercial Travelers' Guide to the Far East was completely revised and rewritten. Charts and graphs were prepared for use at various trade gatherings. Introductions were written to the Japan and China sections of both the Commerce Yearbook and the Commercial Travelers' Guide.

In addition to the usual reports and special articles, including many for newspaper publication, the southeastern Asia section completely rewrote the material for the Commercial Travelers' Guide on British Malaya, the Dutch East Indies, and Indo-China.

With a view to better administration and greater efficiency in its work, the Latin American division was reorganized early in the fiscal year. As a result it has been able to render more and better service without increasing its staff. Aside from the usual routine

in the collection and dissemination of information bearing on trade and economic conditions in its territory, the division has given its attention to numerous extraordinary conditions or events having a bearing on trade. Examples of these are: Labor troubles in Cuba and Mexico; the difficulties of American consumers with respect to coffee from Brazil, fibers from Mexico, and molasses from Cuba; port congestion at Rio de Janeiro and Santos, Brazil; commercial difficulties incident to unprecedented rains in the arid regions of Peru and Ecuador, and hurricanes in the West Indies; the reorganization of the Chilean Nitrate Association; colonization schemes in South America, etc.

During the year 356 articles prepared in the division were published in Commerce Reports. Thirteen trade information bulletins prepared in the division had been published or were in the course of publication at the close of the year, among them being a detailed review of the trade of the United States with Latin America in 1924 and studies of several countries as markets for American goods, the regions so covered being Mexico, Central America, Cuba, and the other West Indies, Colombia, Venezuela, the Amazon Valley, Bolivia, and Chile. At the close of the year material is being collected for similar bulletins to cover the remainder of the region.

The publication of the weekly mimeographed news bulletin, Latin America at a Glance, has been continued, amounting to some 200 pages in the 52 numbers. Special circulars were issued to the number of 25, covering such subjects as trade and economic conditions in Chile, Cuba, Honduras, and Paraguay, foreign trade of the Dutch West Indies, trade competition in Colombia, a trade survey of Brazil, per capita purchasing power of Latin America, the routing of commercial travelers through Latin American countries, and living and office-operating expenses in commercial centers of Latin America.

Considerable work was done in bringing up to date the statistics in the manuscript of the Commercial and Industrial Handbook of Peru. This was made necessary by the fact that, for a long time after the preparation of the manuscript, funds were not available for its publication. One of the largest single undertakings of the division during the year, with respect to publications, has been the revision of the Commercial Travelers' Guide to Latin America, which has just been completed.

COMMODITY DIVISIONS

FUNCTIONS AND SERVICES COMMON TO ALL COMMODITY DIVISIONS

The commodity divisions bring the bureau into direct and vital contact with producers interested in foreign commerce. They are constantly in touch with their respective trades, providing for each a highly specialized service which satisfies its own peculiar and characteristic needs. Essential data are quickly collected and disseminated. Each of the divisions has a thorough acquaintance with the technical phases of the industry, with its practices and problems, and with the executives who direct its operations.

An important feature of the work of these commodity divisions is their cooperation with more than 60 committees of trade associations or other representatives of American industry. Such committees act for a whole industry in laying out or putting through programs that promise to be advantageous; they summarize for the department the opinion of an industry; and they enable us to make information available in the most effective and concretely useful ways.

A very beneficial phase of activity is the sending out of data on Foreign Trade Opportunities—this data passing through the commodity divisions. The value of this work may be clearly demonstrated by citing a single instance. A check-up on the results of the Foreign Trade Opportunities on foodstuffs that were published during the first half of the fiscal year showed some really extraordinary results. During that period there were published 484 foodstuffs opportunities from 65 foreign countries. Requests from American firms in all parts of the country for this information averaged 6 per trade opportunity published. Business secured by American firms has been reported to the amount of \$1,898,789.06 for the half year, an average of \$3,923.12 per foodstuffs trade opportunity published, and of \$79,116.21 per firm of those obtaining and reporting this business.

As in past years, each of the commodity divisions has supplied material for a special section in Commerce Reports, has distributed numerous special circulars, and has also prepared questionnaires to be answered by Government representatives abroad. The commodity, like the regional, divisions have aided in the preparation of material for the Commerce Yearbook. Distinctive work accomplished by each division is described in the individual sections that follow.

AGRICULTURAL IMPLEMENTS DIVISION

A constantly increasing interest in foreign trade has been shown by members of the implement industry. As a result of the efforts of the bureau's agricultural implements division, one large firm placed a representative in India, and in one instance an order of \$40,000 has been reported in consequence of this activity, with excellent prospects for the future. The division has also assisted in securing agencies for American engines in Japan, pumps in Egypt, tractors in Australia, and other commodities in various countries. As in the past, the division maintained its principal contact with the National Association of Farm Equipment Manufacturers and strengthened and extended its contacts with individual firms.

The division completed the surveys on foreign markets for tractors, which aroused much interest and resulted in many cases in bringing American manufacturers and foreign distributors together through the assistance of the division. Surveys on incubators and brooders and on lawn mowers were also completed, and the information was distributed through special circulars. A survey of foreign markets for internal-combustion engines was nearing completion at the end of the year; 63 special circulars on this subject were distributed. In all, 202 special circulars were published during the year covering these surveys and also such subjects as "The dairy industry in

Argentina," "Market for animal-drawn vehicles in Porto Rico," "Market for dairy equipment in Great Britain," "Market for milking machines in Sweden," and "Purchase of cotton implements in Brazil."

Mimeographed circulars have been issued each month giving detailed figures on exports of implements. A series of implement and tractor notes has been issued irregularly. The 189 trade opportunities published by the division included, besides general inquiries for agricultural implements, many openings for specific articles such as tractors, engines, pumps, windmills, incubators and brooders, cotton implements, and dairy equipment.

Articles contributed by the division to Commerce Reports included a detailed analysis of exports of implements from the United States for the calendar year 1924 and studies of the implement markets of Canada, India, Argentina, Austria, Bulgaria, Czechoslovakia, Chile, Poland, Hungary, Yugoslavia, Mexico, and Italy. A discussion of the exports, with a table showing the totals exported to each country, was issued in a mimeographed circular, for which there was a keen demand. Material was prepared for a monograph on agricultural implements and equipment in Argentina. At the close of the fiscal year the division was beginning to receive from the field service replies to a questionnaire on foreign markets for spraying and dusting equipment. A questionnaire covering markets for threshers is now being prepared.

AUTOMOTIVE DIVISION

To obtain direct information on foreign competition the chief of the automotive division visited nine European countries, inspecting plants, attending exhibitions, and interviewing officials, manufacturers, and dealers. As a result valuable information has been made available for American interests. Direct contacts with American manufacturers by representatives of the division increased the opportunities for the giving of valuable sales aid and the rendering of other services. Members of the division have participated in the Pan American Road Congress, the National Conference on Street and Highway Safety, numerous conferences with trade committees on foreign tariffs and discriminations, meetings with the Tariff Commission, the reception to members of the Mexican automotive delegation, a gathering of the Automotive Equipment Association, and meetings of the division of simplified practice. Conferences have been held with officials of the National Automobile Chamber of Commerce, the Motor and Accessory Manufacturers' Association, the National Association of Engine and Boat Manufacturers, and the Motor Cycle and Allied Trades Association. Special information has been furnished various legislative and executive departments on exportations, importations, tariff restrictions (in collaboration with the tariff division), labor, consumption of material, use of motor cars, etc. The division has organized meetings on export trade and on rearrangement and improvement of export statistics.

The division brought about a standardization in the reports of the Government's foreign representatives with respect to automotive matters, securing better statistical information of foreign manufacture, sale, and distribution.

The special publications prepared and issued by the division during the year included World Automotive Census of 1924; Glossary of Automotive Terms and Instructions to Exporters; Automotive Exports and Imports of Principal Manufacturing Countries; monthly, quarterly, semiannual, and annual analysis of exports, United States and Canada; guide outline for foreign offices of the Government; exhibits of literature of European manufacturers of small cars; questionnaire on motor-bus transportation abroad; reprints of specially compiled articles on "Automobile tariffs and taxes in foreign countries" and "Automotive exports for 1924."

In August, 1924, the division initiated the policy of confining its contributions to Commerce Reports to general articles and reviews, arranging that items of special automotive trade interest be issued in a weekly "Automotive Market News Bulletin" and in special circulars. The "Foreign Trade Manual" was further improved, features were added, exporters' requirements were anticipated, and the subscription list was substantially increased.

Actual sales brought about (wholly or in part) through the efforts of the division were numerous during the fiscal year just past. They included 156 accounts opened by a New York automotive firm solely from names supplied by the bureau (this particular case dates from "the early months of 1923"); \$408,057 worth of trucks and flushers purchased by the city of Buenos Aires (aid given by the division, in collaboration with the office of the commercial attaché in Argentina); and purchases totaling \$6,000 by a firm in Medan, Sumatra.

CHEMICAL DIVISION

The building up of informational material and the establishing of basic reference files have gone on continuously in the chemical division, the contacts with industry have been enlarged and made more intimate, and the division is playing a much more important part in the economic life of the chemical industry. An example of this fact is afforded by the results of the division's service on China wood oil, inaugurated a year previously. The industry is on record as stating that the division's activities in this respect are accountable for lower and more uniform prices of this essential raw material and that the resulting saving has run into millions of dollars.

The division has established a predetermined outline of special articles covering the chemical trade in foreign countries, appearing in sequence in Commerce Reports. The weekly chemical bulletin has been maintained and improved. Seventy-four special circulars were issued; one of these outlined in detail the manufacture of synthetic methyl alcohol in Germany, calling the attention of the American wood-chemical industry to a development of the greatest significance.

Trade information bulletins included The French Dyestuffs Industry; The Nitrogen Situation in European Countries; Quinine Production and Marketing; Fertilizers: Production, Consumption, and Trade in Various Foreign Countries; Paints, Pigments, and Varnishes in the West Indies; World Trade in Toilet Preparations: Part 1, Europe. There was a comprehensive survey of the domestic distribution of paints and varnishes.

The chemical division collaborated with other divisions in such studies as that of the world trade in chromite and of the coal-tar dye situation in the calf-leather tanning industry in the United States and Europe. The division cooperated in the application of simplified practice in the paint and varnish and drug industries. For the naval-stores industry a series of special statistical and news-reporting services was arranged. An extensive survey on potash has been under way during the greater part of the year.

The number of statements of American chemical imports issued by the bureau was increased from 4 to 20 and of exports from 11 to 17.

An important development was the establishment and first meeting of the chemical advisory committee, a liaison between the bureau and the chemical industry.

Among many examples of direct trade promotion there may be cited the sale of several lots of American industrial chemicals to German interests, as well as the establishment by the chemical division of sources of supply for many raw materials urgently needed in this country. One New York chemical corporation estimates that it has obtained \$50,000 worth of foreign orders in consequence (directly or indirectly) of services rendered by the bureau.

COAL DIVISION

The work of the coal division increased materially during the fiscal year, the number of special circulars issued being more than four times as many as in the preceding year and the correspondence being nearly 50 per cent greater than in 1923-24. The work of maintaining current statistical tables covering domestic production, distribution, and prices, ocean freight rates, and the production, imports, exports, and prices of coals in foreign countries has been continued and enlarged. Special confidential information concerning foreign trade opportunities is distributed to 266 firms and individuals. Two monthly reports, going to 450 persons, are issued regularly, one giving a general survey of conditions in the coal trade of the United States and the other a summary of the export coal situation.

The preparation of material for the publication of a coal exporters' manual has been practically completed. Under the chairmanship of the chief of the coal division there was formed a committee composed of representatives from those branches of the Government interested in the coal industry (the Geological Survey, the Bureau of Mines, the Labor Department's Bureau of Statistics, the Bureau of the Census, and the coal division of this bureau) to make a study of the statistics relating to the industry now being collected by the Federal Government and to submit recommendations as to the data that it would be desirable to obtain in the future in order to promote the interests of the public, the Government, and the coal industry. This committee made a thorough study of the whole situation and submitted its report to the Secretary of Commerce.

The chief of the coal division has made, for the Secretary of Commerce, a study of the possible administrative changes required

for the best service to the industry and the public in fitting into the department's organization the functions of the Bureau of Mines, now transferred to the Department of Commerce.

ELECTRICAL EQUIPMENT DIVISION

The electrical equipment division has devoted a great deal of effort to the maintaining of up-to-date information on radio market possibilities, governmental restrictions, and broadcasting service in all countries of the world, this being a very essential service because of the pronounced activity in the radio field and the consequent flood of inquiries coming to the bureau. A great number of mimeographed circulars were issued directly to manufacturers of radio equipment, besides material supplied to the trade and general press.

A world survey of electric wiring practices and of the market for American products in this class was completed during the year, and detailed facts were disseminated to the industry. Wide circulation was given to a series of reports on the application of electricity to agriculture in those foreign countries where real work has been done along that line.

In cooperation with the division of foreign tariffs, there was undertaken the preparation of a series of studies of the duties imposed by certain foreign countries on a long list of specific electrical products; a report has been issued for Australia, and material for Argentina and India has been prepared for checking by the tariff division.

Throughout the year the division regularly kept up to date its directory of central stations, preparing, at the same time, condensed lists for certain countries for loan to manufacturers. The division continued to advertise and sell, through the Chicago and New York district offices of the bureau, sets of specifications for electrical equipment being bought by the Electricity Commission of the State of Victoria, Australia. Specifications were handled also for projects in various countries throughout the world, such as Egypt, Uruguay, and the Commonwealth of Australia.

The division responded to a considerably increased number of requests for recommendations as to markets for specific lines, advice on sales policies in different countries, and personal suggestions as to foreign representatives and the like. In a number of instances the division has placed American engineering firms in touch with large construction projects abroad and has worked closely with organizations interested in bidding on such work.

The chief of the division spent four and one-half months on a trip through Venezuela, Colombia, Central America, and Mexico, as a result of which much definite information is being made available to American manufacturers regarding the kinds of electrical products that can be sold, foreign competition, relative sales efficiency of dealers, and other merchandising data.

The concrete value of the bureau's services to the electrical industry is attested by the fact that various firms have written in, stating that they consider its efforts responsible for foreign sales amounting, respectively, to \$30,000, \$7,000, \$10,000, \$5,000, etc.

FOODSTUFFS DIVISION

An increase of 65 per cent in the outgoing correspondence marked the work of the foodstuffs division during the fiscal year just past, indicating a very substantial growth in this branch of the bureau's service.

Two new specialists were appointed for service abroad, one with headquarters at Hamburg, Germany, who covers the foreign situation as regards meats, fats, oils, and livestock; and the other with headquarters at Brussels, Belgium, who reports on the tobacco markets of Europe. These men spend about half their time visiting the important marketing centers, to get first-hand information, which, with that furnished by the other two foodstuffs specialists in Europe, is passed on, through the division at Washington, to American interests.

The world survey of agricultural products undertaken in 1923 has shown rapid development during the past fiscal year in the publication of the following bulletins: Marketing Canadian Wheat, Relation Between Value and Volume of Agricultural Exports, Marketing Cotton for Export, International Trade in Raw Silk, International Trade in Minor Fibers, International Trade in Wool, International Trade in Cotton, Marketing of American Meat Products in Export Trade, International Trade in Wheat and Flour, and Seasonal Aspects of Wheat Exporting. Other bulletins issued by this division have included: The Chinese Market for American Foodstuffs and The Cuban Market for American Foodstuffs (bulletins covering other important trade areas are now being prepared); International Trade in Leaf and Manufactured Tobacco; Tobacco Trade of the Scandinavian Countries; Tobacco Trade of Spain, Portugal, and the Canary Islands; Markets for Canned Foods in the Western Hemisphere; World Trade in Canned Salmon; Market for Nonintoxicating Beverages in Latin America; Markets for Flour in Central America; three bulletins of a series on Foreign Markets for Confectionery, covering (1) Latin America, (2) the Far East, and (3) Europe, Canada, the Near East, and Africa.

There has been a rapid expansion in the various sections of the informational statement entitled "Foodstuffs 'Round the World," which is sent to newspapers, trade papers, business concerns, trade associations, and individuals. Eight sections are now issued weekly, semimonthly, or monthly, as the case demands.

During the past year considerable stress has been laid on the development of information on the minor commodities, such as dairy products, fruits, vegetables, and tropical products.

HIDE AND LEATHER DIVISION

There was an increase of 115 per cent in the number of special and confidential circulars distributed during the year by the hide and leather division of the bureau, being indicative of a marked growth in the volume of all phases of the work and in the practical assistance afforded to the industry.

The division assisted in the securing of a great many new agencies and direct orders. Trade-information bulletins published included

World Trade in Chromite and The Quebracho Industry, the latter of which has already had a far-reaching influence. Much time was spent in contributing to the Senate document entitled "The Calf Leather Industry." Special reports were made to the four major groups of the industry relative to world markets for sole leather, side upper leather, calf and kip upper leather, and goat and kid upper leather. A new feature of the statistical service was the publication of charts showing, at a glance, the complete situation in the cattle-leather, calf-upper, goat and kid, and sheep and lamb industries. The reindeer industry of Alaska has received considerable attention from the standpoint of the future supply of reindeer skins for the American industry. Advice has been given on methods of take-off, grading, and merchandising, and interest on the part of the tanning industry has been stimulated. In cooperation with the calf-upper-leather group some detailed surveys of foreign markets were prepared and distributed.

The division has worked with various branches of the War Department throughout the year. Through the cooperation of the Quartermaster Corps much preliminary work was done in planning leather procurement in time of national emergency. In conjunction with the Chemical Warfare Service the procurement of special leather for gas masks was arranged. Scores of personal advisory conferences were held in the field with concerns relating to their individual foreign-trade problems. Through the cooperation of the Bureau of Standards the results of analyses of foreign leather and of new tanning materials were placed in circulation. Through the expert advisors on tanning materials several projects are being studied for the growing of vegetable tanning materials in strategic and accessible areas.

INDUSTRIAL MACHINERY DIVISION

One of the activities of the industrial machinery division has been that of making available to American interests the important information gathered by the chief of the division during a tour of investigation of the European markets. Special interest has been shown in the German market, which is now regaining a good deal of its former status as a field for the sale of American machinery. The division has also made special studies regarding the machinery possibilities in various other foreign countries, the effect of European competition on the machinery trade of this country, and business practices appropriate in connection with the sale of machinery in foreign countries; these have apparently proved of great value to Americans interested in exporting mechanical equipment.

Many American machinery manufacturers have been given assistance in the handling of their export problems, especially in finding better channels in all foreign markets for the disposition of their products. There have been a large number of requests for information as to the laws of foreign countries controlling the construction and installation of steam boilers, and the division's file of such data has been in constant demand.

There has been much work with regard to Pan American highway matters, especially in connection with the delegation representing 19 Latin American Republics which visited the United States to study American methods of road construction, the equipment employed, etc. The division has also handled matters having to do with construction projects of various sorts in foreign countries, reporting the particulars to interested American manufacturers. A series of trade information bulletins and mimeographed circulars have been issued describing ice-making and cold-storage plants in various parts of the world, in an effort to provide a complete picture of these facilities for all Americans interested in refrigerated products and their transportation.

The character of the concrete results obtained by business men through the efforts of the division may be illustrated by a single instance. A firm of engine builders writes that their export business has been nearly doubled through the help of the bureau. They estimate the business thus obtained at about \$60,000 and say that the repeat business that they will receive this year from these accounts will easily equal or surpass that amount.

IRON AND STEEL DIVISION

The number of services rendered by the bureau and its district offices with respect to all of the commodities handled by the iron-steel-hardware division more than doubled in the past fiscal year as compared with the preceding one. Inquiries concerning hardware, a class of commodities which was transferred to the sphere of this division's activities in May, 1924, accounted in large measure for this remarkable gain. Hardware items comprise at least half of the requests addressed to the division now.

Early in the year an advisory committee was organized among manufacturers of a diversified line of hardware who are actively engaged in export trade. This committee, comprising 14 exporting officials and the chief of the division, has met several times and has afforded important aid in the solution of hardware problems.

Among the new services inaugurated during the year the following may be cited: (1) Studies were made of the trade in metal lath, alloy steel bars, horseshoes and horseshoe nails, card clothing, wood screws, and other steel specialties, and the results were distributed in mimeographed form among the manufacturers concerned. (2) The world's leading markets for iron and steel products were analyzed for exporters. (3) Graphs and charts were made to show the world's production of pig iron and ingot steel by countries, and the position of the United States in respect to exports of iron and steel in comparison with the performances of other steel-producing countries. (4) A biweekly hardware bulletin, including pertinent items bearing on foreign marketing possibilities, competitive price information, construction projects of particular importance involving the use of hardware, etc., has been given regularly to the hardware trade. (5) Special confidential surveys were issued treating at considerable length of subjects of particular interest to the hardware-exporting trade.

Outlines were prepared for the direction of the foreign representatives of the bureau in their investigations of subjects of vital interest to American manufacturers of iron, steel, and hardware. These included surveys on cast-iron pipe, alloy and tool steels, shoring devices used in concrete building construction, derailing devices, tool grinders, abrasive grains, cast aluminum ware, builders' hardware, water filters, fly screens, expansion units, vault doors, oil-pressure stoves, restaurant and hotel equipment, brooms, hayforks, and other hardware items.

Trade information bulletins issued by the division have included Italy's Foreign Trade in Iron and Steel, Austrian Iron and Steel Industry and Trade, Canadian Iron and Steel Industry, and World Trade in Chromite. Special circulars were prepared to the number of 116.

LUMBER DIVISION

An outstanding activity on the part of the lumber division was the conclusion of the European field investigation and the preparation of major reports on the markets for American lumber in the Netherlands, France, Belgium, and Switzerland; these reports have been accorded warm praise by the industry. The division arranged for special lumber service in northwestern Europe for the purpose of gathering up-to-date market reports, checking up on claims, preparing trade lists and sales information, etc.; this service will be headed by a lumber trade commissioner, who will start for Europe early in the new fiscal year.

International lumber statistics were prepared in the form of distribution maps and charts, emphasis being laid on the American lumber export trade; more than 15,000 copies of each chart and map were distributed. An educational campaign in favor of grade marking of lumber was conducted on the basis of personal investigation in foreign countries where grade marking is practiced; various articles on the subject have been prepared for the press, in addition to a bulletin, of which 54,000 copies were ordered before it was issued.

Secretary Hoover's National Committee on Wood Utilization has made use of the services of the lumber division to a considerable extent. The division has started the compilation of a bibliography covering wood-utilization data in this country. A field survey in the United States has been conducted to determine the uses of short-length lumber in building and other construction. Special investigation has also been made in regard to gang sawing of lumber with particular reference to the utilization of top logs; a survey of foreign conditions surrounding the gang sawing of lumber has been made in this connection.

The connecting of American exporters with foreign agents has been of major importance. The division has a record of more than 50 successful agencies which it has arranged and estimates that more than \$50,000 has been saved to American exporters by this activity alone.

In several instances the lumber division has warned American exporters against unsound concerns abroad, enabling the exporters to take necessary precautions through credit insurance or otherwise.

In one instance more than \$100,000 was saved. The division is also informing American exporters of the standing of prospective foreign customers before any deals have been consummated.

Through a reciprocal arrangement the lumber division obtains confidential information from foreign countries regarding export of lumber and market prices. Through the assistance of the United States Government field officers a special survey has been made in regard to foreign markets for plywood, veneer, poles, cigar-box material, and railroad ties. In addition the division has carried on the program laid down when it was established, covering general collection and dissemination of foreign-trade information. Aside from its weekly contribution to Commerce Reports it has released once a week a lumber press service entitled "Lumber the World Over." The number of special circulars sent to lumber firms during the fiscal year was 271. These circulars are distributed through 90 special mailing lists averaging 300 firms each. The Pacific coast has been covered by special lumber-news service distributed through our district offices. Publications issued include the Lumber Market in the Netherlands (233 pages), the Lumber Industry of Chile, and a trade information bulletin on the Philippine Lumber Industry.

The division has reorganized and enlarged its export advisory committee, which consists of 47 members, largely appointed by various lumber associations cooperating with the division.

The practical dollars-and-cents value of the division's services may be illustrated by citing only two examples out of many—that of a firm in the Northwest which credits to the bureau's efforts \$287,332 worth of foreign business obtained, saying "We are indebted to your office for this connection, and it was through your splendid cooperation that this business has been secured"; and another concern in the same region, which attributed \$16,106 worth of business in Europe to the activities of the bureau.

MINERALS DIVISION

The minerals division was organized at the beginning of the fiscal year (July 1, 1924) to take over the work formerly handled by the petroleum division and the minerals section of the iron and steel division. This change was made in the interest of more efficient administration. The new division has handled information relating to the promotion of foreign trade in petroleum products and in the various nonferrous metal and mineral groups of commodities.

The division inaugurated a weekly mimeographed circular, "Foreign Trade Notes," covering items of interest to the petroleum trade and to the mineral industry on alternate weeks; this has reduced appreciably the routine correspondence. There has also been initiated a monthly cement bulletin, giving detailed statistics of the cement import and export trade. A quarterly report has been issued on foreign gasoline prices, covering all the principal world markets. Several series of special circulars have been continued during the year, representative subjects being "Mexican petroleum exports and production," "The Curacao petroleum industry," "Venezuelan petroleum exports," etc. Other circulars covered the nonferrous-metal

industry of Austria, "Platinum in Colombia," "The German copper market," etc.

A questionnaire was issued to the bureau's foreign offices for data on the market for paraffin wax and candles; 29 replies have been received and published as special circulars. Trade-information bulletins were published on Petroleum in Brazil and on the Petroleum Industry of Russia. A bulletin on the Petroleum Trade of China was also prepared, to be printed after the close of the fiscal year. The petroleum section began a series of world surveys of the trade in individual commodities, the first of these being the monograph on World Trade in Gasoline. Other bulletins for which material has been prepared include World Trade in Lead, Aluminum Trade of the World, and The Diamond Industry.

The chief of the minerals division has served on the technical committee of the Oil Conservation Board, and the division has done a very considerable amount of work in that connection.

PAPER DIVISION

Many concerns manufacturing flat papers as well as paper specialties, such as drinking cups, paper dishes, boxes of all sorts, cores, papeteries, envelopes, etc., were actively aided by the paper division in finding foreign markets for their products. They were constantly kept informed as to changes in market conditions, trade customs, and other particulars. Conditions affecting our principal competitors were favorable to the expansion of American trade in this line.

The division began a detailed investigation of markets abroad for printing machinery and accessories, as well as for printing inks; part of the results have been made available for persons interested in the exportation of these articles. In addition, a comprehensive survey of the pulp and paper resources, production, and trade of each of the world's paper-producing countries was begun; some of the results of this survey have likewise been published, although it will not be completed for several months.

Closer contacts have been established with the Forest Service and the Bureau of Standards in an endeavor to supplement the sources of information available to concerns and individuals with special or technical problems to solve.

A number of concerns just entering export markets were effectively aided by the division, which investigated possible markets for their products and helped them to make suitable connections abroad. Among these was one company, which has developed a \$10,000 business almost solely through the bureau's services; by that means an order for 600,000 fiber spoons was obtained from one concern in London alone, with the possibility of additional orders in the near future. Two other American firms attribute to the bureau's efforts foreign business amounting to \$30,000 and \$10,000, respectively. Still another firm writes:

Through the kind cooperation of the Bureau of Foreign and Domestic Commerce we were able to establish three new agencies; the ultimate value of these connections can not be expressed in terms of dollars and cents, but we feel confident that within the next few years it will amount to approximately \$50,000.

Wide distribution among paper exporters has been given to a Glossary of Paper Terms, prepared by the paper division, definitely fixing the tariff classification of practically all paper items entering into American export and import trade.

Eighty-five special circulars were released by the division, and a new service in the form of a weekly news letter to the trade was instituted. In these letters have appeared 382 items of immediate interest to the trade. All of these have also appeared in trade magazines and newspapers.

RUBBER DIVISION

Important work on crude rubber, particularly in connection with the survey of the possibilities of developing the rubber plantation industry in the Philippine Islands or in Latin America, was continued in the crude rubber section of the rubber division during the past fiscal year. An important and very comprehensive report on The Plantation Rubber Industry in the Middle East was published in monograph form. Other reports which were prepared, and which will come from the press early in the new fiscal year, were Possibilities for Para Rubber Production in the Philippine Islands and Rubber Production in the Amazon Valley. A fourth report, covering the possibilities in the countries of the Caribbean region, is being worked up in the division.

The rubber products section of the division initiated new services in addition to continuing and extending its regular program of supplying basic and current information regarding export markets for rubber products to American exporters.

Since the division's series of export handbooks of basic information affecting the importation of rubber goods in all foreign countries were in need of a general revision it was decided to convert them into a set of four loose-leaf manuals, and the necessary work was largely accomplished during the year. The export manual for rubber-tire exporters, containing 400 pages of basic information on 100 territories, was completed and issued. The manual for exporters of rubber footwear and clothing was practically ready for distribution at the end of the fiscal year, while the volume for exporters of mechanical rubber goods had been more than half written.

The series of tariff circulars issued by this division in collaboration with the division of foreign tariffs, showing tariff rates applicable to rubber goods imported into all countries, has been completed and issued in the form of a loose-leaf manual.

The most important new service undertaken was the compilation of semiannual reports showing stocks of automobile tires in hands of dealers throughout the United States. Surveys were made as of October 1, 1924, and April 1, 1925, the results of which, covering 27,000 and 35,000 dealers, respectively, were promptly released to the trade and were stated by manufacturers to be of great benefit in helping them to plan production schedules.

The statistical services of the division were expanded through the assistance of the Rubber Association of America (Inc.), by the purchase of monthly official statistics covering British and French exports of automobile tires and rubber footwear. Similar Canadian

statistics were secured through the bureau's Ottawa office and Italian tire-export statistics (quarterly) through the Rome office. The monthly statistics are released regularly through special circulars, comparative statements of tire exports from all producing countries to all foreign markets being released quarterly. The regular statistical services of the division, including the preparation and distribution of monthly statistics of United States exports of rubber goods of all classes, has also been continued in cooperation with the statistical division.

Special campaigns to increase American export trade in rubber belting, rubber heels and soles, and rubber specialties were undertaken during the year; data on foreign markets have been issued in the form of special circulars. The total number of circulars issued by the division was 401, as compared with 313 in the fiscal year 1924, 168 in 1923, and 52 in 1922. The assistant chief of the division has prepared, in connection with the belting campaign, a report on *The International Trade in Machinery Belting*, which is being published as Trade Promotion Series No. 22.

In April, 1925, the chief of the division started on a personal investigation of rubber-growing possibilities in Haiti, and in the course of his journey reviewed the markets for rubber products in British, Dutch, and French Guiana, and the island of Trinidad, returning June 10.

Commerce Reports has carried regular monthly, semiannual, and annual reviews and interpretations of American export statistics, while other representative articles contributed to the magazine include "Trend in international trade in automobile tires," "American rubber-heel industry and export trade," "Production and use of reclaimed rubber," etc.

The division has been successful in finding agents for several rubber manufacturers through the medium of the bureau's foreign offices.

SHOE AND LEATHER MANUFACTURES DIVISION

The rapid advance in the work of the shoe and leather manufactures division is illustrated by the fact that the correspondence during the last six months of the year showed an increase of 136 per cent over the volume for the first six months. Current information regarding foreign markets for boots and shoes and leather manufactured goods has been disseminated to the industries through 135 mimeographed special circulars and trade information bulletins. Monthly presentations and interpretations of import and export statistics and digests of reports received from commercial attachés, trade commissioners, and consuls concerning the markets in various countries for footwear and allied commodities have been published in Commerce Reports.

Many opportunities to sell leather manufactured goods in foreign countries have been brought to the attention of manufacturers and exporters. The division, in cooperation with the rubber division, has been making a world survey of markets for American belting. A world survey of markets for shoe polishes was undertaken; this is now completed, and the data will soon be issued in the form of

a trade information bulletin. For the Interdepartmental Committee on Index Numbers the division obtained complete information from the boot and shoe industry regarding the number of working days per annum and the number of productive hours operated per day.

The division has been cooperating with the division of domestic commerce in a survey of prison industries in their relation to outside industries. It has maintained close contact with other official and semiofficial bodies in Washington, with committees of nine trade organizations and with individual manufacturers.

SPECIALTIES DIVISION

The specialties division of the bureau handles about 20 major groups of commodities, some of the leading ones being business equipment, furniture, ceramics, sanitary ware, musical merchandise, jewelry, sporting goods, motion pictures, photographic goods, toys, and professional and scientific instruments. It has contacts with trade associations representing distinct groups, as well as with individual manufacturers. A saving to a large number of exporters has resulted because the division was able to show them better ways of carrying on their foreign business, testing out markets, and planning their export programs more efficiently. As a direct result of this merchandising and sales service, 15 specialty manufacturers increased their foreign sales during 1924 anywhere from \$700 to \$75,000. The total increase in sales for these 15 manufacturers, who are only a few of those served in the same way, amounted to \$229,390. Another example of service was in the case of a firm in the Far East which desired to purchase modern hotel equipment; this concern was put in touch with American manufacturers, with the result that, after a personal visit by two members of the firm, orders were placed in this country which they state will amount to about \$85,000.

Trade information bulletins issued by the specialties division during the year included Postwar Conditions in the German Toy Industry, Far Eastern Market for Sporting and Athletic Goods, Advertising in India, and Markets for Athletic Goods in Africa and the Near East. In addition to these major surveys, 73 circulars were issued on market conditions affecting specialty products and more than 250 reports were furnished for publication in trade journals and newspapers.

A survey covering exports of all classes of office appliances and supplies for the 12-year period 1913-1924, inclusive, was completed in the spring of 1925. Brief market surveys covering portable typewriters, soda fountains, and other special items have been completed and will probably be made available in the form of special circulars.

Surveys on furniture and jewelry are now in course of preparation by the division. Additional studies that are being planned cover professional and scientific instruments, business equipment, musical instruments, motion pictures, and other major groups coming within the sphere of activity of the specialties division.

The domestic sanitary-ware investigation will soon be completed; this covers plumbing supplies as well. The report will analyze the

urban and rural markets of States in this country, dealing with their relative consuming capacity as indicated by various general features.

The survey of foreign advertising media and methods (mentioned in last year's report) has been practically completed. The mass of data received from consular officers abroad has been carefully studied with the object of making it conveniently available to manufacturers, merchants, advertising agencies, and others interested in foreign publicity. The reports on particular newspapers, magazines, and trade journals abroad were tabulated on cards, and duplicate sets of these cards have been furnished to every district office of the bureau. Circulars have been issued on advertising conditions in Belgium, Australia, Great Britain, France, and the Union of South Africa, and others are to follow. Clients of the bureau who have taken advantage of this advertising-data service have considered it to be an outstanding achievement.

In April, 1925, a special section was established to deal with motion pictures. Close contacts have been established with the Motion Picture Producers and Distributors of America (Inc.). An advisory committee cooperates with the Department of Commerce in its work along this line. Similar contacts have been established with the Independent Motion Picture Association.

Other trade organizations with which the division maintains close contact include the National Association of Office Appliance Manufacturers, the Toy Manufacturers of the United States, the Music Industries Chamber of Commerce, the National Association of Button Manufacturers, and others.

TEXTILE DIVISION

The textile division of the bureau has cooperated with various branches of the Government, especially the War and Navy Departments and the Veterans' Bureau, in devising specifications for their textile purchases which will meet the requirements of the Government and at the same time, by bringing Government specifications more in line with commercial standards, permit freer competition from the trade. One phase of this work has to do with fast-color khaki. The textile division, the division of simplified practice, and the Bureau of Standards have all contributed a great deal toward the final adoption of standard sizes in the hosiery and underwear trades. Cooperating with other interests the division has worked to prevent unfair competition by prison-made textiles with products of legitimate manufacturers.

During the fiscal year 1925 about 315,000 copies of regular and 58,000 copies of special textile bulletins were mailed out, as compared with 260,000 and 150,000, respectively, during 1923-24. Regular bulletins dealing with raw cotton, cotton goods, wool and wool manufactures, bristles, and hair nets are issued weekly, while those on cotton grey-cloth prices, the yarn trade, and knit goods are published about once a month. Special statistics, compiled by the division of statistics and distributed by the textile division, on imports through specified customs districts, include those on cotton cloth by commercial classifications, certain classes of wool fabrics, and raw

wool—the first two being monthly and the last-named weekly. About 80,000 copies of these statistics were sent out during the fiscal year 1925. The textile division also issued two trade information bulletins—Marketing Cotton for Export and Cotton-Goods Market in the Netherlands East Indies.

Actual dollars-and-cents results attributable to the activities of the bureau in the textile field are numerous and important. The division sent advertising literature of an American hosiery firm to the bureau's representatives in various Latin American countries; the commercial attaché at Buenos Aires obtained an agent for the American firm, and the agent reported that in two months he sold \$60,000 worth of hosiery for the company. In cooperation with the bureau's representative in Warsaw, the textile division instituted negotiations for the funding of debts to the amount of about \$300,000 owing to American houses by Polish spinners. The Warsaw office and the textile division informed an American firm that the Polish Government desired to purchase parachutes, and at present there are prospects that this firm will secure an order for 600 parachutes. The division's representative in London rendered considerable assistance to this same firm in connection with the recent sale of 2,200 parachutes, worth approximately \$1,000,000, to the British Air Ministry. Another firm writes to the textile division stating that the amount of business which it did last year as the result of the bureau's services can be placed at "over \$150,000." From still another firm this statement comes:

We received approximately \$30,000 to \$35,000 worth of export business during the past year as a result of the services rendered by the Bureau of Foreign and Domestic Commerce.

TRANSPORTATION DIVISION

The issuance of the manual on Packing for Foreign Markets marked one of the important achievements of the transportation division during the past year. The investigation whose results are embodied in this book had been requested by the Committee on the Merchant Marine and Fisheries of the House of Representatives. The publication met with immediate success and more than 2,000 copies were sold the first month after its release. A special survey requested by the agricultural interests in the far Western States was completed during the year and the findings were made available in a monograph entitled "Transportation of Pacific Coast Perishables." The survey of railways of Latin America, requested by leading railway-equipment companies, was partly completed during the year, and the first volume, Railways of Central America and the West Indies, was published. The second volume, on Railways of Mexico, is in the hands of the printer; the manuscript of the third, on Argentine railways, has been turned over to the editorial division; and considerable work has been done on the fourth volume, which will cover the other South American countries.

Several new investigations of major importance were inaugurated during the year. A study of the economic aspects of the Great Lakes-St. Lawrence waterways project was started. In connection with the American Railway Association, an investigation of the wastes in

transportation in this country was begun. A survey of motor roads of Latin America was undertaken for the Pan American Highway Commission and for the American delegates to the Pan American Conference on Motor Roads to be held in Buenos Aires the latter part of 1925.

The chief of the transportation division spent three months at the beginning of the fiscal year in Europe studying transportation conditions. In the latter part of the fiscal year he made a similar survey in the West Indies and the northern part of South America. The chief of the communications section was appointed secretary of the American delegation to the first Pan American Conference on Electrical Communications, held in Mexico City the latter part of 1924. The division prepared a statement on the regulation of aerial navigation, which was presented by the department to the congressional committees considering this subject. Assistance was given to the Post Office Department in the revision of the rates on foreign mails and parcel post.

Publications compiled and issued by the division, in addition to those mentioned above, included The Merchandise Warehouse in Distribution, Shipping of the West and East Coasts of South America, the Uniform Through Export Bill of Lading, and Freight Forwarding in the United States and Abroad.

TECHNICAL DIVISIONS

DIVISION OF FOREIGN TARIFFS

The facilities of the division of foreign tariffs have been severely taxed by the work of ascertaining, interpreting, and communicating to American business men the developments in this field during the past fiscal year, in which nearly 40 countries have revised extensively their customs tariffs and related measures of trade control. Through the cooperation of this Government's representatives in foreign fields, the division has, in many cases, been the first to broadcast in the United States the full official story of a tariff change or a treaty negotiation in a foreign country of particular interest to American traders.

The number of inquiries that the tariff division handled by mail from Washington during the fiscal year 1925 totaled 8,845, an increase of more than 2,000 over two years ago and more than double the volume of such inquiries four years ago. Most of the replies call for considerable research and are usually accompanied by specially prepared statements or memoranda on particular situations. The above figures do not include the 1,200 problems presented personally by visitors to the division or the 1,300 inquiries handled by telephone.

Besides the regular announcements in Commerce Reports of news items of foreign tariff and treaty developments, which occupied 160 pages during the past year, general situations were made the subject of special circulars or articles in Commerce Reports. Their range is indicated by such titles as "Protective movement in British India," "Canadian tariff policy and American trade," "The Argentine merchandise-identification law," "The 26 per cent reparations levy."

Concise information regarding the duties and other conditions of admission of American automobiles into the principal foreign countries was prepared for dissemination as part of the loose-leaf Automotive Manual. In cooperation with the electrical division a start was made toward the preparation of comprehensive tariff studies on the admission of electrical goods into the principal foreign markets. For special occasions intensive studies were made of a great variety of problems connected with the tariffs and commercial policies of foreign countries, such as foreign tariffs on American wheat and flour, foreign license restrictions on certain manufactures, foreign protective measures for dye industries, foreign prohibitions on foodstuffs with particular ingredients, and foreign antidumping laws.

The division has been particularly active during the past year in the quiet advance dissemination of notices of impending tariff revisions and changes abroad, enabling exporters both to arrange their shipments in accordance with prospective changes and to initiate efforts to moderate particular tariff advances or new restrictions before the measures had been definitely passed or made effective.

Particularly numerous have been the instances where the Department of Commerce was called upon to aid in solving or mitigating customs difficulties in which American goods found themselves in foreign countries. This included such types of service as securing the lifting by a particular foreign country of the import restrictions upon American medicinal compounds, upon disproving certain allegations; assisting in securing import licenses for particular shipments into certain countries where such importations are possible only under individual permit; securing the release of an American shipment held in a foreign port for some documentary irregularity or similar customs infraction (and often effecting also the waiver of the customs fine involved); securing the admission of particular lines of goods under more favorable tariff classification and consequently a lower rate of duty. The total savings to American concerns from such services, while not easily calculable, would unquestionably reach very considerable amounts.

DIVISION OF COMMERCIAL LAWS

The division of commercial laws collects, compiles, and disseminates information regarding foreign commercial laws, regulations, and taxes (not tariffs) affecting American commerce; advises and assists in the amicable adjustment of trade disputes; disseminates information concerning preventable losses or injury to American exporters and merchants, and renders every possible practical assistance to American exporters and their counsel in connection with these and allied technical problems. In the fields of law, insurance, etc., the division has built up a staff of advisory experts, which is being constantly augmented; many persons of national reputation in their particular lines have gladly consented to serve the division in this capacity. Valuable aid has been given by the field officers of the bureau and by members of the Consular Service.

Inquiries and answers involving legal problems have increased about 25 per cent during the past fiscal year. These inquiries cover the entire range of commercial law and touch all the countries of the world. They have become increasingly technical and the problems presented more intricate.

During the year the circulars issued on foreign legal subjects numbered 65, dealing with such matters as Government contract requirements, taxation in Chile, Germany, Italy, Free City of Danzig, and Great Britain, and special company laws affecting business in Guatemala, Costa Rica, Mexico, Austria, and Latvia.

Eleven trade information bulletins were published. Typical among these are: Italian Tax Reforms, Taxation of Securities in Europe, Liability of Ocean Carriers for Cargo Damage or Loss, New Polish Negotiable Instruments Law. In addition a series of bulletins dealing with "Trading Under the Laws (of various foreign countries)" was instituted; eventually this series will be extended to cover all the commercially important countries of the world. Trading Under the Laws of Cuba and Trading Under the Laws of Brazil were the first of this series. The extensive demand for these bulletins bears testimony to their value.

A monthly circular is issued under the title of "Comparative law series," containing the text of various laws and other technical material too voluminous for publication in Commerce Reports. The demand for this is large and constantly increasing.

The special circulars of the division are distributed to a regular mailing list of approximately 1,500 individuals and firms. This number is considerably augmented by direct requests for specific bulletins and circulars.

During the year, by means of inquiries, research, and questionnaires addressed to field representatives and others, much valuable information covering the laws of the world on many subjects was obtained and made ready for immediate reference. Among these subjects are the laws of insurance, of bookkeeping, statements, and records, and of partial payments, installment contracts, etc.

The division has also revised and brought up to date its list of foreign attorneys. Names of reliable attorneys for practically every large city in the world are now on file in the division.

Practical advice has frequently been given as to the best method of attempting to collect overdue accounts abroad. Trade disputes arising from questions of quantity, quality, terms, etc., and other misunderstandings are constantly being adjusted through the intervention of the division. With the assistance of foreign representatives of the Government, in most cases, the division has successfully intervened in more than 400 trade disputes during the year, not only saving thousands of dollars for American exporters but in many cases preserving and increasing the good will of the foreign buyer toward American commerce. As a result of such adjustments the division has been instrumental in aiding settlement and facilitating the collection of accounts in the aggregate of many thousands of dollars.

The patent and trade-mark section is now a part of this division. That its field is constantly expanding is shown by the number and nature of the inquiries addressed to it. More than 1,200 answers to inquiries involving specific problems—many of them dealing with the laws of several countries—were sent out during the past year. This section's work in preventing the pirating of trade-marks and in dealing with unfair competition has been of great value to American commerce.

FINANCE AND INVESTMENT DIVISION

The extraordinarily large volume of foreign securities issued in this country during the past fiscal year has resulted in a marked increase in the number of requests from investment bankers and others for detailed information on the public finances of various foreign countries, provinces, and municipalities. The division of finance and investment has rendered, in this connection, direct practical service of great value.

The division has pushed the preparation of bulletins and monographs on the public finances of foreign countries. In the Latin American series there have been issued comprehensive studies of the finances of Chile and Bolivia, while a similar study covering Peru is in course of preparation. In the far eastern series a detailed study of the public debt, budget, banking, currency, and exchange of China was completed during the year, this report being of special timeliness in view of the previous lack of authentic data and by reason of the forthcoming international conferences on the Chinese financial situation.

Much of the basic information contained in these studies has been kept up to date through the publication, in Commerce Reports and in mimeographed circulars, of current data on budgets, public debt, etc.

The division began during the year the publication of three series of mimeographed circulars, issued at intervals of about two weeks, entitled "European Financial Notes," "Latin American Financial Notes," and "Far Eastern Financial Notes." It is gratifying to report that these circulars are read, clipped, and filed in the leading banks and banking houses. The general series of mimeographed circulars has been continued for the publication of longer reports on special subjects. The circulars on the banking situation in Norway and Denmark have been favorably commented upon for their timeliness and accuracy.

For the confidential use of the World War Debt Funding Commission, the division prepared exhaustive studies of the character, objects, etc., of the war-time and postwar advances of our Government to several of the leading European Governments. In this and in other ways the division has rendered special service to the Debt Commission.

Wide comment in the daily press and in financial and economic journals has been accorded to the division's studies of our increasing foreign loans and investments, our tourists' expenditures abroad, our immigrants' remittances, and other so-called invisible items in our international trade position.

The division has collected a great mass of material having to do with the mechanics of foreign exchange; this will be digested and assembled for publication in the near future.

DIVISION OF STATISTICAL RESEARCH

The most important work of this division was, as heretofore, the assembling and coordination of the Statistical Abstract of the United States and the Commerce Yearbook, involving the entire prepara-

tion of a large proportion of the latter publication. The second (1923) issue of the yearbook had a sale of about 9,000 copies—three times that of the first issue. The 1924 issue was completed much earlier than previous issues, advance copies being delivered on July 1, 1925, and a largely increased sale is anticipated. With the issue of the Statistical Abstract for 1924, the thoroughgoing revision that has been under way during the last three years was finally completed; the data have been arranged in briefer and, at the same time, more clear and convenient form.

Bulletins were prepared analyzing extensively the foreign trade of the United States by calendar years and by fiscal years, and summarizing the trade statistics of all the principal countries of the world. It has also, in consultation with the division of statistics, devised various condensations and revisions of the current monthly and annual statistical publications of the bureau showing the foreign trade of the United States in detail.

During the year a geographic section was established under the charge of a trained expert with a view to building up the map resources of the bureau, standardizing and improving the maps prepared by the bureau itself for publication or other use, and aiding in the geographic interpretation of domestic and international trade and industry. The division continued its direction of the graphical presentation of statistical material throughout the bureau. A translation section was organized with a view to increasing the service of the division to other divisions of the bureau and other Government offices in handling material from foreign languages.

The division continued to furnish to numerous correspondents data regarding the trade of foreign countries and many other subjects not falling strictly within the field of any commodity or regional division. Numerous compilations of the trade of foreign countries by commodities and geographical regions have been made for other divisions of this bureau, and aid has been given to all divisions in obtaining and tabulating other statistical data from both foreign and domestic sources.

DIVISION OF STATISTICS

The statistical division compiles statements of imports, exports, vessels entered and cleared, and other statistics of the trade of the United States with foreign countries and noncontiguous territories, from monthly and quarterly reports tabulated mechanically in the section of customs statistics at New York from import entries and export declarations forwarded from the various customhouses. The division prepares the statistical tables published in the Monthly Summary and the annual report on Foreign Commerce and Navigation, issues regulations and instructions regarding the statistical reports, prepares the classification of imports and exports for the guidance of collectors of customs, and handles correspondence and inquiries relating to United States foreign-trade statistics.

A new report was issued showing quantities and values of articles exported from each State in this country during the calendar year 1924. This report has been compiled in compliance with the long-expressed demand from manufacturing, business, and agricultural interests for information regarding exports originating in the differ-

ent States. It is not possible to trace exported commodities back to the State where they were originally produced, but the exports have been credited to the place of original shipment, as shown on the shipper's export declaration.

For the information of packing-house and stock-raising interests, a new report has been issued showing weekly exports of bacon, hams, shoulders, lard, and pickled pork. Weekly reports are now published covering exports of grains and flour; exports of pork products; imports of raw wool into Boston, Philadelphia, and New York; and imports of wheat from Canada.

About 250 special statements are issued each month showing exports and imports of principal selected commodities in complete detail by countries and customs districts; these are distributed in mimeographed form to a mailing list of more than 18,000 addresses. Inquiries answered by the division of statistics increased from 11,130 in the fiscal year 1924 to 12,105 in 1925, of which 7,693 were letters and the remainder personal and telephone calls.

In response to requests from domestic woolen-goods manufacturers, special monthly reports have been issued showing imports of wool cloths and dress goods at six principal ports, by kinds and trade designations. Special reports of imports of cotton cloths into five principal ports by specified trade designations are issued for the information of cotton manufacturers.

In order to keep within the allotted printing appropriations, the "principal countries" were omitted in the import and export statements published in the Monthly Summary for October and November, 1924. This omission caused many complaints, and publication of the "country" figures was resumed for December and succeeding months, after Congress had granted increased appropriations for printing.

COMMERCIAL INTELLIGENCE DIVISION

The primary purpose of the commercial intelligence division is to bring the foreign buyer and the domestic seller together for the sale of American products. Its most notable constructive work during the past fiscal year has been the development of the Directory of Foreign Buyers, the 57,700 new reports added during the year bringing the total number of reports on file up to 200,000. In view of the constantly changing conditions of the world's trade, much revision has been necessary to keep this directory up to date.

The reports mentioned (commonly known as World Trade Directory or sales information reports) are in demand because they give a complete picture of the business and importance of a foreign buyer, or, if an agent, his desirability to represent American firms. During the fiscal year just ended requests were received for 49,082 detailed reports on individual foreign firms, as compared with 28,451 requests during the preceding year.

In order to supply manufacturers and exporters with complete and up-to-date information relative to prospective foreign buyers for their commodities, 1,595 new and revised commodity lists of importers and dealers were compiled, mimeographed, and made available during the year; this represents an increase of 751 over 1923-24.

The requests for commodity trade lists reached the unprecedented total of 687,159. With the active cooperation of the Consular Service and the assistance rendered by commercial attachés and trade commissioners, this division has developed a comprehensive index of dealers and buyers of practically every commodity entering into international trade.

There has been an increased demand, on the part of exporters, for assistance in selecting foreign sales agents. In many cases the selection of prospective agents from material on file in the division has enabled exporters to make desirable and worth-while connections without going to the expense of sending a personal representative abroad.

The division has further developed and improved its confidential service of reporting to American banks having foreign departments the information received from the field relative to firms that fail, become bankrupt, go into liquidation, etc.

Another outstanding feature of the work was the publication of a trade information bulletin covering sources of foreign credit information. This contains the names of banks and mercantile agencies in the United States and foreign countries that are in a position to furnish data with respect to the standing of firms located abroad.

DOMESTIC COMMERCE DIVISION

The number of replies by the bureau's domestic commerce division to requests for specialized information showed an increase of 100 per cent during the past fiscal year, as compared with the year 1923-24.

A series of bulletins designed to improve retail trade practices was undertaken, six of which have been published and distributed, namely, Budgetary Control in Retail Store Management, Retail Store Location, Measuring a Retail Market, Retail Store Planning, Education of a Retail Sales Force, and Cooperative Retail Advertising. It is noteworthy that requests were received for more than 60,000 copies of the first of these bulletins and that the supply of another was exhausted within two weeks. Four more studies which will complete this series are either ready or in course of preparation.

Wholesalers' and manufacturers' trade practices have also come in for consideration. A bulletin setting forth the best methods of routing salesmen was prepared and published as Planning Salesmen's Territories. It will be followed by others in the field of sales management as funds become available.

On the basis of requests from various trades, and in collaboration with the appropriate commodity divisions of the bureau, several studies of domestic market possibilities have been issued. The first, Domestic Market Possibilities for Electrical Merchandising Lines, was an initial attempt to demonstrate the differing values of regional markets in the United States. Using several carefully chosen factors of sales volume and inclination, an analysis was made of the marketability of these commodities by States. A second in this series treats the Domestic Markets for Paints and Varnishes, and a third study on Domestic Markets for Sanitary Ware and Plumbing Supplies is nearing completion. A more general marketing study, The Merchandise Warehouse in Distribution, has been published, and

three others, Coal Products, Methods of Packing for Domestic Shipment, and Markets for Fertilizers, are almost ready.

A study of wholesale trade areas in the grocery trade is well under way. This is the first attempt to differentiate between political divisions and natural commercial trade areas, and it is therefore of a fundamental nature. There has been inaugurated an important investigation into the number and results of agencies engaged in commercial research; this will yield for the first time an inventory of projects completed and planned in this field. Considerable work has been done to revise and make current the bureau's directory of Commercial and Industrial Organizations.

The chief work of the division, however, has been the completion of two exhaustive surveys of domestic regional markets, both of which will appear in print at an early date. These studies of the Philadelphia and Atlanta marketing areas are the result of extensive field work and intensive statistical and general research in the office. Their aim is to present a complete and detailed picture of the resources, economic background and activities, channels of marketing, purchasing power and habits, and the effects of excess or deficiency in products of the region under consideration. They have been judged by trade interests to be of extraordinary value to domestic trade in evaluating markets and in adding to current knowledge of marketing. It is planned to conduct at least six similar surveys during the coming year and to keep the data current by the establishment of a regional reporting service.

The division's staff has constantly endeavored to maintain and add to the trade contacts that have been established. Representation on the National Distribution Conference and the National Conference on Street and Highway Safety is also keeping the division in close touch with the work of those bodies.

ADMINISTRATIVE DIVISIONS

EDITORIAL DIVISION

During the past fiscal year the editorial division was called upon to handle, in one way or another, nearly 45,000 reports from the foreign representatives of the Government. Commerce Reports, the weekly magazine issued by the bureau for the benefit of business men, was edited and published along much the same lines as in the previous year. The Foreign Trade Opportunities published numbered 4,909, as compared with 3,846 in the preceding year, an increase of 28 per cent.

A departure in connection with the work of the division was the placing of all trade information bulletins on a sales basis at a uniform price of 10 cents each. Formerly the publications of this particular class had been issued in the form of supplements to Commerce Reports and had been distributed free to selected lists of individuals and firms. These bulletins have become an increasingly important factor in the publication work of the bureau.

The Commerce Yearbook, 1924, presenting a concise and graphic picture of the world's industry and commerce, with special reference to the United States, was an outstanding publication edited during the year.

It proved necessary during the present calendar year to discontinue the publication of the supplements to Commerce Reports comprising the economic and trade reviews of foreign countries contained in the annual reports of consular officers. This action was due principally to the shortage of printing funds. The insufficiency of the printing appropriations for the bureau continues to be a problem of the utmost gravity and one that is hampering the work of the organization. Much more ample appropriations are needed to enable the bureau's publication work to function normally.

The total number of printed pages edited in the bureau during the fiscal year 1925 was 14,239, a slight increase over the 14,036 sent to the printer during the preceding year. The number of special circulars edited in the editorial division was about 2,900, the total number of pages in these circulars being approximately 7,500.

DIVISION OF CORRESPONDENCE AND DISTRIBUTION

This division comprises two distinct sections, correspondence and distribution.

In the correspondence section the incoming correspondence is routed to the approximately 50 separate units in the bureau and outgoing correspondence is reviewed from the standpoint of statements of fact, adherence to bureau and departmental policy, compliance with administrative rules and regulations, typographical appearance and form, in addition to the broader factors necessarily entering into a varied correspondence of the volume carried on by this bureau. This division also carries on a large correspondence of its own in relation to a variety of subjects, having answered about 15,000 inquiries by mail during the fiscal year.

Records kept in this division show the number of commercial services rendered by the bureau in Washington and its district and cooperative offices. These services totaled 2,091,250 in the fiscal year 1925, as compared with 1,236,326 in 1924, 972,702 in 1923, and 589,533 in 1922. The 1925 total shows an increase of 69 per cent over 1924.

Requests received during the year for information reserved from Foreign Trade Opportunity announcements totaled 446,865, as compared with 345,784 in 1924, 332,131 in 1923, and 127,385 in 1922.

Continued interest in trade lists issued by the bureau is evidenced by the total number of requests received for such material, 687,159 trade lists having been asked for in the fiscal year 1925, as compared with 417,195 in 1924, 181,049 in 1923, and 71,900 in 1922. The total number of trade lists distributed in 1925 was about 1,103,900, representing 1,577 separate lists.

The number of copies of confidential and special circulars sent out during the year totaled 3,713,800, comprising 3,668 separate statements, as compared with approximately 3,100,000 comprising 2,227 statements in 1924, 1,000,000 involving 1,100 separate statements in 1923, and 350,000 covering 744 statements in 1922. The number of envelopes addressed or individuals served increased 280 per cent in 1924-25, as compared with the preceding year.

The correspondence division maintains a group of reserve stenographers and typists who are available upon request for work in other units of the bureau. This service has developed into a training school from which vacancies occurring elsewhere are filled; approximately 25 such transfers were effected during the fiscal year.

As in the past, the distribution section has maintained mailing lists for the distribution of publications and circulars and has supervised the mechanical and physical details connected with the Exporters' Index.

DISTRICT AND COOPERATIVE OFFICES

The bureau established, during the fiscal year just past, two new district offices, one at Detroit, Mich., and the other at Portland, Oreg., and four cooperative offices, at Jacksonville, Fla., Orange, Tex., Houston, Tex., and Des Moines, Iowa.

The number of services rendered by the district offices increased from 967,620 during the fiscal year 1924 to 1,826,381 in 1925. There were 440,670 Trade Opportunities distributed by the district offices during 1925, as compared with 343,511 during 1924 and 687,159 trade lists distributed as compared with 416,000 during the preceding year.

The increase in the number of services rendered by the New York district office has been most remarkable. This office alone performed 1,191,562 services for business men during the fiscal year 1925, an increase of more than 100 per cent over the 572,997 that were recorded during the preceding fiscal year. The letters received from firms in the New York district showed an increase of over 25 per cent. The total number of persons visiting all the district offices for commercial assistance during the past fiscal year was 61,996.

The Detroit district office was opened July 1, 1924, and the need for it has been conclusively demonstrated by the extent to which its services have been utilized by the business interests of Michigan. The inquiries have increased from 40 during the first week in July to approximately 700 for the last week in June. The Portland office was opened on May 15, 1925, and is meeting with enthusiastic support and encouragement. The Portland Chamber of Commerce has provided space for the bureau's office until such time as permanent quarters are available and has cooperated very closely with the district manager ever since his arrival there.

FOREIGN SERVICE DIVISION

Nine hundred and twenty-one pouches of mail were received in the foreign service division during the fiscal year and routed to the various divisions of the bureau. In addition to the pouches, which arrive every few days, half a dozen or more packages of open mail arrive every day from those offices that do not have the pouch service. Copies of all communications between the bureau and its field offices, including weekly reports and economic and trade notes, were retained in this division for the information of other departments of the Government.

The practice was continued of arranging itineraries for field representatives whom it was considered desirable to have visit the

various district and cooperative offices of the bureau for the purpose of conferring with local business men. The budgets of the field offices were carefully supervised and amended from time to time to meet unforeseen exigencies of the commercial-attaché and trade-commissioner service. Three hundred and seventy-four letters of introduction to the field offices were issued during the year to business men who were going abroad.

During the past fiscal year 10 new offices were established abroad and 11 commercial attachés, 5 assistant commercial attachés, 15 trade commissioners, 27 assistant trade commissioners, and 4 American clerks were appointed to foreign posts. Separations from the foreign service due to resignations and transfer to Washington included 3 commercial attachés, 10 trade commissioners, 5 assistant trade commissioners, 3 special agents, and 6 American clerks.

Communications of all kinds between the bureau and our foreign offices, and vice versa, passed through the reviewing section, in which a record was kept of all the reports and letters from each of the foreign offices to the bureau and the amount of work each foreign office and each foreign representative was doing. During the year 768 special reports, 6,259 economic and trade notes, 23,182 informational letters, and 13,085 letters to be forwarded to outside firms were sent to the bureau by its 41 foreign offices and passed through the reviewing section, a grand total of 43,294 as compared with 29,920 last year. The various divisions sent to the reviewing section to be forwarded to the foreign offices 51,065 letters and communications of all kinds. There were also 1,400 questionnaires sent out to the foreign offices, originating in the various divisions of the bureau.

Of reports and letters received by the bureau from its foreign offices, the following is the average per office for the fiscal year 1924-25: Special reports, 19; economic and trade notes, 153; letters to bureau, 565; letters to outside parties, 319; answers to questionnaires, 34; trade opportunities, 21.

A total of 6,497 cablegrams were transmitted between the field offices and the bureau during the fiscal year ended June 30, 1925, as compared with 5,754 for the previous year, 4,200 for 1923, and 3,127 for 1922.

The practice of sending "charge" cablegrams on behalf of private firms and individuals has proven to be a quick and reliable means of obtaining up-to-date information. This service is constantly being made use of by American business.

COOPERATION WITH OTHER DEPARTMENTS

The fiscal year 1924-25 has witnessed decided progress in the working out of harmonious relations between this bureau and the Department of State, chiefly as a result of the Executive order of April 5, 1924, and the work done in inaugurating a system in the liaison office whereby an accurate record is kept of all consular reports received and first-hand comments are secured from the regional, commodity, and technical divisions designated to take action on them. Detailed comments have been furnished to consular officers on the quality and disposition of each one of their reports during the past year, with most gratifying results.

The percentage of consular reports on which no action was taken has fallen from 27 in 1923-24 to 5.7 in 1924-25; this is indicative of a much better understanding, on the part of consular officers, of just what kind of material is useful to this bureau. The percentage of consular reports given special distribution shows an increase from 11 to 14.6.

The Department of State has taken occasion to express its appreciation of the records kept by the bureau's liaison office with regard to the action taken on consular reports and states that these records are of great assistance in grading the work of the consular offices. The Department of State has likewise expressed its gratification at the work of our liaison office in supplying consular officers with clippings from the press and from trade journals and with special circulars giving the texts of their reports as they are made available for American business men.

The system of sending consular officers questionnaires carefully reviewed by the bureau's questionnaire committee continues to function with highly satisfactory results. During the year 948 questionnaires were sent to consular officers.

The practice of sending to the liaison officers of all departments of the Government a weekly list of reports from the bureau's representatives has been maintained, and reports which they request are made available to them. It is believed that this practice has greatly increased the usefulness of this bureau to other departments of the Government.

There has been a noticeable increase of late in the number of consuls visiting this bureau. Arrangements have been made with the liaison officer of the State Department for the class of consular officers now receiving instructions at the State Department to make a personally conducted visit to the bureau in groups of four or five for the purpose of forming a clear picture of the manner in which consular reports are handled by this bureau and gathering information regarding the activities of the commodity, technical, and regional divisions.

STANDARDIZATION WORK

Pursuing its joint aid with the Bureau of Standards in the preparation of a preliminary program for the First Pan American Conference on Uniformity of Specifications and in the formulation and effectuation of plans for this work, the bureau sent a delegate to this conference, which was held in Lima, Peru, December 23, 1924, to January 6, 1925. Following the conference a section was organized to provide for continuity of the work.

In accordance with detailed plans formulated and approved by an advisory board composed of representatives of 14 national organizations, the Bureau of Foreign and Domestic Commerce cooperated with the Bureau of Standards in the publication of a Dictionary of Specifications.

RECOMMENDATIONS

The following are, in my opinion, the essential needs of the Bureau of Foreign and Domestic Commerce:

1. Adequate legislation to place the foreign service of the department on a permanent basis.

2. Additional district offices in some of the more important industrial centers of the United States, so that the bureau's highly perishable commodity (commercial intelligence) may be distributed more rapidly to those firms which make use of it in building up their export trade.

3. Increased appropriation for the work of the domestic commerce division, in order to make additional surveys of domestic regional markets, which are being demanded by business organizations and individuals.

4. Legislation authorizing the bureau to send experts and exhibits to trade conventions and to charge fees for the enrollment on the Exporters' Index, as well as legislation authorizing the department to permit the foreign offices to subscribe, in advance, to newspapers and periodicals, so essential to the work of the bureau.

5. Additional offices in foreign countries, especially in those countries where inadequate communication facilities make the establishment of branch offices a necessity.

6. Larger appropriations to permit the assignment to commodity divisions of experts in particular commodities forming a considerable share of our yearly foreign trade.

7. More ample printing appropriations.

Very truly yours,

JULIUS KLEIN, *Director.*

BUREAU OF STANDARDS

DEPARTMENT OF COMMERCE,

BUREAU OF STANDARDS,

Washington, July 1, 1925.

HON. HERBERT HOOVER,

Secretary of Commerce.

DEAR MR. SECRETARY: In response to your request I furnish the following condensed report upon the work of the bureau during the past year:

GENERAL ACTIVITIES

The development of the work of the Bureau of Standards should, in my opinion, keep pace with the growth and increasing variety and scope of the Nation's activities. "The world to-day is ruled by physical science, and business, which, in the vast proportions industry and commerce have now attained, is itself the child of physical science." (Bryce's South America.)

The bureau's work in science and technology is all for the public welfare. It is a great service bureau which increases the wealth and productive capacity of the Nation, reduces fire losses, as well as hazards, in trade and transportation, maintains and raises standards in industry, improves conditions affecting safety, service, and stability and fair dealings in trade, furnishes a homogeneous staff and already equipped laboratories for use in times of stress, serves as a testing and research laboratory for other Government departments, cooperates with them and with industrial and trade organizations in formulating commodity and engineering specifications, and prevents litigation costs by acting as a court of appeal on many technical questions.

Among the activities that could be extended with great advantage and savings to the country are the simplification and housing problems; more adequate facilities for testing instruments of precision for manufacturers and users; determination of fundamental physical and chemical constants of importance in many lines of industry and engineering; experimental research as related to standards of measurements, quality of materials, testing methods, and performance of machines; and the experimental data needed in relation to uniformity of practice, especially for public utilities and the regulation of automotive traffic.

The factor of foreign competition should not be lost sight of in considering the rôle of the bureau in the program of national economy. Nineteen nations now have standardizing bodies and their impress on commerce is beginning to be felt. Certain other governments, such as England, while curtailing all other expenses, are increasing by large amounts their appropriations for scientific

and technical research and extending their plants and building new laboratories.

The visiting committee states:

The world is presumably now entering upon a period of intense aggressive international competition in all matters relating to the arts and industries. If, with our relatively high standards of living and consequently high wage scales, we are to hold our own in this competition we can not afford to handicap ourselves with any lack of facilities for the study of problems of basic scientific and industrial importance, facilities with which many of our competitors are now provided in degree far better than are we.

The place of such a laboratory can not be taken by any private institution or organization. No private interest could be expected to maintain indefinitely a national viewpoint or to preserve at all times a properly balanced regard for the interests of all the people.

Again, the United States Government is in itself the largest business enterprise in the world, and its executive officers should have at their disposal, and in the fullest degree, expert advice and aid on all matters of a scientific and technical nature which concern its welfare.

NATIONAL SCREW THREAD COMMISSION

This commission, organized by act of Congress in 1918 and composed of representatives from the Departments of War, Navy, and Commerce; the Society of Automotive Engineers; and the American Society of Mechanical Engineers, with the director of the bureau as ex officio chairman, has issued the past year a second report, bringing the matters in the first report of 1921 up to date and including new material relating to threading tools, tool shapes, tap dimensions, tap drill sizes, screw threads of special sizes, fire-hose couplings, and wood screws.

The life of the commission expires by law in 1927, and in view of the success of the commission and the many things in its field still needing attention, it is strongly recommended that the life of the commission be extended indefinitely. This is particularly desirable also for the reason that its findings are mandatory on the Government departments and from the preeminent position the commission has secured in industry.

FEDERAL SPECIFICATIONS BOARD

The Federal Specifications Board is one of several coordinating boards of the Federal Government which function under the Chief Coordinator, who in turn is responsible to the Director of the Bureau of the Budget. The chairman ex officio of this board is the Director of the Bureau of Standards and the vice chairman and technical secretary is a member of the bureau's staff.

The board is composed of one representative from each executive department and independent establishment which purchases supplies under specifications.

The board now has 72 technical committees working on groups of related items and specifications, these technical committees being composed of experts officially designated by the representatives of the various departments of the Government. The Bureau of Standards takes a very active part in the work of almost all of these technical committees and the chairmanships of 26 of these committees are held by Bureau of Standards experts.

In connection with the development and formulation of United States Government master specifications a great deal of research work has been done by the bureau. The board has officially promulgated 316 master specifications as Government standards.

The preparation and use of master commodity specifications for the entire Federal Government is an essential step in the economy which results in the purchase of materials in large quantities. In no field of Government operation was there greater need for constructive work than in the field of purchase standards. In the case of certain materials and supplies there were slight variations in specifications of the different departments and establishments, the special and peculiar requirements of which meant departure from standard commercial practice, which in turn necessitated special fabrication, which always involves greater cost.

It is intended that eventually all Government purchases will be based on correct standards of quality and practice. Our specifications will then meet the needs of the Government as to uniformity and will avoid duplication of effort on the part of the Government and industry.

NATIONAL DIRECTORY OF COMMODITY SPECIFICATIONS

During the last year the work on the preparation of the National Directory of Commodity Specifications was completed and this publication will soon be ready for distribution. The issuance of such information has been possible only through the active cooperation of the Government departments, the State and municipal governments and independent establishments, public utilities, the technical societies and trade associations, and the leading industrial organizations.

The directory contains a classified list of approximately 27,000 existing specifications, covering over 6,000 commodities, and this publication will be found very useful in connection with purchases.

TREATISE ON SPECIFICATIONS

Work is now under way on a treatise on specifications which will deal with the selection, use, and limitations of commodity specifications and testing methods. An analysis of material available shows that a well-rounded treatise can be prepared. Such material as we now have on hand has been obtained from the American Engineering Standards Committee, the American Institute of Architects, the American Society for Testing Materials, and the National Association of Purchasing Agents.

HOUSEHOLD SPECIFICATIONS

Work has been started on a publication to aid the housewife in the selection and purchase of commodities for the home. An analysis of the material on hand shows that with certain very important exceptions most of the specifications for household commodities have been prepared by and for the use of "experts." However, it is believed that this material can be worked up in such manner that the housewife can make use of it when making her purchases.

VISITING COMMITTEE

This committee, established by law "to visit the bureau at least once a year and report to the Secretary upon the efficiency of its scientific work and the condition of its equipment," is composed of Messrs. S. W. Stratton, W. D. Bancroft, A. Swasey, W. F. Durand, and Gano Dunn. The committee met twice at the bureau, once with the Director of the Bureau of the Budget, and on December 22, 1924, issued a comprehensive printed report on the activities of the bureau (Misc. Pubs. of B. of S. No. 63), emphasizing the need of the country for extension of the bureau's activities in scientific and industrial research and the urgency of further increasing its facilities to meet the ever-increasing demands for testing services both for the Government and the public; and calling attention to the evident advantages to the Government that would accrue if the specification work of the bureau could be expanded.

ADVISORY COMMITTEES

Much of the bureau's scientific and technical work of interest to American industry is mapped out by the aid of advisory committees representing industry. There are some 80 of these committees composed of leaders in their respective fields, which meet, as occasion requires, at the bureau for consultation with our staff. In this way the bureau is kept in close contact with the needs of industry, and many of these committees have been very helpful in aiding us to orient our work so as to make it most effective.

Likewise, many members of the bureau's staff are officers of the national scientific and technical societies. For instance, the chief of the electrical division is president of the Illuminating Engineering Society and the chief of the radio section is president of the Institute of Radio Engineers.

RESEARCH ASSOCIATES

The number of research associates stationed at the bureau by trade, technical, and scientific associations at work on fundamental problems of interest to industry has increased the past year from 29 to 63, representing 48 industrial or scientific groups and an expenditure at the bureau by them of over \$250,000. These cooperative arrangements are working out very satisfactorily, and the findings of investigations so carried on are in all cases made available to the public through publication of the results.

SIMPLIFIED PRACTICE

The close of this fiscal year marks an important change in the history of a number of important American industries, and the movement for elimination of seldom-used varieties of commodities has grown considerably in scope, with the result that large savings have accrued to manufacturers, distributors, and users in these various fields.

Up to the present time the following simplified practice recommendations have been accepted by the representatives of the industries concerned and have been printed: 1, Paving brick; 2, bedsteads, springs, and mattresses; 3, metal lath; 4, asphalt; 5, hotel chinaware; 6, files and rasps; 7, face and common brick (clay); 8, range boilers and expansion tanks; 9, woven-wire fencing; 10, milk bottles and caps; 11, bed blankets; 12, hollow building tile; 13, structural slate; 14, roofing slate; 15, blackboard slate; 16, lumber; 17, forged tools; 18, builders' hardware; 19, asbestos paper and millboard; 20, steel barrels and drums; 21, brass lavatory and sink traps; 22, paper; 23, plow bolts; 24, hospital beds; 25, steel reinforcing bars; 26, hot-water storage tanks; 27, cotton duck; 28, sheet steel; 29, eaves trough and conductor pipe; 30, terneplate; 31, loaded shells; 32, concrete building units; 33, cafeteria and lunch-room chinaware; 34, steel lockers; and 35, milling cutters.

The following recommendations are now in process of acceptance: Warehouse forms, commercial purchase forms, sand-lime brick, dining-car chinaware, hospital chinaware, boxed elastic webbing, paper bags, and paint and varnish brushes.

Surveys of existing varieties are in process for the following industries: Brake linings, license plates and brackets, piston rings, spark plugs, taper roller bearings, tires, poppet valves, seeds, shovels, drop-forged wrenches, tacks and nails, sheet-metal ware, bathroom fixtures, sterling silverware, fruit and vegetable cans, bright-wire goods, pocket knives, machine knives, mops, yarn, boxboard for set-up and folding boxes, bolt and nut containers, commercial baskets, fruit and vegetable crates, millwork, hardwood lumber, binder board, office desks and tables, power boilers, wood utilization, wood handles, plywood, poles, drills and reamers, electric lamps, elevated steel tanks, glass sidewalks and skylights, grinding wheels, lock washer and nut locks, taps and dies, tissue paper, bank checks, aluminum ware, and clay products.

The American marine standards committee, which is being operated as a unit of the division of simplified practice, has made substantial progress during the year in establishing an active program for this organization. A number of standards have already been adopted, and these will soon be in shape for printing. Many more are under consideration with promising prospects of fruition during the coming year. Moral support of the organization is indicated by enrollment of 265 varied interests in the marine and allied fields in its membership.

During the year, 23 simplified-practice recommendations were developed and accepted; 150 new fields requested the cooperation of the division in connection with a simplification program; 50 projects (commodities) have developed to the point where there is reasonable expectation of their completion into simplified-practice recommendations; 23 articles were prepared on the subject of simplification by the members of the staff for printing in outside publications.

Leaders in nine of the important industries cooperating with the division have estimated their annual savings through the adoption of simplification to be as follows:

Field	Varieties reduced		Estimated annual savings
	From—	To—	
Paving brick.....	66	4	\$1,000,000
Sheet steel.....	1,819	263	2,400,000
Reinforcing bars.....	40	11	4,500,000
Warehouse forms.....	3,500	18	5,000,000
Range boilers.....	180	13	5,500,000
Builders' hardware:			
7,000 catalogue items.....	(0)	(0)	10,000,000
Recognized finishes.....	(0)	(0)	15,000,000
Inquiry, invoice, and purchase order forms.....	4,500	3	250,000,000
Lumber (yard sizes)..... per cent..	100	40	200,000
Flow bolts.....	1,500	840	
Total savings.....			203,600,000

¹ Reduced 26 per cent.

² Reduced 71 per cent.

It is very difficult for any industry to estimate the net annual saving through the application of simplified-practice recommendations. However, the bureau confidently believes an additional 50 per cent above the amount shown would be more than conservative in estimating the net annual savings in the other industries represented by the 34 other simplified-practice recommendations already in effect.

BUILDING AND HOUSING

The work of the division of building and housing on building codes, city zoning, statistics, and service for home owners was continued from the previous year with splendid cooperation from industry, civic organizations, and local and State government officials. These groups and others interested in construction, housing, and civic improvement have helped to make the results of the division's work of maximum benefit throughout the entire country.

The building-code committee, which consists of nationally known professional experts, published its reports, Recommended Minimum Requirements for Masonry Wall Construction and Minimum Live Loads Allowable for Use in Design of Buildings. These reports were completed after consultation with architects, engineers, fire chiefs, building inspectors, contractors, building-material manufacturers, and with numerous organizations representing these groups. Incorporation of these recommendations by municipalities in their building codes will, it is believed, promote more economical construction, at the same time insuring ample safety. They embody the results of research and canvassing of opinion, which makes them of direct value in the design of a large proportion of the buildings erected in the United States each year.

The use in at least 15 States of the department's standard State zoning enabling act drafted by its advisory committee on city planning and zoning has been most effective in guiding the zoning movement along a sound legal channel and has obviated the need for the duplication of legal research by legislative bodies. The advisory committee prepared a pamphlet comparing the use, height, and area

regulations of the zoning ordinances in 16 selected cities and a booklet on the usefulness of city planning in facilitating traffic, encouraging more careful utilization of expenditures for street and public works construction, and developing home sites at low cost. Drafting of a standard State act permitting municipalities to create city plan commissions was commenced.

Drafting of a standard State mechanics' lien act which would be considered fair by all interests and be suitable for adoption by the States was undertaken at the urgent request of several representative national organizations. A voluntary committee of nationally known men, representing contractors, labor, material men, financing agencies, real estate, architects, engineers, and the National Conference of Commissioners on Uniform State Laws, is actively at work.

The division gave substantial aid to Better Homes in America in the preparation of pamphlets, in obtaining cooperation from various agencies, and in other ways. This organization works closely with other Government departments and numerous national bodies. It assists several hundred voluntary local committees who conduct better-homes demonstrations that aim to present well-balanced homes, in which the value of the house, the lot, and the furnishings and equipment are well proportioned, and from which families can obtain suggestions for improving their homes and lessening housework with the least possible expense. The work centers about the problems of families in the lower and medium income groups.

Preliminary studies of conditions relating to home financing, including some field work, were made. They showed that it is common for home seekers to face most disadvantageous financing conditions, especially in borrowing more than 40 to 60 per cent of the value of the home. Discounts, fees, bonuses, commissions, or other charges often add several hundred dollars to the cost of a moderately priced house, and are apparently entirely out of line with the risks involved to lenders in this class of loans as a whole. The situation differs in communities according to the existing financial structure, State laws relating to mortgages, conveyances, and titles, and to financial institutions, local industries, and other variable factors. A number of communities have worked out fairly satisfactory solutions, and it is believed that if the facts could be made available upon which to base sound endeavors, substantial efforts would be made to improve conditions by individuals, building-material manufacturers, and others especially interested in maintaining a high volume of residential construction.

Statistical work of the division included obtaining monthly prices for 24 building-material items as paid by contractors in about 50 cities. These prices were issued regularly and republished by a number of trade papers. The figures so obtained are used in compiling index numbers of the price of materials for small frame and brick houses. Current statistics on building activity, building costs, and production, consumption, and stocks on hand of the principal building materials were printed monthly in the Survey of Current Business and in Commerce Reports. Inquiries for such statistics have come to the division from all branches of the building and material industries, appraisal companies, railways, Federal, State, and local government agencies, libraries, and educational institutions.

Work on seasonal operation in the construction industries included publication of a 216-page volume, a pamphlet on weather and construction, and shorter articles. Leading national organizations of building-material producers, contractors, and other interests were represented on the committee of the President's Conference on Unemployment that worked with this division on the subject. These bodies, as well as local groups in many cities, have cooperated in efforts to distribute building activities more evenly throughout the year, to the end that hundreds of thousands of men in the building trades and material-producing industries may have steadier employment, and that traffic demands on railroads and general business conditions may be better stabilized.

WEIGHTS AND MEASURES

Several years ago an investigation of dental amalgams was carried out by the bureau, and the results obtained have proven of such value to the dental profession and to the public that work in the field of dental materials is being continued by an investigation of inlays of precious metal alloys. The purpose of the investigation is to improve the quality and permanence of dental restorations by a wiser choice of materials and by the selection of the most appropriate mechanical manipulation and heat treatment possible for the materials chosen. Two papers describing the results so far obtained appeared in the *Journal of the American Dental Association* for May, 1925.

A new instrument based upon the principle of the interference of light waves was designed and constructed for use in testing hæmacytometers (blood corpuscle counting chambers). The instrument has been given a thorough test, and the results show that the accuracy obtained by its use is from five to ten times that heretofore obtained by the use of a micrometer apparatus. Furthermore, the time required to complete the same amount of work with the new instrument is from one-fourth to one-fifth that previously required.

During the past year a large number of invar tapes, such as are used by the United States Coast and Geodetic Survey, were standardized at the bureau, and about 25 were also graduated. The graduations were placed on the tapes with such precision that the actual error in the total length of the tapes was in many cases less than 1 part in 1,000,000. In the standardization of these tapes the length values obtained were accurate to 1 part in from 5,000,000 to 10,000,000. The repeated standardization of several tapes of different ages showed that tapes made from 10 to 15 years ago are practically constant in length, while in the case of invar manufactured within the past few years lack of dimensional stability is a source of some uncertainty.

The work of testing railroad track scales and master scales was actively continued during the year; 18 master scales were tested and adjusted, and 898 commercial track scales were tested, corrective adjustments also being made on 79 of these scales. Thirty-five railroad test cars were calibrated. The number of tests exceeds that heretofore made in any year except last year.

Demands for the services of field equipment are becoming more urgent. Last year it was pointed out that concentration upon test-

ing work necessarily required the neglect of other essential duties. While somewhat more progress in these lines was made this year than last, conditions in this respect are still very unsatisfactory.

A statistical analysis of the results of the field-testing work during the past year shows continued improvement in revenue freight-weighting conditions. For instance, 65.2 per cent of all scales tested passed the tolerance of 0.20 per cent. This is the best figure obtained since the inauguration of this work in 1914, and is to be compared with 56.9 per cent last year, the best figure heretofore recorded. Another figure that shows conclusively the result of sustained effort to improve freight-weighting conditions is the mean numerical error of all railroad-owned scales tested in the western district, namely, 0.19 per cent, which figure is inside the tolerance and is the mean of 323 tests. The bureau feels this to be a real achievement. Moreover, the mean numerical error of all scales tested throughout the country was only 0.27 per cent, a figure not very greatly outside the tolerance, and very materially better than any figure heretofore obtained, as is demonstrated by citing the similar figures in 1924, 1923, and 1922, namely, 0.36, 0.38, and more than 0.63 per cent, respectively.

Included among the scales mentioned above were 82 track scales used for weighing grain. Of these 35, or 42.7 per cent, passed the special grain scale tolerance, namely, 0.10 per cent of the applied load. Corrective adjustments were made on 20 of the 47 scales that failed to comply with this tolerance. Adjustment service on this class of scales is provided in all cases where the condition of the scale warrants it. It is to be regretted that the bureau's facilities do not permit giving an amount of attention to the matter of weighing grain commensurate with its importance.

Circular 199, Specifications for Hand-Operated Grain Hopper Scales, was published during the year.

The bureau has assisted the American Petroleum Institute and the National Screw Thread Commission in the establishment of a standard for oil-well casing threads by measuring and certifying master plug and ring gauges for the standard sizes of casing adopted by the institute. These gauges will be assembled in sets, one for each of the four principal oil regions, and a master set will be deposited at the bureau to serve for checking the regional masters from time to time. Eventually, we hope, uniformity and complete interchangeability of casing threads will prevail throughout the entire country. This standardization will increase the safety of threaded joints in well casing, and will greatly reduce the loss from failure of joints. Since the value of the casing in a single well may be from \$50,000 to \$75,000, it is evident that any step which reduces the loss of casing will be of great economic importance.

Of the 10,000 pieces of graduated glassware submitted for test during the year, 87 per cent passed the test and received the bureau's precision stamp. This is the highest percentage that has been approved in any year since the beginning of this work.

In the last annual report mention was made of the National Standard Petroleum Oil Tables, which had just been published by the bureau. These tables have come into very general use in the petroleum-oil industry. During the past year need developed for a short, convenient correction table for reducing oil volumes to the standard tem-

perature of 60° F. An abridged table has accordingly been prepared, which has been approved by the American Petroleum Institute, the American Society for Testing Materials, the Bureau of Mines, and the Bureau of Standards. This table is not intended to replace the more complete table contained in Circular 154, which is regarded as official, but rather to supplement it, and especially to replace the various abridged tables and approximate correction factors heretofore employed in the oil industry.

The eighteenth meeting of the National Conference on Weights and Measures, a body composed of officials from all parts of the country and devoted to the procurement of uniformity in weights and measures regulation, was held in May and was very successful. A code of specifications and tolerances for vehicle tanks was adopted, this superseding a tentative code adopted two years ago. Specifications and tolerances for taximeters were tentatively adopted, and a complete method of test for these instruments was developed. Tolerances for loaves of bread were also adopted. These are designed for use in the enforcement of existing standard-weight bread laws, and for incorporation in bills hereafter introduced involving this principle, which is making great headway throughout the country. The proper method of the sale of ice cream, a subject which has caused all those interested much concern in recent years, was given careful attention, and full opportunity was afforded to the manufacturer, the retailer, and the official to explain the matter in detail from their different viewpoints. A special committee will study the whole subject during the next year and report back a plan for consideration at the next meeting. The subject of the proper apparatus and methods for the test of heavy-capacity scales was considered among many other timely subjects of importance.

The field work in connection with the research on orifice meters for the measurement of natural gas in large quantities, as well as the computations necessary to reduce the observed data to a comparable basis, have been completed, and the data show that a very wide range of conditions has been covered. The analysis of the results necessary to the formulation of conclusions from the research is now well under way.

A very simple scheme, involving on the average less than two weighings per weight and not requiring the use of substitution or transposition methods of weighing, has been completed and will shortly be published. It is felt that this simplification will have the effect of stimulating many persons to calibrate their weights who formerly have not done so, which will be followed by an increase in the general accuracy of laboratory weights and weighing.

In addition to the test of watches, clocks, and chronometers, the bureau cooperates with the Horological Institute of America in the examination of applicants for certification as junior watchmakers, certified watchmakers, and certified horologists. These examinations consist of a written test and a practical demonstration of ability to repair a damaged watch. After repair by the candidate the watch is examined by a committee of expert watchmakers and is tested by the bureau for performance as to time-keeping qualities.

Service tests on a wide variety of stop-watches were carried out to determine both their accuracy and durability. The results showed

a wide range of performance. Some of the watches failed after a small number of operation cycles, consisting of starting, stopping, and return to zero, while others continued to operate satisfactorily through several thousand cycles. The best performance was 14,700 cycles before failure.

ELECTRICITY

Electrical measurements are theoretically based upon mechanical forces and dimensions, but on account of the difficulty of fixing the units accurately the practical basis is an international agreement on electrical standards. It is now known that the international electrical units are not exactly in agreement with the mechanical ones. The bureau has in progress several projects which are intended to give better values for the electrical units and at the same time to simplify the process of checking up these values on a strictly correct basis. Fair progress has been made during the year on the apparatus for determining the value of the ohm and the henry in absolute units, and experimental work on standard cells, by which the accepted value of the volt is maintained, has been revived after a lapse of several years.

The extension of accurate measurements to keep pace with development in power transmission has taxed the resources of the bureau. By refining the methods previously used, the calibration of voltage transformers is being carried up to 100,000 volts. An absolute electrometer which will measure up to 350,000 volts is now ready for assembly. Accurate tests of resistance standards used for measurement of current have been extended to 10,000 amperes on direct current, and tubular oil-cooled standards for tests of current transformers at 5,000 amperes have been designed.

Special attention has been given to the possible development of rubber compounds suitable for submarine cable insulation, and some have been found which are better than gutta-percha in electrical properties. To simulate deep-sea conditions apparatus has been installed for making electrical measurements on wires under hydrostatic pressures up to 10,000 pounds per square inch.

Dry cells, storage batteries, and caustic soda primary batteries used for railway signaling have all received much attention during the year. The performance of all the important types of railway batteries has been determined, both at ordinary temperatures and at the freezing point, as a basis for specifications in preparation jointly by the American Railway Association, the battery manufacturers, and the bureau. Effects of impurities in storage-battery electrolytes and the properties of several "patent" electrolytes have been thoroughly studied. The results have been used both as a basis for specifications for acid and in published warnings widely circulated to protect the public from fraud. Dry cells representing the product of 23 manufacturers have been tested for the information of the manufacturers and of Government purchasing officers.

During the year over 1,500,000 electric lamps purchased by the Government were inspected by the bureau; 3,194 samples were put through a life test to determine whether the lamps supplied were acceptable and to obtain data necessary for revision of the standard specifications. Sections of a circular on street lighting were pub-

lished and tests on new street units for the District of Columbia were made. Studies of automobile headlamps were actively continued, and assistance on the headlight problem was given to congressional committees, the District director of traffic, and a number of States, especially Oregon, which has made all approvals of headlamps subject to bureau tests.

Methods of making more accurate measurements of frequency and means for getting these measurements into actual use have been the most important tasks in the field of radio communication. Accuracy was materially improved by using a simple harmonic amplifier to step up from audio to radio frequencies, and by stepping down from very high frequencies for which the wave lengths were measured directly on a parallel wire system. Standard frequency signals covering the range from 125 to 6,000 kilocycles were transmitted from the bureau and from Leland Stanford University at advertised times, measurements on many stations were made at the bureau, frequency indicators were calibrated for high-grade stations, and lists of standard frequency stations were published periodically. Improved frequency meters were developed, and a number of quartz plate oscillators were prepared for use in inter-laboratory, and especially international, comparisons of frequency scales. A wide variety of cooperative investigations has been kept up, particularly observations of fading and other variations of signals, and development of special equipment, such as direction finders, for other branches of the Government. Appreciable progress has been made toward the standardization of some radio apparatus, especially electron tubes.

The survey of Government telephone service, carried on for the past two years under the auspices of the Bureau of the Budget, has been continued and important additional economies have been accomplished both in the District of Columbia and in the field services. Special assistance has been given to the Veterans' Bureau in choosing the telephone equipment for several hospitals, and to the Navy Department in testing out fire-control equipment. At the close of the year the telephone engineering staff is largely engaged in preparation of the technical phases of the Government's defense in a patent suit arising out of war use of telephone equipment and involving a possible cost of several millions of dollars to the Government.

A technologic paper has been prepared summarizing the bureau's conclusions on methods of testing to determine when damage is occurring by electrolysis. This represents the results of many years' work in field surveys, and several months have been spent in discussions with representatives of the different utility interests involved, in order to make this paper accord with their experience, in so far as is possible. A progress report covering the first sets of corrosion samples (iron pipe) dug up from different soils has been issued through the American Foundrymen's Association. The samples have been carefully studied by many manufacturers and users of pipe.

Since magnetic measurements seem to promise the only practicable method of testing steel rope in service, efforts have been continued to avoid the difficulties which have hitherto prevented the actual

use of this apparently simple method. Numerous experiments have been carried out to determine the effects of tension in the wires, of wear, and of repeated stresses. These studies of the individual wires have now been carried far enough to permit the choice of conditions of magnetic measurement which will give really significant results on the assembled rope.

Modern safety codes are engineering standards covering construction and operation of equipment in various industries. They are largely formulated through committees in which makers and users of equipment as well as regulatory bodies are represented. The bureau is sponsor for nine of these codes, several of which cover the most hazardous of our industries. The most important is the National Electrical Safety Code, of which the fourth edition has been in preparation for the past two years. The first part of this revised code is in press, and other parts await only details of arrangement and computation of some tables of engineering data. The Elevator Safety Code is in course of printing, the Aeronautical Safety Code is ready for publication as soon as formalities of approval by the Society of Automotive Engineers and the American Engineering Standards Committee are completed, the Code of Colors for Traffic Signals is completed and likewise awaits only formal approval, while that part of the Lightning Code dealing with protection of persons and buildings is practically completed.

HEAT AND POWER

By joint resolution (Public Res. 65, 67th Cong.), the President of the United States was requested to call a conference of maritime nations to consider the adoption of effective means for preventing the pollution of navigable waters by oil. In this connection, the Bureau of Standards was requested to undertake the investigation of the character of oil-water mixtures and the development of oil-water separators designed for use on vessels on the high seas. The performance of shipboard separators under actual operating conditions at sea has been studied and the results thus far indicate that gravity separators will be the most satisfactory type to adopt for general use. Such separators may be expected to remove from 95 to 99 per cent of the fuel oil present in the ballast water on shipboard.

Gaseous explosions or explosive gaseous reactions have their most general application in the development of power in automotive engines. A study of the phenomena of explosive gas combustion has been in progress and very important new facts have been developed.

The increasing demand for economy in central power station output has led to the increased use of much higher steam pressures and temperatures. As a result new and more reliable engineering data on properties of water and steam are demanded. The bureau has been carrying forward part of a cooperative research program for the development of these data and has developed methods and equipment which will yield results comparable to those obtained for ammonia, which are the most accurate data of the kind extant.

Seeger cones are used throughout the ceramic industries to gauge the firing of kilns and to indicate the maturing of clay ware. There

is an insistent appeal from ceramists for adequate standardization of Seger cones. The standardization in progress involves not only temperature measurements but accurate control of rate of temperature rise and of the gaseous atmosphere surrounding the cones. The work is well advanced and results will be available to the ceramic industry in the next few months.

The bureau has equipment for testing the performance of aircraft engines at all altitudes. The probability of increasing demands for such performance tests incident to the development of commercial aviation led to the development of a simplified type of test of this kind which can be performed without the elaborate equipment of the Bureau of Standards, and may serve the same purpose where the highest precision is not needed. The results have been published.

Laboratory operations requiring the use of stirred liquids at low temperature are a source of extreme personal hazard due to the flammable character of the liquids commonly used. A series of nonflammable liquid mixtures has been developed which can be used for this purpose without danger and can be kept and handled in the ordinary way.

Information on problems relating to transfer of heat through materials ranging from insulated walls to condenser tubes has been requested by a very wide range of interests. To meet such demand this phase of the work has been given special attention. Measurements of heat transfers through a wide variety of insulating and building materials have been determined and results made available.

Some time ago it was determined by the bureau, in cooperation with the National Automobile Chamber of Commerce, the American Petroleum Institute, and the Society of Automotive Engineers, that the economic limitation on the use of heavier and hence less expensive motor fuels was fixed by the tendency of these fuels to contaminate crank-case oils and cause hard starting. Both these limitations have been investigated and the main facts regarding the former have already been published. The starting problem is still under investigation and experimental procedure has been developed.

The formulation of building codes, particularly as regards fire protection, requires further information as to the behavior of structural materials when heated. Tests of the mechanical strength of various structural steel and cast-iron shapes have been conducted under various conditions of temperature and load.

The resistance of roofing materials to ignition under fire conditions has also been investigated. Neither investigation is as yet completed.

In securing international agreement as to standards of temperature, some simple and practical method of specifying temperatures below 0°C . has been needed. A simple modification of the formula used at higher temperatures has been found which makes it possible to define, with adequate accuracy and simplicity, temperatures down to -190°C .

Interpretation of existing data on the ability of structures to withstand fire conditions rests upon inadequate knowledge of what intensity and duration of fire may be expected in any specified type of building occupancy. Tests have been made on a small scale simulating building fire conditions for several classes of occupancies. Equipment is now being installed which will make it possible to ex-

tend these studies to include a much wider variety of building conditions on a larger scale of dimensions.

Measurements of the specific heats of a large number of oils have led to the generalization that the specific heat of an oil can be inferred to an accuracy of a few per cent from a knowledge of its origin and its density, at least for the temperature range up to 100° C., and possibly for much higher temperatures. The results are being prepared for publication.

In connection with the formulation of a Safety Code for Automobile Brakes and Brake Testing the stopping ability of about 500 cars, including trucks and busses, has been measured. These measurements were obtained from cars in ordinary service in several cities, and from the data thus obtained tentative requirements for stopping distances have been adopted by a committee which is preparing the above-mentioned code. One of the results of this work has been the preparation of a report entitled "The Maximum Possible Deceleration of an Automobile," which discusses the various factors involved.

Another factor closely related to highway safety is the reaction time of the driver. Measurements were made of the reaction times of more than 50 drivers over a wide range of conditions, and values of from 0.3 second to more than 1.0 second were obtained, the average being slightly over 0.5 second.

OPTICS

An impression of the magnitude of the constructive activities of the optics division can perhaps best be given by the statement that 46 manuscripts were submitted and approved for publication in bureau, scientific, and technical papers.

Recent progress in determining the structures of various spectra has led to a general law describing the so-called sensitive lines which serve in making quantitative chemical analyses for impurities, the presence of which may entirely escape detection by ordinary chemical methods. The empirical data and this law have been applied during the past year in the classification of some complex spectra, while in other cases where the data are uncertain or lacking, they are being determined from spectral structures derived from absorption spectra, and the effect of a magnetic field on the spectral lines. This investigation is putting spectrochemical analysis on a firm physical foundation and at the same time furnishes new information on atomic structure, the mechanism of radiation, and the interpretation of many astrophysical phenomena.

The design and construction of improved apparatus has been completed this year, by means of which rapid and accurate measurements may be made of (1) spectral transmission between 100 and 0.01 per cent; (2) spectral reflection under conditions of diffuse illumination; (3) dominant wave length and purity with precision standard white light; and (4) integral transmission and reflection. The instruments, which have been thoroughly tested, proved highly satisfactory and are now in continual use for routine testing and research.

The values of relative visibility of the different spectral colors recommended in Bureau of Standards Scientific Paper No. 475 were

adopted by the International Commission on Illumination, meeting at Geneva in July, 1924, and also by the American Illuminating Engineering Society.

To study the erosion in 30-caliber service rifle and machine-gun barrels, it has been the practice to saw the barrel lengthwise. By this method the progress of the erosion in a single barrel can not be studied, but only the final condition after a prescribed firing program. To obviate this limitation, a camera has been designed for photographing the interior surface of the barrel. This consists of a periscope of unit magnification and small enough to permit entry into the bore of the rifle. The periscope projects an image of a small portion of the bore on a strip of motion-picture film, and the barrel to be photographed is slowly drawn along the periscope, the film being moved at such a rate that there is no relative motion between the image and film. The instrument is also excellently adapted for a visual examination of the interior of the barrel.

The index of refraction of a liquid can be readily measured, and the variety of important uses to which such a determination may be put as a control measurement in industrial processes is being rapidly extended. Increased accuracy in refractometers for this purpose is being demanded by industry, and the bureau has not only added to its equipment in order to make the more accurate tests demanded but is cooperating in the preliminary measurements necessary in their design, and has thus contributed materially to improvement in their performance.

A further demonstration of the usefulness of this bureau's radiometric instruments in solving astronomical problems was obtained during the summer of 1924. New measurements were made at the Lowell Observatory showing, among other things, that the unilluminated disk of Venus emits a large amount of infra-red rays. Hence, the question arises whether this planet rotates rapidly on its axis or whether the surface is still highly heated. The radiometric measurements indicate also that the planet Uranus is very cold. On the other hand, the measurements on Mars indicate temperatures considerably higher than previously estimated.

A paper now in press gives the results of an investigation of four methods of estimating planetary temperatures, especially as applied to the radiometric measurements on Mars. These four methods of analysis give concordant results, showing that the temperature of the surface of Mars, under a noonday sun, rises considerably above 0° C. This is in agreement with visual observations which indicate that the surface undergoes climatic changes.

Numerous constants characterizing the properties of the different atoms have been determined. The types of problems considered embrace critical potential measurements; excitation of soft and even visible X rays; general quantum dynamics, and its application to spectroscopy; resonance radiation phenomena; methods for the excitation of spectra, and the energy required for their production; the fine structure of spectral lines; the sizes of molecules and atoms; energy of activated atoms; photoelectric effect in vapors; and the scattering of light.

A new time-scale exposure machine of the nonintermittent type for determining the speed of photographic emulsions has been de-

signed and constructed. It is a precision instrument, designed primarily for research purposes and has, therefore, a more extended exposure range than is necessary for routine-emulsion testing purposes. With this machine a sector wheel is run at a constant speed by a motor, the speed of which is controlled both by governor and by clock signals through a new arrangement. By employing change gears, a range of speeds of the sector wheel is obtained in power-of-two steps from one-eighth second to 17 minutes 4 seconds per revolution. A description is in press under the title *A Nonintermittent Sensitometer (Time Scale Exposure Machine) with Clock Controlled Motor Drive*. Work now in progress with this apparatus has already given data of an important nature bearing on the theory of the silver bromide emulsion.

An investigation has been completed which shows the effect on the expansivity of glazes, of the method of preparing the samples. Previously the glaze material has been cast in molds or drawn into rods in order to make samples large enough for the micrometric apparatus. For the interference apparatus samples 0.5 mm. in length may be taken directly from the finished ware and measured. The expansion of the cast or drawn samples seldom agrees with that of the glaze taken from the finished ware. The results of this investigation show that expansion measurements made on cast or drawn specimens are of little value in matching the expansion of glazes and bodies, hence the failure known as crazing has been prevalent, although the glaze and body material were apparently matched. By measuring glaze taken from finished ware, its practical performance can be predicted.

A process has been developed for the manufacture of levulose, the sweetest of the sugars. The Jerusalem artichoke offers an inexpensive and prolific source of crude supply. The process consists of juice extraction, conversion, neutralization and defecation, isolation of levulose by lime precipitation, and crystallization, in which the most expensive reagent required is an ordinary grade of lime. In contrast with previous procedure which has necessitated the use of organic solvents for inducing crystallization, it has been found feasible to crystallize levulose from its aqueous solutions with facility. New data on the solubility of levulose have been determined. Of the levulose in the extracted juice, 80 to 85 per cent can be recovered as crystalline sugar.

It has been shown that the rotations of sugars and their derivatives can be evaluated from a knowledge of their structures, and conversely, that structures are often disclosed by comparisons of rotations. Revised rotations of the halogenacetyl arabinoses have been measured, and those of the methyl and several terpene glycosides have been shown to agree with calculated values. The bureau's researches in this field are proving valuable in disclosing molecular structures and in indicating ways for studying carbohydrate metabolism. They are being extended throughout the sugar group.

The physical properties of glass are subject to changes of considerable magnitude during the final stages of production, even when the composition and methods of melting are carefully controlled. Results of investigations show that by changing the heat treatment the density and refractivity may be materially altered

and that other properties can be greatly changed. These results will prove valuable in many problems in the manufacture and production of both optical and commercial glasses. They should aid in preventing many losses heretofore unavoidable and make it possible to increase the strength and durability of such articles as bottles, window glass, and glazes or enameled wares.

CHEMISTRY

As in the past, a great part of the energy of the chemistry division has been expended in the testing of materials submitted by various branches of the Government service. Little of this testing work can with any propriety be called "routine work," if this term is used in the same sense as it would be used in factory-control work, for not only are numerous difficult tests made on the samples examined, but from the results of such tests conclusions are drawn as to the quality and suitability of the materials in question. Hence a large proportion of the samples represents actual research work, and in many cases these apparently minor researches on samples tested require more work than that represented by many published original research papers. Methods of test are continually being devised or revised, much of this being made necessary by peculiarities of samples sent in for test.

A large number of specifications covering soaps, inks, paint materials, roofing materials, etc., were prepared for the Federal Specifications Board and have been adopted as United States Government standards. Others are in preparation, and several special specifications, including a number for chemical reagents, have been prepared for various branches of the service, or in cooperation with technical and scientific societies.

Renewals of five exhausted standard samples were prepared. Five new standard samples were added to the list during the year, making the total number now available 63, and four more are in process of preparation. The constant demand for the Bureau of Standards' standard samples by chemists from all parts of the world clearly shows the great value of this service.

A number of new and improved and simplified methods of chemical analysis were developed and several new methods of physical testing were devised.

During the past several years there has been a great interest in chromium plating and several commercial research laboratories have studied the problem. Thus far, however, there have been very few commercial applications. Several years ago this bureau cooperated with the Bureau of Engraving and Printing in the installation of an electrolytic process for reproducing plates used for printing securities, which process is still in successful operation. This year the bureau was requested to investigate the possibility of increasing the hardness of the printing surface. As chromium is the hardest metal known, it was first considered. In cooperation with the Bureau of Engraving and Printing, a process of chromium plating has been developed and applied for the past several months to both the nickel electrolytic plates and the steel plates. Satisfactory progress has been made and the results so far obtained indicate that this pro-

cess of chromium plating will prove entirely practicable and very useful for this purpose. Further studies are in progress on chromium plating and its other possible applications.

A careful review of all available information regarding the relative efficiency of different fuel gases in use has shown that for all ordinary uses of gas the purchaser is equally well served by the same amount of heat from gases of different heating values, and is really concerned only in getting the most potential heat possible for a dollar.

Important progress has been made in the study of the utilization of gas. Methods have been developed for determining with reasonable rapidity the margin of safety of gas appliances from three hazards—flash back, the blowing out of flames, and incomplete combustion. The work was done as part of a cooperative program for the improvement of gas appliances entered into with the American Gas Association, and the methods developed are expected to find immediate application in reducing the hazard from the use of gas.

MECHANICS AND SOUND

Reliability tests of elevator safety interlocks have been in progress continuously during the past three years. This work was originally undertaken for the city of Baltimore, but has since been extended to include tests for the Supervising Architect's Office and the city of Washington, and the tests will probably be utilized in the near future by a number of State safety commissions.

The importance of such tests is forcibly illustrated by the fact that the National Bureau of Casualty and Surety Underwriters, one of the largest groups of the kind in the United States, has granted a reduction in insurance rates on elevators equipped with interlocks which have successfully passed the reliability tests of the Bureau of Standards. A substantial saving in insurance rates has thus been made possible throughout the country. But far more important than this is the greater assurance of safety in elevators equipped with devices which have successfully passed these tests. The best statistical information available indicates that effective hoistway door elevator interlocks would have prevented about three-fourths of the fatal elevator accidents which have occurred in the past.

In the prosecution of this work the bureau has had the effective cooperation of elevator manufacturers. In a number of instances an interlock has been redesigned to correct weaknesses which developed during the first test. It may be said with assurance that the devices which comply with these test requirements represent a distinct advance as regards safety and reliability in passenger-elevator operation.

During the past year the sound laboratory has completed an extensive series of measurements on the acoustic properties of building materials. This is a question of great practical interest to-day, and one which grows faster than its solution.

Measurements of sound transmission have been made on a large number of plaster panels of standard construction, such as is ordinarily used in partition walls. Absorption and reflection measurements have also been made on a number of different plaster surfaces. For these latter measurements a new method has been developed

which permits measurements to be carried out on pieces of material of an area as small as 1 square foot.

The results and conclusions of these measurements can not well be given without an extended table. Much depends on the frequency (or pitch) of the sound used. The relative merit of different panels as regards opaqueness to sound of a certain frequency may be entirely reversed if sound of a different frequency is used.

As to reflecting power for sound, it has been found that in the case of plaster surface the reflection is determined by a very thin surface layer and is almost entirely independent of the material of the undercoat.

The results of this work are being prepared for issue as a bureau publication.

The aeronautic-instruments section has continued its program of cooperative research and development work on aircraft instruments with the National Advisory Committee for Aeronautics, the Navy, the Army, and other Government departments, and private concerns. In addition a much larger amount of routine testing of instruments has been done during the past year than ever before.

The most important aspect of the instrument development has been the design and construction of a number of special test instruments for studying the performance of heavier-than-air craft. A small gyroscope for use in a turn recorder, a small and highly sensitive galvanometer, and an electric-resistance type thermometer for measuring very low air temperatures, have been completed for the National Advisory Committee for Aeronautics. A camera sextant which can be used for obtaining photographic records of the sun's altitude was developed for the proposed polar flight of the Navy rigid airship *Shenandoah*. This instrument photographs the sun's image on a strip of bromide paper, as well as the image of a bubble level and suitable reference scales. A small developing tank accompanies the instrument and allows finished prints to be obtained within five minutes after the exposure. An altigraph compensated for air temperature has been constructed, and indicates altitudes determined by pressure and temperature with an accuracy of 1 per cent.

Fundamental theoretical and experimental researches have been conducted in connection with the design and improvement of aeronautic instruments. These various researches have four objects in view: (1) The simplification, improvement, and standardization of instrument mechanisms; (2) the improvement of instrument pressure elements; (3) the obtaining of performance data for various types of pressure elements, bearings, and mechanisms to be used for purposes of design and the dissemination of this information; and (4) the improvement of instruments and apparatus through fundamental research bearing on unsolved instrument problems.

In structures such as tall buildings, chimneys, bridges, and power transmission lines, it is necessary to make provision for the stresses imposed by wind pressure. The values for wind pressures now used by engineers are based on the results of experiments made at a time when experimental methods were in the early stages of development. The models were mainly thin flat plates, forms rarely used for structures. There is great need for data on models resembling actual

structures more closely. The bureau completed during the year an investigation of the distribution of wind pressure over a model of a tall building with the wind striking the face of the building at various angles. The measurements were made in the 10-foot wind tunnel on a model 8 by 8 by 24 inches, at speeds up to 70 miles per hour. The results are to be published as a scientific paper of the bureau. Measurements on a model chimney 8 inches in diameter and 5 feet high are also nearly completed.

The results of tests on 69 large columns of H-shaped section, tested in cooperation with the American Bridge Co. and the Bethlehem Steel Co., have been prepared for publication. The results of the tests indicate that the major factor in determining the strength of these sturdy columns, of slenderness ratio varying from 40 to 90, was the yield point of the material. Differences in manner of construction, slenderness ratio, and variations in test conditions produced relatively smaller differences. However, the value of the tensile yield point of the material determined under different test conditions varied considerably (over 12 per cent), so that consistent results could only be obtained by a uniform procedure of tensile testing.

The tests suggest that there is a need for investigation of the conditions under which tensile yield points may be measured consistently.

The amount of testing carried out for other branches of the Government in the field of mechanics and sound is constantly increasing. In the engineering mechanics laboratory alone tests have been made during the year for every executive department except the Department of Justice. The engineering-instrument section has calibrated 378 current meters during the year for the Reclamation Service, the Geological Survey, the Coast and Geodetic Survey, and other agencies. These meters are essential for gauging the stream flow of rivers and canals and are calibrated by towing them at different known speeds through still water in a testing tank about 450 feet long. Numerous tests have been made of various types of fire extinguishers to determine their suitability as fire-fighting equipment on vessels under the jurisdiction of the Steamboat Inspection Service. For the Supervising Architect's office tests have been made of radiator return-line valves and radiator air valves. Many aeronautic instruments, anemometers, pressure gauges, and paper testers have been calibrated for other branches of the service. The importance and necessity of the testing work can not be questioned, but the volume of the work is already so great that the tests can not be kept current without an increase in our staff commensurate with the demands made upon it.

STRUCTURAL, ENGINEERING, AND MISCELLANEOUS MATERIALS

Studies of data rendered available by the Emergency Fleet Corporation in its investigations of concrete ships show that by the use of sufficient steel, properly placed, the shell of the ship need be only 4 or 5 inches thick instead of the 14 or 15 inches demanded by usual concrete design practice. Deductions from these data have been applied to structural concrete design and may result in some important economies.

Measurements of the stresses produced by loads causing impact and rhythmic deflection were made in a concrete stadium during the progress of a football game, when it was loaded to capacity. The results indicated that the stresses due to all loads were low. Those caused by impact did not exceed 300 pounds per square inch.

Studies of a large amount of published data show that there is an apparent relation between the 7 and 28 day strengths of concrete. It appears from these data that the 28-day strength amounts to the 7-day strength plus thirty times the square root of the 7-day strength.

Building stones have been tested with relation to their resistance to weathering; shearing, transverse, and compressive strengths; permeability; thermal expansion; absorption; resistance to fatigue; and specific gravity. The data in so far as they refer to limestone are very complete, and pending the preparation of a publication the bureau will be pleased to furnish such information as can be given to correspondents. Much time has also been spent in collating the accelerated freezing tests of stone by salts with freezings while the stone is saturated with water. While there is a definite ratio between these two with most stones, there are too large a number of discrepancies to permit of a generalization, and further studies are being carried out.

The properties of mortars of cement, lime, and gypsum have been investigated under a number of conditions of use. Cement mortars when used as stuccos were studied largely in connection with various types of backing over frame construction. The bonding strength of mortars to masonry, such as sand-lime brick, was found to depend very largely upon the character of the absorption of the bonded material. The masonry should be capable of absorbing some of the water from the mortar and drawing the latter into some of its exterior pores. The adhesion of interior gypsum mortars to concrete was found to depend to a considerable extent upon the relative coefficient of expansion of the two materials. Its adhesion to other types of backing, such as lath, tile, etc., depends more largely upon such characteristics as roughness and mechanical key.

Gypsum and lime in uses other than mortars have been under observation to determine such properties as set and its regulation, waterproofness, acoustics, causes of failure under unusual conditions, and the physical properties of the raw materials as affecting the properties of the finished product.

It would appear possible to replace the imported silk used in parachutes by a special mercerized cotton, and also possible to replace the cotton used in the Portland cement bag container by jute. Both of these substitutes are generally cheaper in first cost, but whether ultimate cost would be less can not be stated, since the service tests undertaken to confirm the laboratory tests on which these conclusions are based have not been completed. At the same time it was found that if another substitute—reclaimed rubber—is used in the tread of automobile tires, the tires will not wear as well as ones in which the stock is made of crude rubber. Whether or not a low grade of Manila fiber could be made into as good a grade of rope as the high-grade fiber, obtained a few years ago with much less cost and less difficulty than it is at present, has not been definitely determined. The tests so far made have not been conclusive.

A study of glue as a substitute for casein in coating paper has shown that it can easily be used and an excellent product obtained. Experiments have also shown that when used as a size to replace part of the rosin now in use exceptionally good paper is produced. If later data are as promising as those obtained, it would seem that glue should obtain a wide use for this purpose.

A sample of crude rubber secured from trees grown in Haiti showed that products could be obtained comparable in all respects to those made from standard grades of plantation quality. As Haiti is farther north than any source of plantation rubber, the data are of particular interest.

Such paper fillers as clays, asbestine, talc, and gypsum have been studied in the bureau's semicommercial paper mill and the amount of filler retained determined, as well as the quality of the resulting paper. So little difference in the quality of the paper was noted that the main item to be considered would seem to be that of cost. A number of unusual fibers were also made into paper, and of these Caroa fiber from Brazil, but also occurring in the Philippines, was found to be of most promise and gave papers equal to those made from rag stock. Papers from cotton stalks did not appear at all promising.

The results obtained on service tests of sole leather show that any appreciable increase in the resistance of such leathers to wear must come from the application of mineral tannage. Chrome tanned soles wore from 30 to 100 per cent longer than vegetable soles. To obtain the required firmness and comfortable characteristics of the vegetable tanned leather and economy of production, it would appear desirable to supplement chrome tanning with a modified vegetable tanning. The possibility of the use of synthetic tanning materials to replace the imported vegetable tannins has been further investigated, paying particular attention to the formaldehyde condensation products of the sulphonic acids of phenol, cresol, and naphthalene. Their value is difficult to estimate due to the different properties in different respects, as rate and amount of fixation in the leather, and effect on the vegetable tannins with which they might be used. But it would appear that with further study their use could be brought about.

A total of 83 specifications has been prepared, submitted to the Federal Specifications Board, and promulgated by the latter, covering such items as tires, tubes, hose, hospital goods, erasers, cheese-cloth, tuck, denims, sheets, pillow cases, etc.

METALLURGY

About 30 per cent of the work of the division of metallurgy for the year has been carried on primarily for or at the suggestion of other Government departments or offices. While some routine testing has been done and many metallic materials of satisfactory and unsatisfactory performance have been studied, most of this Government work has been of a research nature, either on methods of testing or on the properties of metals.

The bulk of this work has been carried out for the Army, Navy, and Agricultural Department, the Federal Specifications Board, National Advisory Committee for Aeronautics, Coast and Geodetic

Survey, Panama Canal, Federal Trade Commission, Bureau of Foreign and Domestic Commerce, Steamboat Inspection Service, Bureau of Mines, and Panama Canal Commission. It has covered such subjects as the embrittlement on exposure of light alloys used for aircraft, protective metallic coatings, tarnish-resistant silver alloys, high-speed steel for cutting tools, air-hardening steels, permanence and wear resistance of steels used for gauges, fusible boiler plugs, testing zinc-coated materials, the study of invar tapes, etc. On account of the military nature of some of the work, reports on many projects are rendered only to the branch of the service that is directly concerned.

About 20 per cent of the work has been done at the request of and in cooperation with national technical societies, such as the American Foundrymen's Association, American Ceramic Society, American Welding Society, American Society of Mechanical Engineers, and especially the American Society for Testing Materials. A large amount of work has been carried out on methods of corrosion testing; on the properties of alloys at elevated temperatures, on the causes of blistering in cast-iron enameled ware, and on the testing of wire screen cloth.

About 10 per cent has been in the preparation of publications on previous work, in the preparation of circulars of information, in indexing published metallurgical literature and unpublished information available at the bureau, so as to make the division a clearing-house of metallurgical information, and in giving out this information verbally and by letter in response to the many requests for such information from the public, both by mail and by personal visits to the bureau.

About 5 per cent of the work is in connection with the research work of other divisions of the bureau, this work being balanced by the cooperation of the other divisions in metallurgical work.

The other 35 per cent of the division's activities is made up of research work taken up at the initiative of the division. This work deals chiefly with the fundamental properties of metals and with methods of testing. Several phases of the quenching process in the heat treatment of steel have been studied in detail. The properties of exceptionally pure zinc have been examined. The so-called abnormality of steel for carburizing and of high-carbon steel, the density of alloy steels in various conditions of heat treatment, metallographic etching reagents for alloy steels, and the resistance of metals to wear are other important projects.

As in the past, methods for the analysis of gases and gas-forming elements in steel have received much attention. The groundwork for the study of the effect of these impurities appears to be laid.

These problems are attacked both from the scientific and industrial points of view. The requests for work from other departments and from technical societies generally arise from industrial problems, and when these problems are taken up the work is, whenever possible, so shaped as to give fundamental scientific information as well. No sharp line can be drawn between scientific research and industrial research. Within a few months after the publication of a purely scientific paper by members of the staff of this division on

the quenching process another paper was published by a metallurgist of a large corporation describing a new product and process in which it was stated that the product had been improved and the process cheapened by applying some of the fundamental facts brought out in the bureau's paper.

There have been many instances of cooperation with the division by the metallurgical industry. The manufacturer of an electric brass-melting furnace has installed a furnace at the bureau without charge. With the addition of a special refractory lining worked out in the division the furnace has been adapted to the laboratory preparation of special alloys, for example, high-speed steels, which compare favorably with the best commercial product of similar composition. This furnace has considerably extended the range of metallurgical work which the bureau can do, and has been very useful in connection with several important projects.

Other manufacturers and producers have supplied free expensive alloy steel "test logs" for cutting tests, and some expensive metals and alloys. The advisory committees to the bureau on ferrous and nonferrous metallurgy have given freely of their time, and their advice has been most helpful. The market value of the cooperation extended without charge to the division in these various ways would amount to at least \$10,000.

Cost records, which have been very useful in the administration of the work, have been kept during the past fiscal year, and needed storage facilities have been provided which allow preservation of specimens and storage of supplies in a more orderly manner.

The funds for metallurgical work have not allowed the study of a fraction of the worth-while problems on which work has been requested. Very few new projects or new phases of old ones have been taken up, and attention has been centered on completing and reporting upon the old projects. Considerable progress has been made along this line, but in order to do effective work on the projects in hand it will continue to be necessary to deny most requests for work on new projects, even though they are of general importance to the industry and lie within the proper scope of governmental activities. Such denial is to be preferred to the abandonment of current projects and loss of the investment of public funds already spent on them. The division has the equipment needed in the study of most problems that arise within its field, but lacks sufficient personnel to extend its activities to many problems and to perform many services which the metallurgical industries feel can best be studied or performed by an impartial Government laboratory.

CERAMICS

During the year the investigation of the flints used in the ceramic industry was prepared for publication. This is one of a series of studies of the raw materials used in the ceramic industry, and the work comprises particularly the effect on the physical properties of the finished product of the various raw materials available. Work was also originated on a similar study of the feldspars of the country. The preparation of the necessary test specimens is now prac-

tically completed. Previous work along this line included investigations on the ball clays of the country and on whiting.

The studies of processes of manufacture as affecting the physical properties of ceramic products and of methods of testing have included investigations of drying of clay wares; the development of apparatus to measure the absorption of power in different parts of extrusion machines, for determining the abrasive hardness of glazes, and for studying the viscosity of glasses at high temperatures; and the building of a testing machine for determining the transverse strength of clays and other ceramic products. The study of the drying has advanced to the greatest degree, as a result of which it can be stated that the dry strength of clays is greater and drying difficulties less pronounced if the operation is begun at not over 65 per cent relative humidity and a temperature of 70° C., provided the temperature is not allowed to exceed 85° C. until the shrinkage has ceased. The studies covering extrusion, abrasive hardness, and viscosity have advanced as far as the development of the test equipment and the carrying out of some preliminary experiments.

The work in connection with fire brick for stoker-fired boilers has been completed and a publication is being printed. This work formed the basis for the Federal Specifications Board's Specification for Fire Brick, which has also been issued. The glass-tank block investigation has been very actively pursued, and five tanks composed of different types of refractories have been in service for approximately 30 days, during which about 400 pounds of glass were melted per day. This work is being continued, as the results to date are insufficient to form the basis of definite conclusions. The tests which have been made of plastic refractories show that in general these have all the qualities of first-class fire brick. They are filling a very important need, because they enable the user to repair settings without using special shapes which are often difficult to obtain. The work on hollow-tile walls and floor slabs of hollow tile and reinforced concrete has advanced sufficiently to warrant issuing two publications. Further work will be done in connection with the floor slabs. Larger slabs will be made to determine still further the increased resistance to shear offered by the tile.

To determine the effect of types of cast iron upon the quality of enameled cast-iron products a very extensive investigation has been originated from both the metallurgical and the enameling industries viewpoint. The iron is being prepared in the bureau's metallurgical division. The enameling is being done partly by the bureau and partly at commercial plants. Very considerable progress has been made, but definite conclusions are not available at the present time. It has been shown that it is possible to improve the life of protection tubes for thermocouples for use in glass furnaces by materially increasing the amount of alumina generally used in such bodies. In the study of white-cover enamels for sheet iron and steel it was shown that the coefficient of expansion is one of the major factors affecting the resisting power of enamels to mechanical and thermal shock. A study of a large amount of data scattered throughout the literature has shown that it is possible to compute the density and index of refraction of glasses from their composition.

THE OFFICE

During the year the office expended and accounted for funds aggregating \$2,095,000, including \$165,100 received by transfer from other departments for special researches.

During the year a special appropriation of \$173,117 enabled the bureau to acquire 8 acres of property completing the site originally planned for the bureau. The site has now a 1,300-foot frontage on Connecticut Avenue, and a total area of 43 acres.

Personnel actions involving 1,078 staff changes were handled for the staff, which now averages about 750 regular employees, exclusive of special assignments. On June 30 there were stationed at the bureau 317 professional, 240 subprofessional, 128 clerical, administrative, and fiscal, and 128 custodial employees, 30 experts employed on part-time basis, 46 details from the superintendent of the State, War, and Navy Departments Buildings, and 63 employees assigned for cooperative research under the industrial associateship plan, making 891 in all. During the year the staff was reduced by 84.

The average basic salary of bureau employees increased from \$1,824 to \$2,204 under the classification act which went into effect July 1, 1924.

The personnel changes during the year comprised 193 promotions, 546 miscellaneous changes, 141 entrances, 175 separations, and 23 intrabureau transfers, making 1,078 changes. During the year the bureau lost by death the chief chemist, Dr. William F. Hillebrand, a recognized leader in chemistry, known the world over for his basic work on rock analysis.

The bureau editorial committee received and considered 371 manuscripts prepared by members of the staff for publication. Of these, 183 were approved for publication by the bureau and 188 for outside publication. The publications actually issued comprise 21 scientific papers, 31 technologic papers, 131 circulars, and papers of other series. A complete list of all papers issued by the bureau up to June 30, 1925, will be given in the forthcoming revised edition of the bureau's list of publications, Circular 24. Twelve numbers of the Technical News Bulletin were issued, the May and June numbers being printed in accordance with a plan for putting the bulletin on a subscription basis. Fifty-one technical letter-circulars were issued, 135 special news items were released to the press, and a number of special articles on the bureau's work written for outside journals.

With the 2,269 new volumes added during the year, the scientific library contains 28,064 works, chiefly on physics, chemistry, and the special technologies. More than 650 scientific and other periodicals in the bureau's field are currently received. Complete sets of important reference journals are maintained, some of them the only complete sets in America.

About a thousand letters, exclusive of forms, are handled daily. A new automatic check now assures rapid and accurate reference filing. The modernized system of mail files is effectively used. Mimeographed jobs ranging as high as 72,000 sheets were completed on a thousand orders. Procurement orders, numbering 4,500, with necessary specifications, proposals, and vouchers, were prepared in the purchase section, based largely on data derived from the special

reference library of 15,000 scientific and technical catalogues maintained in this section. About 4,000 pieces of scientific and other equipment were received and accessioned. An effective system is in operation to permit inspection of all equipment of each type, of all assignments by divisions and sections, and according to accession, making an effective perpetual inventory system. Supplies for laboratory and other use to the value of \$76,000 were received, and \$73,000 worth were dispensed through the technical storerooms of the bureau, in which more than 6,000 separate items are regularly carried in stock. Mail, express, and freight movements for the bureau have been maintained without failure during the year. The bureau trucks have also hauled all freight for the Department of Commerce.

A total of 171,196 tests were completed during the year.

OPERATION AND CONSTRUCTION

The division operates three substations for generating, converting, and transmitting electrical power at many different voltages and frequencies, and provides stationary and portable storage-battery service; operates throughout the year two steam plants for furnishing high and low pressure steam for laboratory use; refrigerating plants for making ice and for temperature control for laboratory purposes; provides high and low pressure air, gas, vacuum, and hot and cold water service; installs new equipment and makes alterations to meet requirements of the laboratories; and cares for lawns, shrubbery, paths, roads, and drainage systems, and the propagation and care of flowers.

The bureau secured through the General Supply Committee the transfer of converting and transforming equipment originally purchased for the Government's central heating, lighting, and power plant and is gradually installing such equipment to replace that now rented from the local power company. A new motor generator set has been installed in the industrial building and a small motor generator set for use in charging storage batteries was installed in the north building. One of the large storage batteries was reconstructed by the addition of 66 new cells.

The electrical section has completed the installation of permanent wiring in the cement and ceramics laboratories, and has installed numerous pieces of electrical equipment. In addition the usual maintenance work has been performed on motors, generators, switchboards, transformers, electric ovens, and furnaces for the scientific and technical work of the bureau.

Numerous pieces of plumbing equipment have been installed, and the necessary maintenance work on fixtures and piping for supplying water, gas, air, vacuum, steam, and refrigeration for the various laboratories has been carried out.

The construction of a concrete stairway to connect the industrial building with the main group of buildings has been completed, and concrete pits for gas tanks used in the production of gas for experimental purposes have been constructed. The settings of three of the boilers in the north building were relined, and foundations were constructed for the installation of various types of laboratory equipment.

The new entrance road through the recently acquired land is about 75 per cent completed, and the work incident to the care of lawns, shrubs, flowers, roads, and drainage systems has been performed.

The actual supervision of the custodial work in connection with the bureau's buildings was done by this division as heretofore because of the impossibility of physical separation of custodial and technical services.

GENERAL RECOMMENDATIONS

POWER PLANT

The most urgent, material need of the bureau is a modern central power plant. As explained last year, the present power service equipment has been built up in disconnected, widely separated units, and the original plant was designed to serve but 2 buildings, while we now have 11. The Bureau of the Budget has authorized the project of a new power-plant building, and it is hoped that Congress will, in the forthcoming session, grant funds for this unit which will result in greater economy and flexibility of operation of our necessarily very complicated power service, and also render us independent of costly outside power supply.

ADDITION TO BUREAU GROUNDS

Congress authorized and made appropriation for the purchase of 8 acres of land to complete our frontage on Connecticut Avenue, thus providing a much-needed entrance to the bureau grounds with provision for future extension. This purchase was made for \$173,117. The site now comprises 43 acres with a frontage of 1,300 feet on Connecticut Avenue. The visiting committee in its report dated June 24, 1925, states: "The committee feels, looking into the future development of the bureau, that the Bureau of Standards will need for its future growth all of the land now owned by it."

The upkeep of this new land and the construction of roads across it to the main bureau buildings will require a slight addition to our fund for buildings and grounds.

MASTER TRACK SCALE

Another item of great importance that needs legislative attention is providing a building, probably in the Chicago district, for housing the master track scale which was purchased in 1918 and has since been stored for lack of housing facilities. This scale is needed as a standard to control the accuracy of other railroad scales and to weigh the test cars of the bureau, by means of which are determined all the freight rates of the country, over \$4,000,000,000.

MEDICAL AID

Authorization should be secured for the establishment at the bureau of a suitably equipped first-aid station with a resident physician, who would also have supervision over health conditions surrounding employees engaged in such lines of work as radium testing and fur-

nance operations. This would add greatly to the morale and sense of security of the personnel.

CARE OF BUILDINGS

As stated last year the number of janitors, laborers, and watchmen necessary properly to care for the buildings and grounds is entirely inadequate. There is actual danger in this situation and it should be remedied at once. The safety of the valuable buildings and equipment of the bureau is often dependent on this service, which is now very much below the standard set for ordinary office buildings belonging to the Government, in which no unusual risks are housed.

TRANSFER OF MAINTENANCE OF BUREAU'S BUILDINGS

It is urged that transfer back to the jurisdiction of the bureau be made of the services relating to maintenance, protection, and operation of the bureau's buildings and plant be consummated the coming year. This retransfer has been agreed to by the Bureau of the Budget officials, and the visiting committee has also strongly indorsed this transfer in its report of June 24, 1925.

The committee also considered the divided administration and responsibility which would ensue if the real control of the protection and maintenance of the bureau's buildings and the operation of the highly complex power plant were vested in Colonel Sherrill's office. This was also discussed with General Lord. The committee considers it would be most unwise to remove this responsibility and jurisdiction from the Director of the Bureau of Standards not only by reason of the remoteness of the bureau, but mainly by reason of the difficulty, if not impossibility, of separating the plant operation from the conduct of the work in the laboratories.

EXHIBITS

The bureau is frequently called upon to submit exhibits of its work and products at expositions and before associations of national scope, and it would seem desirable that adequate provision be made for this method of presentation of the results obtained by the bureau in science and technology before public groups that can profit from this type of contact.

WEIGHING AND MEASURING DEVICES

It is very generally contended by the manufacturers of weighing and measuring devices that questions involving the suitability of a type of construction for commercial use should be a function of the National Government rather than of State or local governments, as at present, reserving, however, to the State and local governments the right to determine the accuracy of each piece of apparatus introduced into the jurisdiction. On account of nonuniformity of requirements such manufacturers are unable to make a uniform product which will be accepted in the various jurisdictions, but are often required to incorporate minor modifications of construction

to meet the varying requirements, with resulting disturbance of production, larger stocks, and increased costs. Several years ago the Scale and Balance Manufacturers' Association, a national organization, secured the introduction into Congress of a bill to provide that the type of each such device, manufactured in or imported into the United States, should be passed upon by the Bureau of Standards, and that only approved types might be sold or imported. Hearings upon this bill (H. R. 4465) in the last Congress developed the fact that a very large majority of the manufacturers were in favor of its provisions. It is understood that the bill will be re-introduced into the coming Congress at the instance of the association.

The Bureau of Standards believes that the situation existing at present constitutes a real hardship upon these manufacturers without any compensating benefits and that the bill in question is well designed to correct this condition and to furnish adequate protection to all interests concerned—that is, the manufacturers and dealers, the users, and the public—and at the same time to safeguard the rights of the State and local governments.

CLINICAL THERMOMETERS

The Senate in the last session of Congress passed a bill making compulsory the testing by the bureau of all clinical thermometers used in the country. There seems to be a strong desire on the part of those interested to have legislation putting the control, either by license or test, of these instruments on which physicians depend so largely in Federal hands. If such legislation is enacted, it will require from \$100,000 to \$200,000 to administer, depending on the requirements to be enforced.

PATENTS

It would be desirable to provide, by legislation, for a uniformity of practice as to patent procedure in the Government service. The present situation is unsatisfactory and chaotic, although steps have been taken recently by the Chief Coordinator, through the President's Patent Board, to attempt to clarify the situation under existing law. The interests of the Government, the individual employee seeking a patent, and the public should be adequately defined by law so that a uniform, equitable policy of procedure could be applied. The Bureau of Standards, with its large staff of technical experts, is vitally interested in an equitable solution of this complex problem.

Since last year the bureau's work has resulted in some patentable ideas, in spite of the fact that the official emphasis is on fundamental work involved in standards and the testing connected therewith.

These ideas have been treated under four classes, one of which is illustrated by the discovery of means for making plastic gypsum. This invention is being taken out as a patent dedicated to the public. The gypsum manufacturers are already making the product. Their concern was merely that after starting manufacture they might not be held up.

Another is illustrated by the earth current meter developed for the study of and prevention of corrosion by electrolysis. It seemed necessary that this instrument should be of uniform standard in order to achieve satisfactory results. The bureau approved the employee obtaining a patent under his own name with the patentee's agreement that the licensing under his patent should be extended to other than one manufacturer in case the director of the bureau was not satisfied with the quantity of production, the quality of production, or the price charged for the instrument.

A third procedure is illustrated by the metal-spray gun. An employee was assigned the problem of developing methods of use of the metal-spray gun particularly for Government uses. He developed a new improvement in this gun. In this case it is expected that the patentee will assign his patent to the Government.

A fourth procedure is illustrated also in connection with the metal-spray gun, where an employee in the radio section conceived a special improvement in the use of the gun in connection with radio equipment. If it proves that his idea is patentable, we have approved his taking out the patent in his own name.

Another feature of the patent situation of great interest to the Government is the number of patent litigations involving mechanical, chemical, and electrical questions of great complexity now pending in the Court of Claims. I am informed there are now outstanding over a billion dollars' worth of patents in these fields, in which the bureau might be of great service in safeguarding the Government interest by reason of its experts in these fields. An extension of the bureau's personnel to put us in position to furnish the Government expert testimony and investigation would undoubtedly result in great savings to the Government.

BRANCH LABORATORIES

The bureau maintains branch laboratories at Denver, Colo.; San Francisco, Calif.; and Northampton, Pa., at a cost of \$23,695, for the testing of miscellaneous materials, mainly cement and other structural items.

The whole question of miscellaneous testing at the branch laboratories is worthy of serious attention. The General Accounting Office insists that all purchases be tested, as required by the specifications of the Federal Specifications Board. Consequently, the Government purchasing agents in the regions of our branch laboratories are calling for assistance beyond our resources.

In view of the large savings that have been made in Washington by using the laboratories of the Bureau of Standards for developing specifications and testing for conformance, it would seem worth while to study the character and volume of purchases on the Pacific coast in order to ascertain what would be a wise expenditure for that region. The objections to the use of private laboratories for Government testing are, of course, well known and need no discussion here.

States, individually and collectively, are beginning to demand more service from the Bureau of Standards in these matters in which a single common answer is desired. They recognize a duplication of

effort as well as working at cross-purposes by each State going it alone. In general they are quite willing to pay the cost of the service rendered. If the Pacific coast laboratory should be expanded to meet the United States Government needs, the next question that arises is as to the advisability of inviting the coast States to join in this common service.

Very truly yours,

GEORGE K. BURGESS,
Director Bureau of Standards.

BUREAU OF FISHERIES

DEPARTMENT OF COMMERCE,
BUREAU OF FISHERIES,
Washington, July 1, 1925.

HON. HERBERT HOOVER,
Secretary of Commerce.

DEAR MR. SECRETARY: In response to your request I furnish the following condensed report upon the work of the bureau during the past year.

The Bureau of Fisheries is concerned primarily in the conservation of our fisheries. This involves the greatest possible use of these resources without endangering the future supply. Public conscience has been aroused to the importance of conserving our aquatic resources; increasing numbers of recreationists are becoming interested in good fishing; those in the commercial fisheries are beginning to realize that unless the supply of aquatic foods is maintained their occupation will become unattractive and unprofitable; and, with the slowing down of recovery of the fishery industries from their post-war depression, there has come a recognition of the need for improvement in technological processes to better meet competition at home and abroad. All of these factors have resulted in an increased pressure upon the bureau for help, which is being granted to the fullest extent possible. Demands for assistance in the fields of fisheries biology, propagation, and technology have continued to increase until now the bureau's facilities for meeting them are inadequate.

To meet this increased demand for service the bureau has centered its efforts on projects of basic importance and has greatly widened its sphere of cooperation with State, municipal, and private agencies in the fields of biology, propagation and distribution of fishes, and the collection of fishery statistics. Without the helpful aid extended by these agencies, which now enables the bureau to render more efficient service without greatly increasing its expenditures, bureau activities would suffer severe curtailment.

In spite of the increase of the activities of the bureau which has been made possible by such cooperation and careful economy in the conduct of the bureau's business, the demands for service still far outstrip our resources. We are in real need of additional facilities for the conduct of biological and technological investigations, for an expanse of fish-cultural activities, for annual inventories of our fishery products, and for the proper administration of our Alaskan fisheries.

FISH-CULTURAL ACTIVITIES

Public interest in improving the fisheries of interior waters and restocking depleted areas has increased to such an extent as to render Federal and State agencies incapable of keeping pace with the demand

for fish. As this demand has far exceeded the limits of production, various expedients had to be adopted: First, the allotment of fish to applicants has been reduced, thus affording temporary relief; second, the bureau has striven to produce the maximum output with existing facilities and to develop the basis for large-scale production at a few especially advantageous points at lower unit cost than is possible under the present system; third, the cooperation of public-spirited associations and individuals in the rearing of fingerling bass, trout, and other species has been obtained and promises to become a highly important adjunct to State and Federal operations.

In 1924 an experimental pond system, about 15 acres in area, produced 150,000 three to six inch black bass at an outlay of about \$2,500. The losses resulting from planting fish of this size are low, and the stocking of waters with such fish is much more effective than with newly hatched $\frac{1}{2}$ -inch fry. The expansion of this large-scale production method is dependent upon facilities for purchasing a number of well-located sites.

The attention directed by the Secretary of Commerce to the possibilities in the rearing of fish to the fingerling stage by private associations and individuals has served to stimulate a widespread interest in the subject, and to date about 25 such projects have been initiated. The bureau is cooperating to the limit of its ability to make these experiments a success. The assistance rendered includes such services as advice relative to sites, construction of rearing boxes, feeding, etc. In some instances a brood stock of warm-water species has been furnished.

In addition a number of owners of waters suitable for trout culture have constructed troughs and ponds for the rearing of small fingerling fish to be turned over to them from the bureau's trout hatcheries. In every instance an attendant to care for and feed the fish during the summer will be provided at the expense of the owner. The distribution of the stock in open waters will be made in September and October in the majority of cases, but where facilities permit it is the intention of these volunteer fish-culturists to carry the fish through the winter and liberate them as yearlings in the succeeding May or June. The supply of fish thus reared will for the most part be divided equally between the owners and the bureau, and the bureau's share will be utilized in stocking suitable public waters in the immediate region concerned. The prosecution of work on this basis will not only permit a more thorough stocking of the waters in the sections where it is conducted, but it will relieve the congested condition of the bureau's hatcheries during the early spring and obviate the necessity of planting large numbers of trout at a time of year when the waters in many parts of the country are not in the most favorable condition to receive them.

A number of the States are taking an interest in this cooperative nursery work, and there is ground for the belief that after it has become well established the bureau will be able adequately to meet public demands for species of fish adapted to pond culture, thus obviating or at least greatly reducing the need for additional hatcheries. The various projects can be inspected at frequent intervals and the distribution accomplished by means of the bureau's present organization at little or no additional cost to the Government.

Up to the present time the greatest expense connected with the bureau's fish-cultural activities has been for the movement of fish from one section of the country to another. This applies with especial force to the work in the upper Mississippi River Valley. The impossibility of producing warm-water fishes at the permanently established stations in sufficient numbers to meet the demands has compelled the bureau to rely upon its rescue stations along this river in an effort to make up the deficiency, necessitating a considerable expenditure for transportation of such fish to distant points in the eastern and southern parts of the United States. With the establishment and operation of nursery ponds the bureau will no longer be required to make this heavy outlay for distribution.

The number of fish rescued from the overflowed lands along the upper Mississippi River and distributed amounted to approximately 65,000,000, or less than half the output of the preceding year. As in past years, practically all of the fishes rescued were inoculated with the glochidia of fresh-water mussels by the rescue force. This work is of material assistance in maintaining the valuable pearl-button industry, which gives employment to a large number of fishermen, and both the button manufacturers and the clam fishermen are convinced that it is resulting in much good.

Several advantageous exchanges of trout eggs were made with various States and foreign Governments during the year. Brook-trout eggs were received in return for eggs of the Loch Leven, rainbow, and black-spotted trout, resulting in a considerable saving, because ordinarily the bureau is compelled to purchase most of its brook-trout eggs from commercial fish-culturists, whereas eggs of the other species are collected from wild fish at comparatively small cost.

Appreciable cooperative assistance has been received from State fisheries authorities, and in some instances a material saving has been effected through the exchange of fish and hatchery equipment. On several occasions the bureau has lent its distribution cars for the transportation of fish produced by the States, thereby lessening its own distribution costs. On other occasions it placed at the disposal of the States the services of its experienced men to assist in the location and establishment of hatcheries.

The propagation of important commercial species has been conducted on a large scale, and the output of cod, winter flounder, shad, glut herring, sockeye salmon, pike perch, and pollock exceeded that of 1924. The work of salvaging the eggs of offshore fishes, such as the cod and haddock, taken by commercial fishing vessels was continued. As it is impossible to bring the eggs from the offshore banks to the hatcheries for incubation, they are fertilized and returned to the water on the natural spawning areas, thus preventing their loss when the fish are cleaned and the refuse discarded. A record collection of winter-flounder eggs was made at the Boothbay station.

Shad-hatching operations at Bryans Point, Md., were quite successful, notwithstanding unfavorable weather conditions and a relatively small run of fish.

In the Great Lakes region, through the cooperation of the States, the hatching of whitefish, lake trout, and ciscoes has progressed

quite favorably despite the fact that few eggs are now obtainable from Canadian sources. The most noteworthy development has been the enforcement of the Michigan law, which requires the commercial fishermen to deliver to either the State or Federal authorities, without cost, all eggs taken. The continued enforcement of this law will result in a considerable saving in the cost of egg collecting.

Nearly all Pacific salmon hatcheries are now attempting to hold young salmon in rearing ponds in order to stock the waters with fish of the larger fingerling size. Both State and Federal agencies are conducting experiments along this line.

The following table shows the increased collections of eggs of several important species of fish as compared with 1924:

Species	1925	1924
Shad.....	25,000,000	16,000,000
Glut herring.....	336,700,000	222,000,000
Sockeye salmon.....	64,000,000	46,000,000
Pike perch.....	402,000,000	333,000,000
Cod.....	1,356,823,000	1,000,000,000
Pollock.....	430,000,000	401,000,000
Winter flounder.....	2,878,000,000	2,404,000,000
Rainbow trout.....	13,776,000	11,700,000
Loch Levan trout.....	12,160,000	7,920,000

BIOLOGICAL INVESTIGATIONS

In the past the people of the United States have been generally apathetic toward scientific investigations of our fisheries, but recently there has been a surprising growth in interest in these problems of fishery conservation. Among the contributing factors mention may be made of the menace of exhaustion of some of our important fresh and coastal water species, the growth in numbers of anglers and organizations interested in good fishing, and an awakening to the harmful effects of industrial pollution upon aquatic life and upon the use of water for recreational pursuits. Concurrent with this development is a growing interest in the possibilities of aquiculture—water farming—in its manifold phases.

As a result the demands for assistance made upon the division of scientific inquiry of the bureau by State, municipal, and private organizations have been numerous and pressing. In fact, they have far exceeded the ability of the bureau to respond, because of lack of funds and personnel. Through cooperative arrangements with several State fish commissions, however, much more has been accomplished than would have been possible otherwise, and by increasing such cooperation an effort is being made to expand the scientific work of the bureau and in this way keep more nearly abreast of present-day needs without correspondingly increasing the expense to the Federal Government. Joint investigations by Federal and State Governments include a study of the oyster resources of the State of Georgia, investigation of the mullet and other fisheries of North Carolina, and salmon investigations in cooperation with the States of California, Oregon, and Washington.

The proper care of our fisheries necessarily depends upon an accurate knowledge of the biology of the various species of fish and shellfish sought after by commercial fishermen and anglers. The primary

object of these investigations is to determine the maximum yield which each fishery is capable of supplying without impairment of the resource. Absolute accuracy in such determinations is manifestly impossible, but it is possible to reach an approximation close enough for all practical purposes. Any such measure of the productivity of a fishery resource must depend upon a knowledge of the feeding habits of the fish in question, their breeding habits, the requirements for the survival of the eggs and young fishes, their rate of growth, the age at which they enter the commercial catch, the age at which they begin to reproduce their kind, and various other similar matters.

However, the productivity of a given fishery fluctuates from year to year, due to causes quite beyond the influence of human agency. The nature of these causes and the exact effect which they have upon the abundance of fish are matters of fundamental importance to a solution of the problems arising in the care of the fisheries. The discovery of these causes depends not alone upon a knowledge of the biology of the fish themselves, but also upon an understanding of the biology of the various forms of life on which the fish depend for their food and of the physics and chemistry of the sea and of fresh water. It is essential, therefore, that attention be given to the sciences of oceanography, limnology, and general marine and fresh-water biology.

During the past year investigations of this character have been conducted and additional information has been secured regarding oceanic currents in the Vineyard Sound-Nantucket Sound region, plankton and temperatures along the coast of Maine, in Massachusetts and Cape Cod Bays, and on Nantucket Shoals, and regarding certain chemical characteristics of the water in Long Island Sound where pollution has played so large a part in the depletion of the oyster supply. Observations on the occurrence, growth, and feeding habits of larval fish also have been made.

Artificial propagation is a highly important aid to the conservation of our game and food fishes and should be developed to a high degree of efficiency. In the studies on the nutrition of fish particular attention has been given to the necessity of vitamins in fish food. The addition of small amounts of these essential dietary elements to the regular foods has had a marked effect in reducing mortality and increasing growth. Several fish parasites, which frequently cause serious losses at fish-cultural stations, have been studied, and in some cases methods of treatment have been developed. The fish-cultural station at Holden has recently been made a center for various experimental fish-cultural investigations. Other experiments in the artificial propagation of fishes, including pond culture, have been conducted at the biological station at Fairport, Iowa. In general, the scientific staff of the bureau is giving more attention to the study of fish-cultural problems and is extending the scope of these investigations.

The salmon fisheries are among the great fisheries of the world. More than 65 per cent of the entire production of salmon occurs on the Pacific coast of North America in Alaska, British Columbia, and the Pacific Coast States. These fisheries are, therefore, in particular need of scientific care. The administration of the fisheries of Alaska is in the hands of the Department of Commerce, and the heavy responsibility which this imposes is fully appreciated. In addition,

however, there is an opportunity for service in the constructive care of a great fishery which is without parallel. Appreciating the necessity for accurate biological information if this responsibility is to be properly discharged, various investigations have been conducted, and the results are being used as far as possible to determine the regulations to be enforced.

During the past year the study of the migrations of salmon in the ocean has been continued. Tagging experiments were conducted in southeastern Alaska and in the coastal waters bordering the States of California, Oregon, and Washington. Investigations of various important spawning areas in Alaska and on the Columbia River have been made, and weirs have been maintained in order to take a census of the salmon ascending to the spawning grounds in the Karluk, Letnik (Afognak), and Chignik Rivers, and in streams tributary to Alitak and Yes Bays. Age determinations of representative samples of the runs of salmon into several of the more important streams have been continued, with the primary object of securing data bearing on the relative success of various spawning seasons. A particularly intensive study has been made of the important run in the Karluk River.

At the instance of the International Fisheries Investigation Federation, representing the Dominion of Canada, the Province of British Columbia, the States of Washington, Oregon, and California, and the Federal Government of the United States, it is planned to increase materially the salmon investigations.

In cooperation with the Dominion of Canada, acting through the International Fisheries Commission, an extensive investigation of the Pacific halibut has been begun. One of the leading men in fishery research has been secured to take charge of the investigation and is now at work perfecting plans and organization. The halibut resources of the Pacific have been seriously depleted and are urgently in need of constructive, scientific regulation. The average annual yield of this important fishery of the Pacific coast of North America is about 54,000,000 pounds, of which about 80 per cent has been taken by American vessels.

The study of the clam fishery and resources of Alaska has been continued, and a report presenting the results has been published. This fishery, although comparatively new, has shown violent fluctuations, which can, in part at least, be ascribed to the evil of over-fishing. These investigations indicate that the clam beds of Alaska are incapable of withstanding the intensive digging common on more southern beaches, and that their maximum yield is considerably lower. Restrictive measures have, therefore, been imposed, which will tend to reduce the intensity of the drain on this valuable resource.

In 1923 the catch of mullet in the South Atlantic and Gulf States exceeded 39,000,000 pounds, valued at \$1,585,000. This is the most important food fish of the South, representing 10 per cent of the total catch of fishery products. Recently much concern has been evidenced regarding the future of the fishery and the need for more restrictive measures. An investigation begun during the year gives promise of results of great value. Special attention has been given

to a study of the extent to which the fish of this species are segregated in the various localities, and evidence has been secured which indicates strongly that the supply of fish in one locality is independent of those in other localities. In certain instances evidences of depletion have been made a basis for recommendations to the State officials for the proper care of these resources. These recommendations have been favorably received, and it is expected that they will be incorporated into law in the near future.

Investigations of the life histories and migrations of the cod, pollock, and haddock have been continued. During the past year over 15,000 tags have been attached in an effort to determine the nature of the migrations of these important food fishes. The results of the previous year's experiments were corroborated, in that a distinct southwesterly migration during the winter to the coast of New Jersey was again clearly demonstrated in the case of the cod. This study of these important bank fisheries has been expanded during the year by incorporating an investigation of the history of the eggs and young larvæ in the region of Massachusetts Bay and Nantucket Shoals. There is thus under way a comprehensive study of these fish, which, when completed, will provide information regarding the entire life histories from the time the eggs are spawned to maturity. Particular attention is being paid to the critical times in the early life when conditions varying only slightly from the normal may have a serious effect upon the survival of the eggs and young fish.

Near the close of the fiscal year an investigation of the mackerel fishery was undertaken. Although not one of our greatest fisheries, it is an important one on account of the high value of the product. Tagging experiments have been begun in Massachusetts and Cape Cod Bays and in the region of Woods Hole, and a start has been made toward the collection of important vital statistics of the mackerel catch in several localities.

The oyster fishery of the Atlantic coast was formerly the most valuable of all our great fisheries, but is now sadly depleted, although still holding high rank. The causes of this depletion and possible remedies have been the subject of investigation for a number of years. This work has been entirely reorganized during the past year, and it is believed that it is now on a more scientific and practical basis than ever before. Studies have been continued on the causes of the serious diminution in the productivity of the oyster-producing areas in Long Island Sound and adjacent waters, and a survey was made of the oyster resources of the State of Georgia. It is believed that the oyster resources of some of the Southern States are capable of great development, which may be initiated and guided through the sort of investigations which are being carried on. Experiments in the artificial propagation of oysters have been continued with encouraging results.

Other investigations during the year include those relating to the control of mosquito propagation in the Southern States, the life histories and relationships of the whitefishes and other coregonines of the Great Lakes, the fresh-water mussels of the Mississippi Basin, the salmon and smelt of New England, and the fouling of ships' bottoms (investigated in cooperation with the Bureau of Construction and Repair of the Navy Department).

RELATIONS WITH THE FISHERY INDUSTRIES

The number of persons engaged in the fisheries and fishery industries of the United States and Alaska exceeds 190,000; the investment amounts to about \$200,000,000; the annual production of fishery products by fishermen is about 2,600,000,000 pounds, valued at about \$90,000,000; the output of canned fishery products has an annual value of about \$72,000,000; and the production of by-products is valued at about \$10,000,000. In 1924 the ports of Boston and Gloucester, Mass., and Portland, Me., received from fishing vessels about 183,000,000 pounds of fish, valued at about \$7,000,000, and at the port of Seattle, Wash., about 28,000,000 pounds, valued at \$2,700,000, were landed.

The available statistics indicate that the rapid recovery of the fishery industries from their postwar depression has ended and that we may expect a more gradual development in the future than has been the case during the years 1919 to 1923. In general, the production of fishery products in 1924 has increased, but prices lower than in 1923 are obtained. This would seem to indicate that the present need of the fisheries is to develop a greater market to absorb the production of fish and fish products. It is gratifying to note that the industry is giving greater attention to the production of better quality fresh fish, and a definite effort is being made by the fish trades, through the fisheries associations, to raise the standard of quality and apprise the general public of the value of fish as a regular source of protein in the diet.

The bureau's most direct contact with the fisheries and fishery industries is through its division of fishery industries, which, during the fiscal year 1925, has continued to aid the industries by its collection, compilation, and publication of fishery statistics, its technical research, and its dissemination of practical information to the industry.

Statistics on landings of fish at the ports of Boston and Gloucester, Mass., Portland, Me., and Seattle, Wash., were collected and published monthly. Statistics of the cold-storage holdings of fish were collected by the Bureau of Agricultural Economics in the Department of Agriculture and published monthly by the Bureau of Fisheries, as in previous years. Statistics on canned fishery products and by-products for the calendar year 1924 were collected and published early in 1925, and those on the production, holdings, and consumption of animal and vegetable oils in the fishery industries were collected quarterly and furnished to the Bureau of the Census for publication, as in previous years. The shad fishery of the Potomac River was canvassed for the 1925 season, and general fishery canvasses were made of the South Atlantic and Gulf States for the calendar year 1923. Statistics of the former have been compiled and published, and those of the latter are now in course of preparation for publication. Statistics of the fisheries of the Pacific Coast States for 1922 were published, and another less-detailed canvass for the calendar year 1924 was made.

As the fisheries of the United States are for the most part approaching the limits of exploitation and many of our more important littoral fisheries are actually seriously depleted, it is becoming very important that we have more complete information on what is

actually taking place each year. In other words, we need complete annual statistics. The most recent statistics now available on the personnel, investment, and yield of our fisheries are as follows: New England States, 1919; New York, New Jersey, and Delaware, 1921; Maryland and Virginia, 1920; South Atlantic States, 1923; Gulf States, 1918; Pacific Coast States, 1923; Mississippi River and tributaries, 1922; and the Great Lakes, 1922.

With the present funds and personnel of this division it is impossible to cover each of the geographical sections more often than once in five years. Our experience in dealing with fishery problems leads to the belief that such a program is inadequate for the present needs. A serious effort is being made to interest the several States in this most important feature of fishery administration. Having well-established organizations provided with funds derived directly from the fisheries, it should be possible for the States to undertake this work with a minimum of expense and a maximum of efficiency, leaving to the Bureau of Fisheries the matter of correlating their activities and advising them in the conduct of their statistical programs.

At the urgent solicitation of men in the crab industry of Chesapeake Bay, who were becoming alarmed at the marked decrease in the stock of crabs from which they derive their raw material, the bureau undertook to investigate their problems. A preliminary survey was made, in which it was found that there was a loss of over 50 per cent in converting the so-called "peeler crab" into the "soft crab," due to careless buying methods. A comparison of the fragmentary information available also indicated a distinct relationship between the catch of crabs in the State of Virginia and that in the State of Maryland, leading one to believe that the fishery of one State is dependent upon what occurs in the fishery of the other. The two States involved have accorded the bureau their hearty support, and the investigation is being continued with the hope that a solution of the problem will be ultimately attained.

Upon recommendation of the North American Committee on Fishery Investigations, representing the Governments of Canada, Newfoundland, France, and the United States, the bureau has been urged to collect additional statistics on the important mackerel fisheries of the western North Atlantic. The data required are in the nature of continuous statistical records of the sizes of mackerel. It is hoped that such data, collected over a period of years, will explain the severe fluctuations in abundance to which this species is subject, and possibly provide a basis for predicting the character and size of the catch in advance of the fishing season. A preliminary survey of the means and methods to be used in carrying out this program is now being made.

In its technological work it is the policy of this bureau to select broad fundamental studies which are urgent, which promise to be of greatest value to the largest number, and which the industry itself is least capable of undertaking. Few realize the advancement which can be brought about by means of well-directed and adequately supported technological investigations. This is especially true of the fishery industries, and it is therefore urgent that that bureau should demonstrate the importance of such research. This work should bring about the production of better products and make possible

the more efficient utilization of the raw materials of the fisheries, thereby benefiting the entire public and contributing to the conservation of our fishery resources.

The sardine-canning experiments, which led to the development of a new process of preparing fish for canning as sardines in California, were continued in Maine. The new method depends on rapidly moving hot air to cook and dry the fish at the same time, instead of drying and frying in oil or steaming and drying preparatory to canning. Better packs are being produced, and the indications are that production costs will be lowered. The new process was demonstrated successfully both in Maine and in California, and engineering companies will design and construct equipment guaranteed to operate successfully. Even with these assurances there is a reluctance on the part of canners to scrap old equipment and purchase new until a venture on a commercial scale has been demonstrated to be successful both technically and economically. It is evident that some plan must be formulated to develop the process on a large scale and eliminate most of the risk taken by the canners. This phase of the matter is now receiving attention.

Copper oleate is now being used in the fisheries as a preservative of nets and ropes. Many favorable reports have been received from fishermen, and as its use becomes more widespread it should result in a substantial saving to the fishermen. Cases of dissatisfaction may usually be traced to wrong application or its use in a manner that is not intended. The real worth of copper oleate can not be determined until accurate data are available upon cost of treatment and total length of life of line so treated. Practical tests of this nature are now under way.

Due to investigations by the bureau on the iodine content of sea foods, it is now well known that such foods contain a great deal more iodine than do most other foods. Since goiter and thyroid disorders are caused by lack of iodine being ingested, the liberal use of sea foods in the diet should assist in overcoming this deficiency, especially in the so-called "goiterous belts," where the iodine content of foods and water is below normal. During the past year analyses were made which established the presence of iodine in canned and preserved sea foods in amounts comparable to that contained in fresh sea foods. The results of these analyses have been published.

One of the greatest problems in the fishery industries is an adequate utilization of its wastes. Less than half the supply of waste products of the fisheries is now being used and present processes of offal reduction are in general quite inefficient, in many cases resulting in the loss of valuable proteins in the press liquors and in the pollution of coastal waters. Investigations are now under way which promise to develop processes that will increase the utilization of wastes, make them more efficient, and possibly produce better and more valuable products.

ALASKA FISHERIES

Distinct progress in conserving the salmon fisheries of Alaska has already been made as a result of the act of June 6, 1924, which gives the Secretary of Commerce full authority to limit or prohibit any or all fishing operations. The outstanding accomplishment has been

a greater proportionate escapement of salmon to the spawning grounds than has occurred in many years. Undoubtedly this will reflect itself in due time in increased catches of salmon.

There was more intensive and comprehensive enforcement of the laws and regulations than ever before, 119 persons, exclusive of crews on 19 vessels, having been engaged therein during the height of the season. The Commissioner of Fisheries spent most of the season in Alaska for the purpose of observing the effect of the new law and regulations and to consider the necessity of modifications. As a result some changes in the regulations were made during the progress of the season. On December 2, 1924, new regulations effective in 1925 were promulgated. These regulations named 12 areas in which fishing is limited or prohibited. In 76 specific localities within these areas all commercial fishing for salmon is prohibited. Regulations pertaining to the herring, shrimp, clam, and crab fisheries were also included.

The catch of salmon in the southeastern and western districts of Alaska declined 18 and 32 per cent, respectively, this being attributed in part to the additional restrictions imposed on operations under the new law and regulations. The catch increased 161 per cent in central Alaska, where there was a very heavy run of hump-back salmon. The net increase over 1923 in the catch of salmon for all of Alaska was approximately 3 per cent.

The number of persons employed in the fishery industries of Alaska in 1924 was 25,194, the active investment was \$62,660,637, and the total value of products was \$40,289,273. The output of canned salmon was 254,155,920 pounds, or 5,294,915 cases on the basis of forty-eight 1-pound cans each, valued at \$33,007,135, an increase of approximately 5 per cent in quantity and of less than one-half per cent in value, as compared with the preceding year.

Counts of salmon ascending to the spawning beds were again made at Karluk, Chignik, and Alitak Bay as a part of the effort to secure systematic data regarding the ratio which escapement must bear to the runs of salmon in order to maintain the supply in perpetuity. A study of migration routes of salmon in southeastern Alaska was inaugurated in 1924 by the tagging of 2,716 salmon at five different localities. Subsequently 662 of these fish were retaken at various places. An investigation of the clam resources of central Alaska was continued in 1924, attention being given to the beds in the vicinity of Cordova and at Snug Harbor, Cook Inlet, and Kukak Bay, Shelikof Strait.

The first of the annual closed seasons of three months each provided for by the North Pacific halibut treaty of March 2, 1923, extended from November 16, 1924, to February 15, 1925, inclusive. This measure, designed to protect and conserve the halibut fishery, has met with wide approval, and the industry has entered faithfully into both the letter and spirit of its provisions.

ALASKA FUR-SEAL SERVICE

Computations of the number of animals in the American fur-seal herd, which resorts to the Pribilof Islands, indicated that there were 697,158 as of August 10, 1924. This was an increase of 44,150

animals. The total take of sealskins in the calendar year 1924 was 17,219.

In the season of 1924 a reserve of 8,572 three-year-old males was made. The increase in the size of the herd in recent years has made it necessary that more than the minimum of 5,000 three-year-old males required by law be reserved each year for future breeding purposes.

In the fiscal year 1925 there were sold at St. Louis 25,395 fur-seal skins taken at the Pribilof Islands. The aggregate price was \$713,276.28. The sales were composed of 20,037 black-dyed skins, 4,331 brown-dyed (Chataigne d'Or), 1,010 raw salted, and 17 in various stages of processing.

The 787 blue and 15 white fox skins taken in the winter of 1923-24 were disposed of at public auction on October 15, 1924. The gross proceeds of the sale were \$50,385.50. In the season of 1924-25, 681 blue and 28 white pelts were secured, a total of 709. The foxing expert employed during the past two seasons completed his work and the plans outlined for the systematic feeding and development of the herds on the Pribilof Islands will be followed in so far as practicable.

Very truly yours,

HENRY O'MALLEY,
Commissioner of Fisheries.

LIGHTHOUSE SERVICE

DEPARTMENT OF COMMERCE,
BUREAU OF LIGHTHOUSES,
Washington, July 1, 1925.

HON. HERBERT HOOVER,
Secretary of Commerce.

DEAR MR. SECRETARY: In response to your request I furnish the following condensed report upon the work of the service during the past year:

MORE IMPORTANT ACTIVITIES OF THE LIGHTHOUSE SERVICE DURING THE YEAR

Important progress has been made during the year in the extension of the system of radio fog signals and their use in navigation. Two additional stations were established during the year on Five-Fathom Bank Lightship, N. J., and Lake Huron Lightship, Mich., making a total of 13 such stations in operation at the close of the fiscal year with 6 additional lightships equipped for relief. The Lake Huron Lightship radio fog signal was placed in commission on June 12, 1925, and was the first signal of this kind on the Great Lakes. Equipment was purchased for 15 additional modern tube type radio fog signal stations to be located at Portland Lightship, Me.; South Pass Lighthouse, La.; Galveston Jetty Lighthouse, Tex.; Los Angeles Harbor Lighthouse, Calif.; Point Arguello Lighthouse, Calif.; Point Sur Lighthouse, Calif.; Cape Blanco Lighthouse, Oreg.; Grays Harbor Lighthouse, Wash.; Cape Spencer Lighthouse, Alaska; Buffalo Lighthouse, N. Y.; Detroit River Lighthouse, Mich.; Manitou Lighthouse, Mich.; Detour Lighthouse, Mich.; Whitefish Point Lighthouse, Mich.; Devils Island Lighthouse, Wis.; and to replace the more obsolete spark type radio fog signal transmitters on Nantucket Shoals Lightship, Mass., and Cape Henry Lighthouse, Va., and work is actively in progress in connection with these stations. In addition, special equipment has been purchased for the purpose of testing the usefulness of radio fog signals in congested waters, such as Long Island Sound. Progress has been made in work of increasing the efficiency of radio fog signals by synchronizing the signals emitted by adjacent stations by the use of special control clocks, so as to avoid overlapping of signals of neighboring stations. Since October, 1924, the radio fog signal on Nantucket Lightship has been operated for 15 minutes out of every hour, day and night, regardless of weather conditions, thus providing a signal for long-distance bearings in approaching the American coast and also facilitating the testing of apparatus. The number of ships equipped with radio direction-finding apparatus has materially increased, and

favorable reports have been received of the value of this system in safeguarding and facilitating navigation.

Progress was continued in extending the automatic system of operating lighted aids. During the year automatic lighting apparatus was installed at 74 stations. At the end of the fiscal year the total number of automatic lights on fixed structures in commission was 993 (not including some partially automatic), and in addition there were 723 buoys with automatic lights, or a total of 1,716 in the Lighthouse Service. These are operated at greatly reduced cost of maintenance and without loss of efficiency, as compared with lights attended by keepers. In April, 1925, Ram Island Lightship was discontinued and replaced by an automatic buoy using gas for operation of both light and bell. Lake St. Clair Lightship was changed to automatic without a crew in November, 1924. All these changes to automatic apparatus resulted in material reductions in maintenance costs.

At the end of the fiscal year the Lighthouse Service was maintaining a total of 17,864 aids to navigation, a net increase of 581 during the year. Of the total aids 6,351 are lighted and 8,813 are floating. There are 732 aids in Alaska, an increase of 58 during the year.

The most important lighthouse construction in progress during the year was the light-and-fog signal station at Cape Spencer, Alaska, which is now about one-half completed. The construction of a lighthouse at Martin Reef, in the northern part of Lake Huron, was commenced; this will take the place of a lightship. Work was also commenced at an important station on Milwaukee Breakwater, and the construction of the new station at Point Vicente, Calif., was continued. Two vessels are being constructed, a lightship, and a tender for the lower Mississippi River.

Much improvement in the efficiency and morale of the personnel of the Lighthouse Service has resulted from the personnel classification law which has been in operation during the year, and from the act providing for retirement for disability in this service, which was passed in March, 1925.

AIDS TO NAVIGATION

During the fiscal year there was a net increase of 580 in the total number of aids to navigation maintained by the Lighthouse Service. On June 30, 1925, the total number of aids was 17,863.

During the year 72 new aids were established in Alaska and the total number there is now 732.

Improvements in aids to navigation have been made during the year as follows: Forty-three fixed lights were changed to flashing or occulting, the illuminant of 3 lights was changed to incandescent oil vapor, the illuminant of 50 lights (including 2 lightships and 12 lighted buoys) was changed to acetylene, the illuminant of 33 lights (including 4 lightships) was changed to electric incandescent. Two radio fog signals were established. Five gas-operated fog signals were installed at light stations and on buoys. One diaphone and 4 electric sirens were established at important stations, and the fog signals at 7 other important stations and lightships were improved by the installation of more efficient apparatus. Six hundred and ninety-two aids to navigation of various classes stated were discon-

tinued during the year. The discontinuance of further aids is under investigation from time to time as the original necessity for their maintenance ceases.

The lighthouse at Santa Barbara, Calif., including tower, dwelling, and apparatus, was destroyed in the earthquake of June 29, 1925. A temporary acetylene light on a frame tower was put in operation July 3.

ENGINEERING CONSTRUCTION

The more important items of construction completed during the fiscal year, stated in order of districts, were: Riprap protection for various light stations in the second, third, and fifth districts; establishing and improving aids to navigation in Raritan Bay and connected waters, N. Y. and N. J.; riprap protection for west breakwater pierhead lighthouse, Ashtabula Harbor, Ohio, and improving aids to navigation, Conneaut Harbor, Ohio, and Erie Harbor, Pa.; placing a belt of steel plating around the concrete pier at Stannard Rock Lighthouse, Lake Superior, Mich.; establishing 72 aids to navigation in Alaska; and installing an electrically operated fog bell on the jetty at the entrance of Coquille River, Oreg.

Other works in active progress at the close of the fiscal year included the following: The construction of a storehouse with district office quarters and dredging and other improvement at Chelsea Lighthouse Depot, Mass.; improving aids to navigation in the Hudson River, N. Y.; improving aids to navigation, Delaware Bay Entrance; aids to navigation on the eastern shore of Chesapeake Bay and tributaries; establishing a small lighthouse depot at Coinjock Cut, N. C.; establishing aids to navigation, inland waterway, Norfolk, Va., to Beaufort, N. C.; repairing and improving aids and establishing new aids to navigation on coasts of Florida and in approaches to Key West, Fla.; establishing and improving aids in Galveston Bay and Houston Channel, Tex.; preliminary work on a combined dwelling and fog-signal building at Sand Island, Ala.; improving aids to navigation at Fairport Harbor, Ohio, and Sandusky Harbor, Ohio; establishing aids in Detroit River; preliminary work on a light and fog-signal station at Martin Reef, Mich.; improving aids at Calumet Harbor, Ill.; improving aids at Ludington, Mich.; construction of a light and fog signal at Milwaukee Breakwater, Wis.; constructing a light and fog signal at Cape Spencer, Alaska; preliminary work on Grays Harbor Lighthouse, Wash.; and the construction of a light and fog signal at Point Vicente, Calif.

General repairs required for upkeep of aids to navigation in efficient working condition were continued during the year, but the funds available were not sufficient for the proper upkeep of this large amount of public property, and much important repair work was therefore deferred.

IMPROVEMENTS IN APPARATUS AND EQUIPMENT

Work was continued on the installation and use of radio fog signals for protection of navigation in fog. The tube transmitter operating an alternating continuous wave, which was developed with a view to lessening or eliminating the effect of interference and placed in service on Ambrose Lightship April 23, 1924, has been further

improved, and has operated successfully since that date with no complaint of interference.

The extension and improvement of automatic lighting apparatus was continued.

Some improvements were made in the operation of primary electric batteries and small incandescent lamps developed for minor lighted aids.

Improvements have been made in apparatus used in connection with electric illumination of light stations, providing relays in case of failure of bulbs and alarm in case of failure of current, etc.

In certain localities where considerable numbers of minor lights are being maintained, measures are being considered for their conversion where practicable from fixed to flashing by installing automatic apparatus and having them cared for in groups, with a view to increasing efficiency and reducing the cost of maintenance.

A smaller, more efficient mantle has been introduced on oil-gas buoys and beacons in the eleventh district, resulting in important savings in gas and attendance.

Further improvement was made in the design of a gong buoy developed to provide a distinctive buoy sound signal, and this type of buoy is now considered suitable for practical use as needed.

The installation of air fog signals to replace steam signals has been extended with increased economy and efficiency.

There has been further extension in the third district of the substitution of light metal buoys for spar buoys, with satisfactory results; an important advantage in this is the fact that the metal buoys indicate the side of channel by shape as well as by color.

In the past a considerable loss has occurred in the third district due to vessels breaking spar buoys, the breakage being between 150 and 200 buoys per year, mostly first-class buoys. In an attempt to overcome this loss a lot of short, heavy spar buoys have been purchased. They are 35 feet long, 24 to 28 inches diameter at butt, and 18 to 22 inches at top, and are set with piece of chain to make up length. These buoys have been placed on many of the stations bad for breakage, and from experience thus far it appears this type of buoy will decrease the breakage and loss about 75 per cent.

The radio-communication station at Navassa Light Station, West Indies, was transferred by the Navy Department and has been operated by the light keepers since November, 1923, though with some difficulty, owing to lack of special radio training. It is important as the only quick means of communication with this remote station. Recent improvements have been made in the equipment of the station.

The installation of tanks at depots and light stations for the storage of kerosene, which is now being largely purchased locally in bulk, was extended during the year.

A large number of aerial photographs of light stations have been received from the Navy Department and make a valuable addition to the photographic records.

A reconnaissance of Kaula Rock, Hawaiian Islands, was made by means of aerial photographs, taken from an Army airplane, to be used as a preliminary survey for the establishment of a light.

On June 30, 1925, 325 light stations had telephone communication, this being an increase of 3 during the year.

The installation of electricity for lighting of dwellings at light stations was extended.

Improvements in heating plants for light stations have been made, making it possible to use bituminous coal.

Tests have been made with a view to overcoming unsatisfactory service of certain paints in localities subject to great humidity and rainfall.

ADMINISTRATION

The general organization of the service remained unchanged during the fiscal year.

The act of March 4, 1925, amended the Lighthouse Service retirement act of June 20, 1918, so as to provide for retirement on account of disability, with certain restrictions, and under rules to be prescribed by the Secretary of Commerce.

The appropriation act of February 27, 1925, repealed the law providing a ration allowance for keepers of lighthouses, which was payable from the appropriation general expenses. The appropriation for the salaries of light keepers was correspondingly increased and an adjustment of the compensation of keepers was made accordingly. This change is advantageous to the keepers and also simplifies office work.

The act of February 27, 1925, also authorized the purchase of rubber boots, oil skins, etc., for use of personnel while engaged in lighthouse work requiring such equipment. This legislation simply confirmed an existing practice.

The classification act of March 4, 1923, which was made effective for the District of Columbia during the year, has been of great benefit in improving the status and efficiency of the personnel at Washington. Some adjustments in allocations were made and other adjustments are necessary in order to provide equitable treatment for all employees. Adjustments, based so far as practicable on the rates established for the personnel in the District of Columbia, were also made effective July 1, 1924, or later, for certain classes of positions in the field service, in accordance with the act approved December 6, 1924; these adjustments were continued, or further necessary readjustments made for continuance during the present year as provided in the act of January 22, 1925.

An adjustment of the compensation of vessel officers in the Lighthouse Service was made effective July 1, 1924, in order to bring the pay of these positions more nearly on a level with that of similar positions in the United States Shipping Board, the Lake Carriers Association, and other shipping interests.

Some legislation is needed for the Lighthouse Service, including the following more important items: (a) Extension of medical relief now furnished light keepers by the United States Public Health Service, so as to be available for keepers stationed at remote or isolated points; (b) authority for adjustment, within reasonable amounts, of claims of lighthouse employees for loss or damage to personal property caused by storms, collisions, or fire at light stations, depots, or on vessels; (c) increase in subsistence allowance authorized for persons while traveling on official business; (d) to give certain Lighthouse Service employees privileges now

accorded by law to similar services, including the purchase of Army and Navy commissary supplies, transportation for families and household effects when ordered to permanently change station, and transportation, with proper administrative restrictions, on Army transports; (e) some modifications in the retirement provisions affecting this service.

Systematic inspections of the service, both on its technical and its business sides, were continued during the year. The superintendent on general duty made general inspections of stations, vessels, depots, etc., and the examiner made examination of the office business methods and accounts, depot stores and other property, records, etc., in various lighthouse districts. Special inspections were made by the Commissioner and other officers from Washington.

The boundary between the seventh and eighth districts was changed by extending the seventh district to the Suwanee River, for greater convenience in the work.

Various economies in the maintenance of the service have been effected, the more important being the result of further extending the use of automatic apparatus for operating the lights; the replacement of a lightship by a gas buoy and making another lightship automatic and nonattended; the installation of kerosene tanks at light stations and depots and the purchase of illuminating oil locally in bulk by the various districts; the purchase of acetylene cylinders of domestic manufacture at a substantial reduction in cost; and the discontinuance of aids to navigation found to be no longer necessary. The development of improved apparatus and equipment used in the mechanism of aids to navigation and in various operations of the service at depots and in field work has also effected economies.

There has been effective cooperation with other branches of the Government in many ways, and the personnel on vessels and at stations are encouraged to render aid to those in distress.

Cooperation with the school authorities of various States, and more especially Maine, where during the year 43 children at 14 light stations have received instruction, has proven of much value in the matter of providing school facilities for the children of light keepers at isolated light stations.

PERSONNEL

On June 30, 1925, there were 5,961 persons employed in the Lighthouse Service (all authorized employees, including some vacancies). This is a net decrease of 20 during the fiscal year.

The annual report of the United States Employee's Compensation Commission for the fiscal year ended June 30, 1924, gives the number of reported cases of injury subject to compensation for the calendar year 1923 of employees of the Lighthouse Service, sustained while in the performance of duty and resulting in death and disability, as follows: Cases resulting in death, 2; cases resulting in permanent total or partial disability, 7; and of temporary total disability, 132. This number as compared with that of all other branches of the department combined for the period stated indicates

the hazardous nature of the field work of the Lighthouse Service. It is believed that the authorized maximum compensation for disability on account of injury is too low, and that congressional action is desirable to provide a more adequate scale of compensation for employees who have lost their earning power because of disability through injury sustained while in the performance of duty.

The Lighthouse Service retirement act of June 20, 1918, was amended so as to provide for retirement on account of disability. This provision of law has already been applied to a few serious and meritorious cases, and will be of great benefit to the personnel and in promoting the efficiency of the Lighthouse Service.

The classification act has been of great value in increasing the efficiency of the Lighthouse Service.

Incidental to the regular work of the service many opportunities arise for rendering aid to those in distress because of the location of the light stations and vessels. During the fiscal year upwards of 95 instances were reported of saving life and property or rendering valuable aid, often at a great risk to the lighthouse employee. Many of these acts were especially meritorious, and the employees were individually commended by the Secretary of Commerce. Silver life-saving medals were awarded in August, 1925, by the Secretary of the Treasury, as provided under congressional authority, to two employees of the Lighthouse Service for gallant conduct in saving human life. One of these medals was awarded to Charles A. Sterling, keeper of Craney Island Light Station, who on July 26, 1924, assisted in rescuing the passengers on the steamer *Gratitude*, which sank immediately after the rescue; and the other to Everett Wynoble, oiler on the lighthouse tender *Hyacinth*, who jumped overboard in the Chicago River and rescued a drowning woman on April 14, 1925.

COST-KEEPING SYSTEM AND RESULTS

A cost-keeping system has been continued in effect throughout the fiscal year. The costs are based on the actual expenditures for the various features during the fiscal year, including direct purchases and articles issued from stock. A stock record also is maintained. This cost-keeping system is useful in furnishing information as to the disposition of all appropriations for this service, in preparing estimates, planning work, effecting economies, and comparing the efficiency of different districts, vessels, light stations, apparatus, methods, etc.

LIGHTHOUSE DEPOTS

The lighthouse depots are a very essential feature of the efficient conduct of the work of the Lighthouse Service; they are the supply, repair, and vessel headquarters for the various districts. The depots are generally well distributed along the coasts of the country, but several of them are not adequate for the work or are not suitably located.

At the depot at Chelsea, Mass., the construction of a three-story steel frame, brick, and concrete storehouse, having quarters for the district office, and including the installation of a heating plant, was practically completed.

During the year additional space adjoining the important depot at Portsmouth, Va., was purchased in order to permit extension of the wharves and buildings, and it is proposed to proceed with the work of construction as soon as the necessary approval of deed, etc., has been obtained.

Provision is also needed for improved depot facilities in several other districts, particularly at or near Newport, R. I.; Key West, Fla.; Honolulu, Hawaii; Goat Island, Calif.; and New Orleans, La. Other work needed consists of dredging at the entrance to Woods Hole Depot, Mass., and Tongue Point Depot, Oreg.; rebuilding the wharves and storehouses at the Edgemoor Lighthouse Depot; and completing improvements to wharves and providing additional storage buildings at the General Depot, Staten Island, N. Y. Additional funds are needed for the completion of the important depots at Charleston, S. C., and Ketchikan, Alaska. There is also needed in the future a better located depot in the first district at Portland; and a depot at Rockland, Me.

The storehouse at the Edgemoor Lighthouse Depot, Del., with stock of supplies, materials and equipment, was destroyed by fire on April 28, 1925. Measures have been taken for the erection of a temporary storehouse for use until funds for a permanent storehouse are available.

A small depot was established at Coinjock Cut, N. C., to take the place of the one at Long Point, which was discontinued on account of the dismantling of the oil gas plant at that point.

VESSELS OF THE LIGHTHOUSE SERVICE

REPLACEMENT OF VESSELS

Little progress was made during the year in the replacement of old and worn-out vessels, as noted under tenders and lightships; due to lack of sufficient funds much needed work of replacement and reconditioning of vessels has had to be postponed.

From careful estimates and examinations as to the conditions and further serviceability of vessels of the Lighthouse Service, it is found that in addition to those recently completed and reconditioned and the vessels now building, 11 lightships and 4 tenders should be replaced or built and 4 other tenders reconditioned within the next five years. As it will require from two to three years after appropriation is made before vessels are available for service, funds should be provided now for 4 new lightships, in addition to the provision for vessels made in the act of February 27, 1925.

Requests have been received for the provision of a relief lightship for the Gulf coast, and for the establishment of lightships off St. Johns River, Fla., and Southwest Pass, Mississippi River, La.

LIGHTHOUSE TENDERS

The lighthouse tenders during the year have steamed a total of 473,759 nautical miles, or an average of approximately 8,773 miles for each tender, in the work of maintaining buoys, carrying supplies and construction materials to stations, supplying lightships

with coal, water, etc., also transporting officers and employees to stations or on inspection duty, as well as duty in cooperating with other Government services, and the saving of life and property when occasion required. The total quantity of fuel consumed by tenders during the year was 53,503 tons of coal, 31,315 gallons of gasoline, 4,625 gallons of kerosene, and 2,307,205 gallons of fuel oil. The total cost of maintenance of tenders during the year amounted to \$2,275,061, exclusive of the cost of repairs, which amounted to \$324,292.

The reconditioning of the tender *Woodbine*, converting its machinery from gasoline to steam propulsion, and the reconstruction of the deck house, quarters, etc., has been completed.

The construction of a tender for the lower Mississippi River is well under way. Five tenders were equipped with radiocompasses during the year, and at the end of the year there were 11 tenders equipped with radiocompasses and 30 tenders equipped with radiotelegraph.

The boilers of the tender *Sequoia* have been converted from coal to oil burners during the year. This improvement has increased the cruising distance of the vessel without refueling, permitted reduction of the personnel, and will, it is expected, result in other economies of operation. Similar change is planned for the tender *Kukui* during the present year, and also for other tenders as soon as funds permit.

LIGHTSHIPS

The Lighthouse Service maintains lightships on 46 stations. During the fiscal year 59 vessels were in commission, of which 12 were relief lightships, and they averaged 262 days on station per vessel. The total cost of maintenance of lightships during the year was \$1,090,490, exclusive of repairs, which were \$120,005. Many of these lightships have passed the age of useful service, and some of them are in such condition as to be not worth the cost of repairs. Of the present lightships 42 have self-propelling machinery, and 16 are provided with sail power only. One has no means of propulsion.

The completion of new lightship *No. 111* has been under way at the general depot at Staten Island.

Radio communicating apparatus was maintained on 23 stations and 8 relief vessels during the fiscal year. Sixteen lightships are equipped with radio fog-signal apparatus.

Lightship *No. 75*, on Lake St. Clair, was equipped with an automatic gas-operated fog bell, and placed on station as an unattended lightship, without crew, at a material saving, November 22, 1924. This is the first unattended lightship in this service.

Ram Island Reef Lightship was discontinued April 4, 1925, and replaced by an automatic gas and bell buoy, effecting a large annual saving.

Very truly yours,

GEORGE R. PUTNAM,
Commissioner of Lighthouses.

COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE,
COAST AND GEODETIC SURVEY,
Washington, July 1, 1925.

HON. HERBERT HOOVER,
Secretary of Commerce.

DEAR MR. SECRETARY: In response to your request I furnish the following condensed report upon the work of the bureau during the past year:

HYDROGRAPHIC AND TOPOGRAPHIC SURVEYS

Many of the surveys accomplished during the year were requested by other Government departments, including detailed surveys of a section of the District of Columbia, and surveys in the Hawaiian and Phillipine Islands and in Alaska.

ATLANTIC AND GULF COASTS

Detailed inshore hydrographic and topographic resurveys were made along the Atlantic coast, extending from St. Augustine, Fla., to the Savannah River. These surveys included detailed work at the entrance to the numerous bays and sounds along this stretch of coast; the results show that marked changes have occurred since the last survey was executed. Offshore hydrographic work, extending from the beach to the 100-fathom contour, and a topographic survey of the shore line were carried on in the vicinity of Cape Fear River, N. C., during the summer and fall of 1924. During the winter and spring of 1925 similar work was executed along the coast of Florida in the vicinity of Ormond.

A survey of Lake Okeechobee, Fla., was completed this winter. The triangulation had been established during the previous year. The topography executed in the field consisted only of the determination of enough points for the necessary control to transfer detail from aerial photographs taken by the Bureau of Aeronautics, Navy Department.

Resurveys of Baltimore Harbor, Scituate Harbor, Fire Island Inlet, and Beach Haven Inlet were completed during the fiscal year.

A resurvey of Tampa Bay and approaches was in progress during the year.

PACIFIC COAST

One vessel was continuously employed during the winter months, working northward along the southern coast of California. This survey extended from the beach to the 1,000-fathom contour. During the summer this vessel executed a similar survey in the vicinity of Cape Blanco, Oreg.

In addition, two vessels employed during the summer in Alaska were assigned survey duties during the winter months, one working on the southern coast of California and the other on inshore and offshore hydrography in the vicinity of Monterey Bay.

A wire-drag examination was made of the naval anchorage, San Francisco Bay. The southern channel of the entrance to the bay was resurveyed.

Detached parties made a resurvey of the bar at the entrance to Willapa Bay and Quillayute River.

En route to Alaska one of the survey vessels made an examination for a reported rock in the vicinity of Point Wilson, Puget Sound. A wire-drag examination of the entrance to Drayton Harbor was also made.

ALASKA

During the summer months, when survey operations can be economically carried on in the Territory, two vessels have been employed in southeastern Alaska and two in western Alaska. Another small vessel was added to the fleet in southeastern Alaska during the latter part of the fiscal year.

The project of surveying the outside coast of Alaska, from the boundary line north, has been continued along the coasts of Baranof and Chichagof Islands. The present charts of most of this locality are based upon notes and sketches of early Russian and British explorers.

Wire-drag examinations of Kasaan, Thomas, and Gambier Bays, and of Twelve-Mile-Arm were completed. Surveys of Cold, Pavlof, Jute, and Chignik Bays, and of the approaches to Wide and Portage Bays were also completed. A partial survey of Isanotski Straits was made.

OUTLYING POSSESSIONS

A hydrographic and wire-drag survey of the Virgin Islands was continued during the entire fiscal year. It became necessary to withdraw the vessel engaged on this work for extensive repairs during part of the year. During its absence from the field of work the survey was carried on by a detached party operating the three launches which are used in connection with the vessel.

In the Hawaiian Islands one officer has been employed continuously on special surveys for military purposes. Another officer with a small detached party was employed for a period of three months in making detailed surveys of different harbors in the islands.

The work of the survey has been carried on in the Philippine Islands by three vessels. The expense of this survey is largely borne by the insular government. Two of these vessels have been employed in surveys in the Sulu Archipelago. The third vessel was employed during part of the year in executing surveys along the northern coast of Luzon and in locating the many islands north of Luzon belonging to the United States. When work in this locality was prevented by the monsoon, a resurvey of Cebu Harbor and of a small bay on the west coast of Negros Island was accomplished.

WORK IN PROGRESS AT THE END OF THE FISCAL YEAR

On the Atlantic and Gulf coasts, at the end of the fiscal year, one vessel was employed in offshore surveys south of Chesapeake Bay and another in similar work south of the Cape Fear River. A launch party was ready to take up inshore surveys along the coast of South Carolina. A vessel was continuing the resurveys of Tampa Bay and approaches.

On the Pacific coast one vessel was engaged in offshore hydrography in the vicinity of Cape Blanco, Oreg.

In Alaska the continuation of the offshore surveys in southeastern Alaska was in progress as well as wire-drag operations in Chatham Straits and surveys of Kaigana Straits. The survey of the inside passages east of Ikatan Bay and the eastward extension of the survey of Chignik Bay were in progress.

In the Virgin Islands one vessel was engaged in the continuation of hydrographic and wire-drag work.

In the Hawaiian Islands one party was engaged in detailed hydrographic and topographic work.

In the Philippine Islands two vessels continued survey work in the Sulu Archipelago. A third continued on surveys north of the Island of Luzon.

IMPORTANCE OF INSTRUMENT WORK

The bureau maintains a small force for repairing its instrumental equipment and devising and constructing new apparatus. This force is a most important adjunct to the field operations, as it is essential that the necessary equipment be in readiness and in proper working condition before a party takes the field. Any delay is extremely expensive after a party is organized and under way.

Most of the bureau's highly accurate and special instruments have been designed and built in the Washington office, as no private organization is fitted to perform this work. Many of these instruments were copied or adopted outright by other governments and by private parties. A number of colleges and universities are making use of Coast Survey model instruments in their courses of instruction and are annually sending their undergraduate civil engineers to this office to inspect our apparatus and procedure.

A rapidly increasing number of municipalities are undertaking precision surveys. Frequent calls come from these communities for advice or for the loan of instrumental equipment.

The instrument division is performing a distinct public service in itself, both in research and in the development of precise surveying equipment.

Wherever possible the bureau also cooperates with private concerns in the development of new apparatus suitable to its needs. The bureau is now working with a commercial firm on the design of an apparatus for determining ocean depths by the sound-echo method. One such apparatus is now being tested on a survey vessel.

During the past year a machine was designed and built by the instrument division for engraving sounding depths on negatives used in the photolithographic process of chart printing. This ma-

chine is also adapted to engrave on copper plates used for the same purpose, and is smaller and less expensive than the machines used heretofore. Incidentally, the bureau saved a considerable sum by building this machine itself, as its total cost was but \$965.58 as compared with the price of \$5,500 quoted by a commercial company for a machine to do similar work.

A number of improvements were made in the portable automatic tide gauge developed by the survey, making it more reliable in operation and easier to install. Another machine, which applies the graduations to geodetic level rods, was completed during the year. This work is now done more rapidly and accurately than is possible by hand methods and is less fatiguing to the operator.

Various improvements were made in the instruments used in hydrographic, magnetic, and geodetic work, which render them more efficient and less expensive. Additional instrument makers are sorely needed as a matter of economy as well as to take care of additional demands.

GEODETIC WORK ACCOMPLISHED

The products of geodetic surveys which are of especial interest to the general public are the positions of marked points on the earth's surface, in terms of latitude and longitude, and the elevations of the bench marks established by leveling. Other geodetic operations, such as base measurements and observations for astronomic longitude and azimuth, are conducted for the purpose of obtaining data necessary to compute the triangulation and traverse. Geodetic surveys are often called control surveys for the reason that the points so established are used to locate detailed surveys in their proper relative positions on the earth's surface and in elevation above mean sea level.

Good progress was made with the Geodetic Survey of Canada on the two great cooperative projects which have been in progress for several seasons. Both are arcs of triangulation which will greatly benefit both countries, the first extending from Lake Superior to the Pacific, and the other from Puget Sound through British Columbia and southeastern Alaska to Skagway. It is expected that in another year the field work will be completed on both projects.

The preliminary system of triangulation control west of the ninety-eighth meridian probably will be completed next year. This meridian is marked roughly by Fargo, Oklahoma City, and San Antonio. The preliminary system consists of belts of triangulation crossing each other in checkerboard fashion, the squares of the checkerboard being 300 or 400 miles on a side.

As a part of this general system one belt of triangulation was completed last winter, from San Antonio westward to the Rio Grande, and two others were in progress at the end of the year. The first of these extends from Sioux Falls, S. Dak., westward through South Dakota and Wyoming to Bozeman, Mont. The second lies in Utah and Nevada, between Salt Lake City and Needles, Calif.

In western Alaska observations along the arc of first order triangulation from Cook Inlet to Fairbanks progressed past the Broad Pass region and reached almost to the Tanana Valley. The funds available did not permit observing to be resumed in the spring of 1925. However, reconnaissance was begun to select stations along

the continuation of the triangulation scheme past Fairbanks and up the Tanana and Goodpaster Rivers to Eagle, where it will connect to the first order triangulation brought up from Puget Sound past Skagway.

In southeastern Alaska first order triangulation was thrown across Dixon Entrance, connecting with the Canadian triangulation to the south. Bases were measured along the whole southeastern Alaska arc as far as the head of Lynn Canal near Skagway.

Under a special appropriation item, work was continued in California on the investigations relating to changes in position and elevation of the earth's surface in regions subject to earthquakes. Triangulation established many years ago from the Santa Barbara Channel southeastward across the Imperial Valley was reobserved and a line of levels was rerun from Santa Ana to Barstow, Calif., which crosses many geologic faults. These investigations were conducted in accordance with the program suggested by the Committee on Seismology of the Carnegie Institution of Washington. The Carnegie Institution also cooperated with the Coast and Geodetic Survey by paying the field expenses of a party engaged in connecting, by triangulation, the international latitude observatory at Ukiah, Calif., with the revised triangulation in the vicinity of Sacramento.

One astronomical party was in the field during the greater part of the year and some leveling also was done but in general the activities of the geodetic parties were concentrated on triangulation.

The officials of this bureau continue to commend in highest terms the aid which has been rendered them by the United States Naval Observatory, the Bureau of Standards, the Forest Service, the Alaska Road Commission, and other Government bureaus.

TEMPLE ACT SURVEYS

Under the provisions of the Temple Act, the President is authorized to complete the standard topographic map of the country within 20 years. This measure, sponsored by the engineering interests of the nation, places upon the Coast and Geodetic Survey the responsibility of executing the first and second order triangulation, traverse and leveling, sufficiently in advance of the topographers to provide them with the necessary positions and elevations. The control surveys to be made under this act will be planned in cooperation with the Geological Survey.

The inauguration of work under this act will mark a new era in our national surveys for it will render possible a systematic planning of work from year to year which was not possible under the old system and which will also result in considerable reductions of unit costs.

REDUCTION OF FIELD RECORDS

The mathematical processes for adjusting the intersecting arcs of triangulation and traverse to prevent large accumulations of errors have been considerably simplified in recent years, but the reduction of the field observations to a tabulation of latitudes, longitudes, and elevations convenient for the use of the engineer still requires considerable time.

On triangulation the cost of the office work per point determined averages between 5 and 10 per cent of the cost of the field work while

on traverse the cost per point for the office work is from 15 to 20 per cent that of the field work.

It is very expensive, both to the Government and to the public, to delay publishing control survey data. A single photostat copy of manuscript data furnished an outside engineer will cost him as much as a pamphlet containing the control data for an entire State. In addition, searching the files for these data is rapidly making serious inroads upon the time of the geodetic personnel. During the year covered by this report about 20 per cent of the time of the entire division was taken up in collecting and furnishing data requested. The cost to the Government is still more marked when photostat copies of data must be furnished other departments, often in large quantities. The force of geodetic mathematicians is not adequate to prepare the results for publication as rapidly as economy demands.

MAGNETIC AND SEISMOLOGICAL WORK

Four magnetic observatories located at Tucson, Ariz.; Cheltenham, Md.; Sitka, Alaska; and near Honolulu, Hawaii, have been in operation and have secured continuous records of the magnetic elements and earthquakes. The magnetic records have been used to reduce the field results to standard values and have furnished material needed in the study of terrestrial magnetism. The earthquake records have been used in studying a number of important earthquakes which have occurred during the year.

The fifth observatory, that at Vieques, P. R., discontinued operation on November 1, 1924. A site on the main island of Porto Rico was furnished by the city of San Juan, and at the close of the year necessary buildings were in the process of erection.

The field magnetic work has been primarily resurvey work. It has included both the occupation of repeat stations to determine the change in the magnetic elements, and inspection and replacement of defective magnetic stations for the use of local surveyors in standardizing their compasses. Repeat work has been carried on in the Middle Atlantic States, New England, the West Central and Northwest States. Replacement of stations was carried on chiefly in Texas and North Carolina, in the latter case with the cooperation of the State. There is now a usable station at every county seat in North Carolina and the information has been made available in a publication.

A canvass of county surveyors, started in 1924, was continued throughout the year, so that the bureau is now in correspondence with more than 2,300 county surveyors, an increase of 300 during the year, and has received reports on the state of preservation of 43 per cent of its approximately 3,750 magnetic stations, an increase of 10 per cent during the year. The demand for magnetic information from a great number of local surveyors has been clearly brought out, and the bureau is now publishing its results by States in order to meet this need.

Repeat stations were occupied in the Hawaiian Islands. With the cooperation of the Philippine Insular Government repeat stations and also a number of new stations were occupied throughout the Philippine Islands.

There is a most urgent need for increasing the office force of the division of terrestrial magnetism and seismology. Improved meth-

ods have resulted in a greater output of work from the force available, but there has been no increase of personnel for years, and the increased demand on the part of the public has made it extremely difficult to meet the demands made upon the division with its present personnel.

MAGNETIC SURVEY OF ALASKA

During the year magnetic declination was determined at a large number of triangulation stations in southeastern and western Alaska. As a result, correct magnetic information can be placed on the charts of the regions which are being surveyed. There is need for magnetic work in many parts of this great area. Magnetic stations are now found only along the main lines of travel, and there are vast areas where no observations have been made. At the present time a party making a survey of the Aleutian Islands, in cooperation with the Coast Guard, is including magnetic observations in its program. It is planned to do repeat work in the interior during the next fiscal year.

The magnetic observatory at Sitka, with its continuous record of magnetic declination, dip, and intensity, is of special importance, in view of the scarcity of observations elsewhere. This observatory is well situated for the study of magnetic storms which are often accompanied by auroral displays and are sometimes of such intensity as to cause difficulties in cable transmission and operation of radio stations. The records of the Sitka Observatory are used in these studies.

SEISMOLOGY

During the year the duty of making seismological investigations was placed on this bureau by an act of Congress. The need for the work was emphasized by four important earthquakes in regions in or adjoining the United States (St. Lawrence Valley, Alaska, Montana, and California). The subject accordingly has been given more consideration than at any time since 1906. The bureau is still carrying on the work as an accessory to magnetic work, on account of lack of funds, and accordingly is having difficulty in meeting the great demand for information. Its tentative program includes a study of earthquakes as a basis for meeting the problem of earthquake insurance, which includes the preparation of earthquake maps of the country; similar information about earthquake regions where precaution in building is necessary; recording of earthquakes, including the installation of better seismographs and scientific study of the records. The scientific study is so intimately associated with the obtaining of practical results that a distinction can hardly be made. The immediate intention is to place better instruments at the magnetic observatories and spend more time in the study of records. The collection of felt and visible effects of earthquakes has been and will continue to be an important function.

TIDE AND CURRENT OBSERVATIONS

In addition to numerous short series of tide observations the regular tide observations at primary tide stations were continued during the year. Eight stations were maintained on the Atlantic coast,

four on the Gulf coast, six on the Pacific coast, two in Alaska, and one in the Hawaiian Islands. A comprehensive current and tide survey of Delaware Bay and tributaries was made in the fall of 1924. With the cooperation of the Bureau of Lighthouses, current observations were made on two light vessels stationed along the Atlantic coast and one on the Pacific coast.

THE DELAWARE BAY CURRENT AND TIDAL SURVEY

A large part of the annual appropriation for tide and current work is used for the purpose of comprehensive current and tide surveys of our principal harbors. In the fiscal year 1923 such a survey was made of New York Harbor, in 1924 of San Francisco Harbor, and in 1925 of Delaware Bay and tributaries. Definite information relating to the tide and current phenomena for those harbors is now available. To the navigator the Current Tables, based on these surveys, are of invaluable assistance, since they inform him in advance of the times of slack water and the time and velocity of the current—the first of importance in berthing large vessels, and the second in keeping account of position of vessel in thick weather. Aside from the value of these data for purposes of navigation, the by-products obtained at no increased cost, are of considerable value to the engineer engaged in harbor development and marine construction of various kinds, such data being necessary to a proper understanding of the conditions under which operations will be carried on, as well of of the physical conditions which will result from an engineering project.

The data from the survey of New York harbor appear in Coast and Geodetic Survey Special Publication No. 111. The manuscript of a similar publication for San Francisco Harbor is now in press. The data from the Delaware Bay Survey are now being computed and after being correlated with the various scattered observations made at different times in previous years will be forwarded to the printer toward the end of the next fiscal year.

CURRENT SURVEY, SOUTHEASTERN ALASKA

While other important harbors await current surveys it was thought advisable for the next fiscal year to make current observations in the narrow passes of southeast Alaska from Dixon Entrance to Cross Sound. Data from such observations are urgently needed in order to increase the accuracy of the predictions in our Pacific Coast Current Tables, which are at present based on meager data in many cases. The strong velocity of the currents and the short duration of slack water in these passes make accurate predictions extremely desirable.

INVESTIGATION OF GULF STREAM

The funds available for tide and current work do not permit of extensive observations in physical oceanography. Little has been done in this field except in a general way and that of a reconnaissance nature. A study of the Gulf stream is of considerable value and may be considered as one of the most important matters in oceanography. Considerable reconnaissance work was done for a num-

ber of years by this bureau in this important field, but lack of funds has prevented any further work. Systematic current and other oceanographic observations should now be carried on by the survey in this oceanic river as one of our vessels becomes available and our appropriations sufficiently increased to cover the cost charged against party expense, tides, etc.

COOPERATION WITH OTHER AGENCIES IN TIDE AND CURRENT WORK

The cooperative arrangement has continued with the Hydrographic Department of the British Admiralty whereby the manuscript of predictions for American ports is exchanged for predictions of English ports. This arrangement began with the exchange of 6 ports and has since been extended from year to year to a present exchange of 16 ports from each organization.

During the year numerous requests have been received from various organizations and individuals for information as to costs and manufacturers of the portable automatic tide gauge recently developed by the Coast and Geodetic Survey. They were furnished descriptions of the instrument, its cost, and names of manufacturers. The special publication, now in press, descriptive of this gauge for the use of our officers in installation and maintenance, will serve a useful purpose also for outside engineers.

For use on the oceanographic cruise to the Sargasso Sea and southern islands, this bureau loaned a portable automatic tide gauge, current meters, and other oceanographic instruments to Dr. William Beebe, of the New York Zoological Park. Doctor Beebe will turn over to the bureau the records obtained from the use of these instruments.

Because Seymour Narrows lies in British Columbia waters, this survey has had no data upon which to make accurate predictions of the currents, which are of considerable importance to vessels on the Seattle-Alaska run. The Canadian Tidal and Current Survey, at the request of this bureau, furnished us with three months of observations made by them in the summer of 1923 at each end of the Narrows. These observations were analyzed and the constants used on the tide-predicting machine for the predictions of slacks and velocities in the Narrows. The results appear in the 1926 current tables. Before making use of these data for the current tables the slacks for the year 1910 were predicted and checked against actual observations of slacks made that year. The predictions agreed with the actual observed slacks within less than 15 minutes 67 per cent of the time, and within a half hour 92 per cent of the time.

The bureau is cooperating with the State of New Jersey in the study of apparent tide fluctuations in an 800-foot well at Longport. The study is being made in connection with an investigation of the water supply of Atlantic City.

DIVISION OF ACCOUNTS

From July 1, 1924, to June 30, 1925, the actual disbursements on account of appropriations for the Coast and Geodetic Survey amounted to \$2,133,718.02. It must be understood, however, that this does not represent the actual expenses of the survey for the

fiscal year 1925, but only the actual disbursements. In a separate report to Congress will be found an itemized statement showing disbursements from each appropriation and subitems thereof with all detailed information as to the character of the expenditure.

These expenditures include the accounts of all chiefs of parties in the field located throughout the United States, Alaska, Hawaii, Porto Rico, the Philippines, and the Virgin Islands. From 30 to 50 chiefs of parties were engaged on field duty at various times during the year, being financed through advances made to them by this division, and accounts arising under such advances were submitted to and through this division to the Treasury Department.

The total appropriations for the fiscal year 1925 were \$2,327,650.

CHARTS AND PUBLICATIONS

During the fiscal year the survey continued its task of furnishing to other branches of the Government and to the maritime public correct and up-to-date charts. It also made gratifying progress in the production of new charts resulting from the recent completion of surveys by our field parties or from the policy of replacing certain existing charts with others conforming to present-day standards.

The issue of charts shows a gratifying increase. The number of charts actually sold to the public increased 8 per cent over 1924. The issue of charts is the principal factor with which to measure the bureau's service to the public.

As explained in previous reports, however, the number of charts issued does not afford an accurate measure of the task incident to their production. The true measure is obtained by consideration of the amount of data received in the office to be used in the construction or correction of charts. In this respect also the year has been a gratifying one, having been the biggest and most productive one in the survey's history. As a result of conscientious effort by each section, new information, in spite of the increase in its amount and with no increase in personnel to handle it, has been given to the public more promptly than at any previous time.

For many years a sounding engraving machine has been used for cutting the soundings into copper plate. Experiments with this machine showed that a similar one could be used, with a considerable saving of time, for cutting soundings through the film on the glass negatives used in the photolithographic process.

The Coast and Geodetic Survey was created primarily to produce one specific product for public use, and the production of that product still constitutes its principal function. The survey's value to the public is influenced, therefore, by the extent to which the latter has knowledge of the availability of that product and of its general character. Having this fact in mind, this bureau during the past year has continued its efforts to acquaint the public with our charts and to make it easier for the public to obtain them as well as to improve the quality of the product itself.

Posters advertising the publications in general, as well as a special poster descriptive of the new series of inside route charts from Norfolk to Key West, have been distributed for display by agents, yacht clubs, and at other places where they will reach the eye of the mari-

time public. These posters were prepared within the bureau, at nominal cost, which is amply justified by their usefulness. Large-scale charts of local interest have been displayed in post offices, custom-houses, and yacht clubs at various places.

Unusual efforts have been made, both by letter and by personal visits, to improve the quality of service rendered by our agents. Particular pains have been taken to see that each agent carries a stock of charts adequate to meet any reasonable demand made upon him, yet at the same time to insure such a selection of charts that the periodic condemnation will not be excessive.

LEGISLATION NEEDED

The Coast and Geodetic Survey is severely handicapped at headquarters in that its office buildings are old and unsuitable for the most efficient work, and consequently the fullest benefit is not being received from the funds appropriated for the bureau. Maximum accomplishments can not be expected without legislation. The arrangement of these offices in eight different buildings, not all contiguous, causes a loss of efficiency in the production of nautical charts and in the manufacture and repair of the instruments necessary for surveys. Not only is the cost of production greater, but less headway is being made for the reason that we are using extra labor to accomplish work which should be done mechanically. Copper printing plates are now being carried by laborers from a store-room to the engravers five flights of stairs above. An elevator should be installed to facilitate this work. In this way the delivery of plates would be speeded up, the time of skilled artisans would be used most advantageously, and the amount of extra labor would be materially reduced.

This is not the only instance of the kind. In the manufacture and repair of instruments and equipment there is often a similar loss of efficiency which could be obviated by minor alterations to the buildings. I therefore urge that legislation be enacted authorizing such minor improvements as are found necessary. I am including in the estimates for 1927 an item which will permit the replacement of manual labor by mechanical equipment and otherwise provide better facilities for carrying on the industrial work of the bureau. This legislation requires no additional appropriation.

ADDITIONAL VESSELS

Emphasis is again placed on the urgent need of this bureau for additional floating equipment. Three tenders for the three larger vessels are most urgently needed to replace similar craft which have been worn out in service. One of these gave out several years ago; the second one was discontinued this year and ordered to be sold as junk; the third tender is still in operation but is in a decidedly decrepit condition and probably will not last another year. A small vessel of about 500 tons displacement is urgently needed for duty on the Atlantic coast to replace two small vessels which have outlived their usefulness and are weak, inefficient, and costly to maintain.

SANITATION OF BUILDINGS

I am gratified to report that a recent sanitary inspection of the buildings occupied by this bureau brought forth official commendation by the inspecting agent, a goal toward which we have turned our efforts for a number of years. This has been a most difficult task and reflects special commendation on those charged directly with care of the buildings as well as those who occupy them in their help to maintain an unusually high standard of order and cleanliness. Only one of the eight buildings was erected for the specific use of the bureau. Two were constructed for private dwellings and a third for a stable; two others, somewhat adjacent, were intended for hotel use. As a result of this unique combination, and being next to the United States Capitol and opposite the House of Representatives Office Building, our quarters are most difficult and expensive to maintain in proper order without unusual efforts.

Ten years ago the calcimined walls were scaling badly and the floors and woodwork were extremely dirty. Naturally the inspection reports were filled with unfavorable criticisms. Now, however, by an exercise of daily diligence on the part of our personnel, these defects have been corrected so that all of the buildings are as clean and inviting as is possible without an extraordinary expenditure of funds.

Very truly yours,

E. LESTER JONES,
Director, Coast and Geodetic Survey.

BUREAU OF NAVIGATION

DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, July 1, 1925.

HON. HERBERT HOOVER,
Secretary of Commerce.

DEAR MR. SECRETARY: In response to your request I furnish the following condensed report of the work of the bureau during the past year:

American shipping registered for the foreign trade and enrolled and licensed for the coasting trade, including the fisheries, on June 30, 1925, comprised 26,367 vessels of 17,405,902 gross tons, compared with 26,575 vessels of 17,740,557 gross tons on June 30, 1924, a decrease of 208 vessels of 334,655 gross tons.

Lloyd's Register of Shipping gives the total seagoing steel and iron steamers and motor vessels owned by the principal maritime countries on June 30, 1925, as 61,317,341 gross tons, of which Great Britain and Dominions have 21,758,962 gross tons and the United States is second with 11,550,533 gross tons, excluding the Great Lakes.

Of the total world seagoing tonnage, amounting to 32,916 vessels of 64,641,418 gross tons, 894 Shipping Board vessels of 3,777,155 gross tons and 254 privately owned American vessels of 547,286 gross tons were laid up on June 30, 1925.

On January 1, 1925, according to the Chamber of Shipping of the United Kingdom, there were laid up at the principal ports of the United Kingdom 319 ships of 751,921 gross tons, as against 301 ships of 968,936 gross tons on January 1, 1924.

Following is a brief analysis of our shipping on June 30, 1917, as the United States entered the war, and at the close of the fiscal year 1924 and on June 30, 1925:

June 30—	Grand total		Seagoing				Great Lakes		All others	
			Shipping Board (over 1,000 gross tons)		Private owners (over 500 gross tons)					
	Number	Gross tons	Number	Gross tons	Number	Gross tons	Number	Gross tons	Number	Gross tons
1925.....	26,367	17,405,902	1,218	5,839,659	1,925	6,216,552	2,677	2,855,019	20,447	2,494,672
1924.....	26,575	17,740,557	1,339	6,290,323	1,983	6,244,555	2,693	2,791,204	20,560	2,414,475
1917.....	26,397	8,871,037	19	76,160	1,552	3,564,160	3,001	2,779,087	21,825	2,451,630

On June 30, 1925, there were building in American shipyards, including the Great Lakes, 187 vessels of 185,654 gross tons, as compared with 222 vessels of 185,077 gross tons on June 30, 1924.

NAVIGATION LAWS

Under section 4 of the act of July 5, 1884, the Commissioner of Navigation is directed to investigate the operation of the law relative to navigation and annually report to you such particulars as may admit of improvement or may require amendment.

LOAD LINE

In the report for 1924 the report of the committee appointed by you to consider Senate bill 1319, Sixty-eighth Congress, first session, was set forth at length. It is generally accepted that legislation on this subject is essential, first, in the interest of safety and, second, to improve the commercial standing of our great fleet of ocean-going cargo steamers. The Senate bill referred to, if amended as suggested by your committee meets the more serious objections which have heretofore delayed legislation on this subject. This legislation should be approved, first, in consideration of the safety of the vessel and crew and the avoidance of the damage and extensive repairs inevitable with inadequate freeboard, and second, because the leading maritime nations all have different load-line provisions, and their laws require our ships loading in their ports to comply with their several detailed requirements in the absence of similar regulations of our own. The United States is now the only maritime nation of importance whose commerce is liable to be hampered by these provisions.

REORGANIZATION OF MARITIME BUREAUS AND ACTIVITIES

A constructive reorganization of the whole relation of the Federal Government to the merchant marine in all of its administrative aspects is most urgent. Such reorganization should be made to assure better administration, prevent duplication, insure and define administrative responsibilities, and provide an expert and efficient organization with resulting benefits to the merchant marine.

Among the several services involved in the proposed centralization of marine activities is the transfer from the Treasury Department to the Department of Commerce of the personnel now in the custom-houses employed exclusively on navigation work. These employees are under the jurisdiction of and receive their instructions direct from the Department of Commerce, but are appointed, paid by, and are under the administrative supervision of Treasury officers. The Bureau of Navigation performs nearly all of its functions through these employees of the Treasury, the organization being created on customs rather than navigation lines.

Perhaps the most pressing need is the transfer to the Department of Commerce of the admeasuring officers now in the Treasury Department. The present awkward and unbusinesslike system necessarily results in American admeasurement being below the standard of other maritime nations, which results in discriminations against our vessels, delay in performing the work and unnecessary cost.

The only means the bureau has for securing uniformity and accuracy in the admeasurement of vessels is through one traveling adjuster who visits the various ports and confers with and instructs

the admeasurers, but who is able to make the complete circuit only once in two years. In the meantime there are changes of admeasurers at many of the ports. The results are not satisfactory even at ports where large vessels are measured, and experienced men give practically all of their time to the work.

Centralization of the personnel will improve the service. It will engender professional pride, consolidate efforts, and secure more responsive action; all of which would attract competent men and through central direction render expert and adequate service to the credit of the department and benefit to shipowners. Such service would be standard and expert advice would be available in the construction of vessels on points of law regarding tonnage, saving delay and expense entailed in changes later found necessary to secure the benefits of deductions and exemptions. The Panama Canal authorities have expressed the view that such service should be instituted as soon as practicable as the variation in methods of admeasurement at our various ports is reflected in the work at the Canal.

RADIO SERVICE

Radio has probably grown more rapidly than any other industry within the same period of time. It has been estimated that sales have increased from approximately \$2,000,000 in 1920 to approximately \$350,000,000 in 1924, and it is contemplated that the amount will reach \$500,000,000 in 1925. This enormous increase can be attributed almost entirely to the broadcasting service which began the latter part of 1921. There is little doubt as to the permanency of this branch of the industry. The enjoyment and value of the service is being increased by means of improved apparatus and careful supervision of programs. At the end of this fiscal year we have 571 broadcasting stations, compared with 535 at the end of last year.

There has been a growing desire to increase the power of broadcasting stations. From June 30, 1923, to June 30, 1924, there was an increase of 6 per cent, while during the past fiscal year there has been an increase of 94 per cent. The increases have not met with public favor generally. It may be found desirable to increase the power during the summer and decrease it to some extent during the winter if serious interference develops. This can be determined during the coming winter.

International broadcasting may be successfully accomplished during the coming year. The difference in time between Europe and this country presents some difficulty in the interchange of programs which can be enjoyed simultaneously.

The maintenance of constant frequency or wave-length and the elimination of harmonics and other undesirable emissions must be given more consideration. The use of crystal control in maintaining the proper frequency of broadcasting stations may be found practical and ultimately become necessary to prevent stations interfering with each other.

As a safeguard to life and property our inspection force gives first consideration to determining the reliability of radio apparatus on foreign and American vessels clearing from our ports.

The clearances and inspections during the past fiscal year exceeded those of any previous year.

There were 12,141 clearances and 8,603 inspections during the fiscal year just ended, while for the previous year there were 10,436 clearances and 7,727 inspections.

The inspections developed 316 cases of inefficient apparatus or other defects which would have constituted violations of the law had the vessels sailed under the conditions as found at the time of inspection. The previous year 299 such cases were reported.

Merchant vessels are relying upon radio to an increasing extent. Not only because it is their only method of distant communication and has frequently been the means of saving lives, but it is now coming into extensive use to insure safe navigation. There are at present 128 American ships which have radio compass installations. There were 75 such installations made during the fiscal year just ended.

Considerable progress has been made during the year in developing the transmission of photographs by radio. At present this use of radio may be considered as in the experimental stage. The success thus far achieved apparently justifies the prediction that this new use of radio may be found commercially practicable, and take its place among other important radio developments.

The limitation of existing radio laws would have seriously handicapped the department but for the excellent cooperation received from all of the radio interests. To encourage this spirit of cooperation three conferences have been held during the past three years, and another is to be held this fall. The recommendations of these conferences have been carried out almost to the letter, and have been of great assistance in providing for the orderly operation of the various radio services. Many of these recommendations should be covered by new legislation.

Realizing the difficulties experienced by the radio service of the department, due to the inadequate appropriation provided for this service, the last radio conference recommended a more liberal appropriation. The last Congress did not approve the increase requested by the department; therefore, it will be necessary to renew the request in our estimates for the next fiscal year.

No other country is so fortunate as the United States in having a reserve force of more than 15,000 skilled radio operators constantly training and experimenting with practically all of the most modern developments in radio. They are referred to as amateurs, although a large number of them are expert operators, and some of them have qualifications of radio engineers. Through their existing system of international communication they have an opportunity to promote good will and a better understanding between the young men of the world, which may be more far reaching and beneficial than can at present be realized.

Under authority of the general appropriations act for the Department of Commerce, fiscal year 1925, the personnel and equipment of the international radio accounting section of the Navy Department was transferred to the Department of Commerce. During the past fiscal year 1,784 accounts were handled, and 680 accounts were on hand at the end of the year upon which settlement had not been made. Receipts, including \$5,360 transferred from the Navy, amounted to \$176,125.28. Disbursements to foreign administrations, \$131,666.77. Balance on hand June 30, 1925, \$44,458.51.

ENFORCEMENT OF NAVIGATION LAWS

Administration of the navigation laws has proceeded throughout the year along the usual lines but with increasing results. During the year there were reported to the department for mitigation or remission of penalties 9,544 violations of the navigation laws, an increase of 677 over 1924, with a corresponding increase in the amount of penalties collected. Our inspection service developed a growing compliance with the laws covering life-saving equipment and safe navigation. An average of 9 boats out of 10 inspected are fully equipped. Many of the violations reported are technical, but some of them are of a serious nature. Without constant supervision it is not unlikely that some degree of carelessness would develop, especially on the part of small-vessel owners, with possible consequent loss of life and property. It is a matter of note that preventable loss of life on the water has materially decreased during recent years. This result undoubtedly is due in part, at least, to the improved equipment and navigation, especially of the smaller vessels.

Our five inspection vessels operating along the Atlantic and Gulf coasts during the year made 36,450 inspections and reported 3,232 violations of law. This service has the cooperation of motor-boat owners, publications, and organizations. In addition to this work these vessels, in cooperation with the Internal Revenue Bureau, reported taxes on pleasure vessels on which assessment has been ordered aggregating \$30,655.42; cases investigated and assessment recommended, \$23,150.47; and cases pending investigation, \$129,400, of which it is estimated one-half will be collected. The total revenue produced by this service is about \$118,000, exclusive of fines and penalties, against an appropriation of \$79,615 for its operation. It is a popular and beneficent service, more than self-supporting, and doing much to safeguard life and property.

Under the numbering act of June 7, 1918, there have been recorded in the customhouses as of June 30, 1925, 191,217 vessels, an increase of nearly 7,000 over the previous year. This is a fair index of the extent to which small motor boats are used for pleasure and inland commerce.

SHIPPING COMMISSIONERS

During the year 551,136 officers and men were shipped, reshipped, and discharged before shipping commissioners, as compared with 555,633 for the previous year. The average cost per man for this service was 22 cents. Collectors of customs acting at ports where shipping commissioners' offices have not been established shipped and discharged during the year 53,582 officers and men, as compared with 58,446 officers and men during the previous year. American consuls shipped and discharged 36,389 officers and men.

Of 280,964 officers and men shipped before shipping commissioners 119,135 were native Americans, 41,926 naturalized Americans; 161,061 in all, or 57 per cent. This does not give an entirely accurate idea of the nationality of crews of American vessels leaving the various ports, especially on the Pacific coast, inasmuch as many vessels

manned with a proportion of aliens sign on their crews before consuls in foreign ports for the round voyage.

Last year the bureau compiled from applications filed at the time vessels are first documented a statement of the number of officers and men actually employed on American vessels. These figures are subject to correction as trade, motive power, and rig of such vessels change. The following, however, may be taken as approximately correct: On steam vessels 185,295; on gas vessels, 35,665; on sail vessels, 15,887; and unrigged, 5,229, making a total of 242,076 officers and men, excluding masters, manning the documented vessels of the United States.

PREVENTING OVERCROWDING OF PASSENGER VESSELS

During the fiscal year passengers were counted on 9,275 trips of excursion steamers, the number of passengers aggregating 6,370,788. Of this number, navigation inspectors made 7,326 counts of 3,256,597 passengers. On 459 occasions it was necessary to stop passengers going on excursion boats, the limits of safety having been reached. This involved the safety of 277,327 passengers, as in the absence of the inspectors there would have been an overloading. The reports to the bureau indicate a reasonable supervision of the water-excursion business of the country. This business increased over the previous year. There is always present danger of overcrowding.

PASSENGER ACT OF 1882

During the year 1,257 vessels entered our ports bringing to the United States 187,127 steerage passengers. The law regulating this transportation is comprehensive providing for the health, comfort, and morals of these immigrants. But five violations of the statute were discovered and these were in each instance of a technical nature. In recent years there has been a material improvement in the quarters furnished these passengers.

NAVIGATION RECEIPTS

The receipts from tonnage during the fiscal year amounted to \$1,813,755.66 compared with \$1,713,432.68 from the same source last year. The taxes and also the navigation fees and fines are collected by collectors of customs in the administration of the navigation laws through the Bureau of Navigation. The receipts during the past year compared with those of the previous year and 1917, the last pre-war year, were as follows:

June 30—	Tonnage duties	Navigation fees	Navigation fines	Total
1925.....	\$1,813,755.66	\$216,878.77	\$61,628.34	\$2,092,262.77
1924.....	1,713,432.68	212,825.46	46,167.78	1,972,415.92
1917.....	1,393,743.16	159,868.03	49,962.37	1,603,513.56

The accounts covering these various collections receive administrative examination and check in the Bureau of Navigation in

Washington. These charges are imposed on foreign and American vessels alike and do not represent a discriminatory tax against our merchant marine.

NAVIGATION APPROPRIATIONS

The appropriations for the bureau for the past fiscal year, compared with those for the years ended June 30, 1924 and 1917, were as follows:

June 30—	Bureau	Shipping service	Tonnage adjustment	Counting passengers	Navigation laws	Wireless laws	Total
1925	\$55,140	\$110,600	\$4,500	\$14,000	\$67,915	\$180,278	\$432,433
1924	42,780	110,600	3,760	10,250	75,090	139,200	381,590
1917	37,780	74,425	3,000	18,250	26,500	45,000	204,955

It will be noted that the receipts of collections is about five times the cost of operating the bureau through its direct appropriations.

PUBLICATIONS

Publications of the bureau, comprising the Navigation Laws (quadrennial with an annual pamphlet supplement), List of Merchant Vessels of the United States, Code List of Merchant Vessels, and List of Radio Stations (all annual), and American Documented Seagoing Merchant Vessels of 500 Gross Tons and Over and Radio Service Bulletin (both monthly) are no longer distributed gratuitously, but are for sale by the Superintendent of Documents, Government Printing Office, Washington, D. C.

The appendixes and statistical tables which have heretofore followed will be published in Merchant Marine Statistics.

Very truly yours,

D. B. CARSON,
Commissioner of Navigation.

STEAMBOAT INSPECTION SERVICE

DEPARTMENT OF COMMERCE,
STEAMBOAT INSPECTION SERVICE,
Washington, July 1, 1925.

HON. HERBERT HOOVER,
Secretary of Commerce.

DEAR MR. SECRETARY: In response to your request I furnish the following condensed report upon the work of the bureau during the past year:

This service exists primarily for the purpose of securing safety on inspected vessels of the American merchant marine, and it is a pleasure to be able to say that during the past fiscal year there has been no great accident or disaster.

Though we have done during the past year more business than in the preceding one, we have expended actually \$13,000 less. The effort that has been made this year to economize is not a new one because it will be recalled that on April 18, 1924, the local inspection districts of Apalachicola, Fla., and Burlington, Vt., were abolished, and previous to that time they were allowed to remain vacant pending congressional action. The supervising inspectorship of the seventh district with headquarters at Pittsburgh, Pa., was also discontinued in 1921, and while this position has not yet been abolished by Congress, it is to be pointed out that legislation looking to this end is still pending. This has resulted in an annual saving of \$13,450.

The work of standardizing examination questions has not yet been completed because of the pressure of other work. It is the intention of the bureau to complete this work as soon as possible.

INCLINING TESTS

The work of inclining vessels is done by the traveling inspectors of this service. This work has increased to such an extent that at times the bureau has, in a sense, been put upon the defensive in getting this work done on time. There is no more important activity to-day in the Steamboat Inspection Service than the inclining of vessels, and that being the fact, there has been no instance where there has been any delay in the certification of a ship because of a stability test. In any instance where an operator has felt that a different conclusion should have been reached by the bureau, a fair and impartial hearing has been given, and in some instances the bureau has changed its original findings based upon additional information that was furnished, all of which is in the interest of good business.

The traveling inspectors have also been of great assistance to the bureau in keeping in touch with every activity of the entire service, and by having them stationed at Washington, the Supervising Inspector General has been able to use them in conducting investiga-

tions of complaints that have come to the central office, thus enabling the bureau to have important and complete information at first hand.

LEGISLATION

Reference has been made in previous annual reports to the necessity for having sections 4433 and 4418, Revised Statutes, in regard to the working and hydrostatic pressures of boilers amended so as to enable this service to make modern the rules and regulations covering these matters. This legislation is still desirable, and it is hoped that Congress will take action upon the matter in the near future.

Section 4404, Revised Statutes, should be amended so as to include the supervising inspectors under the classified civil service.

RECLASSIFICATION

Up to the present time reclassification has only been made effective in the District of Columbia. There has been what has been termed a readjustment of the salaries of the field service, and while that has given temporary relief in a sense, it has not given the full and permanent relief desired. The payment of a proper salary is just as economical a thing as having the proper number of personnel, because there is absolutely no economy in the employment of cheap men. It would be better to employ high-priced men and fewer of them. By this it is not meant to say that the field employees of this service are inferior, but this service does desire to attract to its ranks men of the very highest caliber and best experience, which it will increasingly be unable to do unless proper salaries are paid. In this service at the present time are very able men, and while the question may be asked why, if these men are so able and can obtain better salaries outside of the Government, they do not take advantage of their opportunities, the answer can readily be given that they accept positions in this service at lower salaries in order to be at home with their families, which is something that will not appeal to a man when he is younger and who will look to the sea for employment, until in later years when he will also come to the Government for employment. It is the desire of this service to attract to its employment young active men with good experience and this can only be done by the payment of salaries that are commensurate with training and ability of desirable men.

PERSONNEL

The following positions were embraced in the Steamboat Inspection Service at the close of business on June 30, 1925:

At Washington, D. C.:	
Supervising Inspector General.....	1
Deputy Supervising Inspector General (who is Acting Supervisor Inspector General in the absence of that officer).....	1
Traveling inspectors.....	3
Clerks.....	11
Messenger.....	1
In the service at large:	
Supervising inspectors.....	10
Local inspectors of hulls.....	46
Local inspectors of boilers.....	46

In the service at large—Continued.

Assistant inspectors of hulls.....	75
Assistant inspector of boilers.....	75
Clerks to boards of local inspectors.....	95
Total.....	344

On October 1, 1924, the headquarters of the traveling inspector at San Francisco, Calif., and the traveling inspector at Cleveland, Ohio, were changed to Washington.

STATISTICS

The force inspected and certificated 7,411 vessels, with a total gross tonnage of 14,544,153, of which 7,078 were domestic vessels, with a total gross tonnage of 11,256,634, and 333 were foreign passenger steam vessels, with a total gross tonnage of 3,287,519. Of the domestic vessels there were 5,620 steam vessels, 923 motor vessels, 21 passenger barges, and 514 seagoing barges. There was a decrease of 149 in the total number of vessels inspected, and a decrease of 57,450 in the total gross tonnage of vessels inspected as compared with the previous fiscal year. There were 887 cargo vessels examined to carry persons in addition to crew under the act of Congress approved June 5, 1920. Letters of approval of designs of boilers, engines, and other operating machinery were granted to 22 steam vessels, with a total gross tonnage of 579. There were inspected for the United States Government 58 hulls of vessels and 2,097 boilers. There were 2,549 reinspections of steam vessels, motor vessels, and barges.

Licenses were issued to 23,670 officers of all grades. There were examined for visual defects 7,276 applicants for license, of whom 19 were found color blind or with other visual defects and rejected. Certificates of service were issued to 9,580 able seamen, and 586 were rejected. Certificates of efficiency were issued to 9,461 lifeboat men, and 5,367 were rejected.

Steel plates for the construction of marine boilers to the number of 2,560 were inspected at the mills, and a large amount of other boiler material was inspected. There were examined and tested 131,832 new life preservers, of which 1,704 were rejected. There were inspected 9,966 new ring life buoys, of which 125 were rejected. There were inspected at factories 200 new lifeboats, of which 1 was rejected. There were inspected at factories 92 new life rafts, all of which passed.

The total number of accidents resulting in loss of life was 173. The total number of lives lost was 310, of which 59 were passengers. Of the lives lost, 152 were from suicide, accidental drowning, and other similar causes, leaving a loss of 158 as fairly chargeable to accidents, collisions, foundering, etc. There was an increase of 13 in the number of lives lost as compared with the previous fiscal year.

Passengers to the number of 344,092,530 were carried on vessels required by law to make report of the number of passengers carried. Dividing this number by 59, the total number of passengers lost, shows that 5,832,076 passengers were carried for each passenger lost. The number of lives directly saved by means of the life-saving appliances required by law was 788.

Very truly yours,

GEO. UHLER,
Supervising Inspector General.

PATENT OFFICE

DEPARTMENT OF COMMERCE,
PATENT OFFICE,
Washington, July 1, 1925.

HON. HERBERT HOOVER,
Secretary of Commerce.

DEAR MR. SECRETARY: The Patent Office was, by Executive order, transferred to the Department of Commerce on April 1, 1925, after having been in the Department of Interior for 76 years.

The Patent Office has been a beehive of industry during the year just closed. Except for the "peak" years 1921 and 1922, more applications were received than in any year in the history of the office and more money received as fees than in either of the two peak years just referred to. Patent applications increased from 79,689 in 1924 to 82,213 in 1925. Applications of all kinds increased from 99,724 to 103,705. The largest amount of fees ever received in any previous year totaled \$3,042,272.22. During the year just closed the receipts rose to \$3,271,259.89. The "output" increased from a total issue of 59,853 patents, designs, trade-marks, etc., in 1924 to 64,704 in 1925.

Notwithstanding the tremendous increase in work, the number of applications awaiting action has been reduced as follows:

	Patents	Designs	Trade-marks	Total
The "peak," September, 1923.....	74,256	2,113	3,341	79,710
July 1, 1924.....	60,334	323	1,914	62,571
July 1, 1925.....	44,556	295	1,463	46,314

While during the year there was an apparent decrease of applications awaiting action of 15,778, the relative decrease was much greater, since the office received 4,000 more new applications than during the preceding year and also received about 30,000 more amendments to old applications than in the preceding year.

The average time in which an application is held awaiting official action has been reduced from 5 months to 3 months in new cases and from 3.4 months to 2.3 months in amended cases. This gain is also shown by the following table:

1923	1924	1925
No division under 2 months.	1 under 2 months.	4 under 2 months.
None under 3 months.	1 under 3 months.	13 under 3 months.
None under 4 months.	2 under 4 months.	35 under 4 months.
None under 5 months.	8 under 5 months.	46 under 5 months.
49 divisions over 5 months.	40 over 5 months.	7 over 5 months.
44 over 6 months.	26 over 6 months.	None over 6 months.
42 over 7 months.	9 over 7 months.	
39 over 8 months.	2 over 8 months.	
28 over 9 months.		
1 over 10 months.		

RECOMMENDATIONS

A new building, equipped to meet the present needs of the Patent Office, or a remodeling and enlarging of the present building is an absolute necessity.

During the year the examining corps suffered a loss of 87 members by resignation, retirement, or death. Appropriations should be increased so that the technical force may be paid salaries as high as the average, rather than below the average, as they now are. As an example, of the 60 principal and law examiners, only 1 exceeds the "average" and all but 3 receive no more than the second step of the 6-salary levels, although all have been in the office at least 20 years.

Congress has provided a temporary force consisting of 3 principal and 97 junior examiners. It is urged that the three principals be made permanent and that an appropriation of \$60,000 be made for the coming year in order to make it possible to retain the trained temporary examiners a few months so that they may be appointed in the permanent force as resignations occur therein, instead of bringing in untrained men.

Now that the public search room has been equipped with new steel stacks, it is urged that an appropriation of \$25,000 be made to make it possible to check up the 2,000,000 patents in the only place in the United States where the general public can make searches affecting patent matters.

It is also recommended that appeals should be shortened by abolishing appeals to the commissioner in "interference" cases, so that such appeals will go direct from the examiners in chief to the Court of Appeals of the District of Columbia.

The work of replacing wooden shelves to house the millions of copies of patents has been progressing rapidly and should be continued until all the wooden shelves are replaced. This should also be done with respect to the patented files.

Very truly yours,

THOMAS E. ROBERTSON,
Commissioner.

INTER AMERICAN HIGH COMMISSION

INTER AMERICAN HIGH COMMISSION,
Washington, July 1, 1925.

Hon. HERBERT HOOVER, Chairman,
United States Section, Inter American High Commission.

MY DEAR MR. CHAIRMAN: During the first part of the fiscal year 1924-25 the activities of the commission were chiefly concentrated upon the preparation for the First Pan American Conference on the Uniformity of Specifications, held at Lima, Peru, from December 23, 1924, to January 6, 1925.

The commission was charged with the drawing up of the program, which necessitated consultation with the Pan American Union, with other departments of the Government, and with the several national sections of the commission in Latin American countries. The commission also drafted the regulations governing the procedure at the conference. Technical preparation, including the issue of advance reports and the study of the technical problems to be discussed at the conference, was also performed by the commission.

The conference recommended that the American nations enter into a convention looking to the establishment of common standards of nomenclature, uniform quality bases, simplified classifications, and standard specifications for raw materials and industrial products. In order to maintain inter-American communication on this subject and to secure the establishment of inter-American standards, the conference recommended that

The Inter American High Commission, through the national section of each country and the central executive council (be) charged with the receiving and distributing of information relating to the work done in each country; the commission will direct or perform such studies as it may believe advisable, will draw up proposals, and will take all necessary measures within its sphere of action to promote the establishment of inter-American standards.

The commission was also instructed to study and draft the convention resulting from this work.

In connection with the uniformity of weights and measures, the commission was charged with the appointment of a committee upon which all American countries are to be represented, to study and report at the next conference.

Since the conference the commission has been assisted by the special Department of Commerce committee on standardization in all of these matters.

As a result of the commission's activities there have been established in some countries bureaus similar in organization and purpose to the United States Bureau of Standards. This office is rendering every assistance possible to these newly established bureaus, especially in the furnishing of information concerning the functions and methods of the United States Bureau of Standards.

In accordance with the instructions of the Fifth International Conference, the commission has made preparations for the Pan American Congress on Highways to be held in Buenos Aires, October 3 to 13, 1925.

The commission has assisted in drafting the program and regulations governing the proceedings at the congress, and has endeavored to secure proper representation of the other American countries at the congress. This office has also helped the United States delegation in the translation of papers and in the handling of other details.

The commission has continued to procure the effectuation of the proposals relating to the subjects included in its program. During the last year, it has issued the following pamphlets:

1. Preparation of Hides and Skins in the United States.
2. The Inter American High Commission—Its Rôle in the Economic Studies of the Continent.
3. Report Regarding the Laws Governing Stock Corporations on the American Continent. (Complete report to be in five volumes.)
4. Comparison of American Legislation on Bills of Exchange and Promissory Notes.
5. Report on First Pan American Conference on Uniformity of Specifications.

The commission has continued its efforts to obtain acceptance of the various recommendations and resolutions passed by the Fifth International Conference of American States held at Santiago, Chile, in 1923.

Since the last report the convention on trade-marks has been ratified by Brazil, Cuba, Guatemala, Paraguay, and the United States, while the President of Chile recommended its ratification at the opening of the Chilean Congress. The convention for uniformity of classification of customs statistics has been ratified by Brazil, Cuba, Guatemala, Costa Rica, and Paraguay, while the President of Chile recommended this convention in his message at the opening of the last Congress. The convention providing for the publicity of customs documents has been ratified by Guatemala, Cuba, and Paraguay; the ratification of this convention, too, was recommended by the President of Chile in his annual message to Congress. The commercial travelers' convention was ratified by Peru on June 15, 1924. It was approved by the Congress of Costa Rica on June 3, 1924, and its ratification was recommended by the President of Chile at the opening of Congress. In Paraguay the Minister of Finance is conferring with various commercial bodies in that country with reference to this convention. In Guatemala the Director of the General Bureau of Industries and Commerce is now drawing up the regulations in accordance with which the convention is to operate in that country. In Panama the treasury department is at present working upon the procedure and regulations necessary to make the convention effective. In the Dominican Republic the convention is now before the Dominican Government for final action.

Respectfully,

GUILLERMO A. SHERWELL, *Secretary.*



